Dyslexia: An Investigation of Teacher Awareness in Mainstream High Schools

by

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Declaration

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I declare that **DYSLEXIA: AN INVESTIGATION OF TEACHER AWARENESS IN MAINSTREAM HIGH SCHOOLS IN THE WESTERN CAPE** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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Degree: Master of Arts

Subject: Psychology

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Summary

The main aim of this study was to assess teachers' awareness levels of dyslexia, their perceptions of their ability to identify and manage dyslexia, and their perceptions of the adequacy of their pre-service and in-service training in dyslexia. The sample comprised teachers at 16 mainstream high schools in the Western Cape. A Likert type scale questionnaire was used to collect data that were analysed by means of a sign test of difference and a Kruskal-Wallis test of variance. The results indicated that teachers had adequate knowledge of dyslexia, believed they are able to identify and manage dyslexia, and believed that they received little or no pre-service and in-service training in dyslexia. The main conclusion that can be drawn is that teachers need on-going adequate pre-service and in-service training in the field of dyslexia.

Key Terms: Dyslexia; Special Needs Education; Reading Disability; Learning Disability; Teacher Awareness; High School Teachers; Mainstream Schools; Pre-Service Training; In-Service Training

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Dedication

This thesis is dedicated to all teachers trying to make a difference in the lives of learners who struggle with dyslexia.

List of Abbreviations

ADD	Attention Deficit Disorder
ADHD	Attention Deficit and Hyperactivity Disorder
aMRI	anatomical Magnetic Resonance Imaging
ANC	African National Congress
APA	American Psychological Association
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders IV
IDA	International Dyslexia Association
IQ	Intelligence Quotient
MSI	Magnetic Source Imaging
NACHC	National Advisory Committee on Handicapped Children
NJCLD	National Joint Committee for Learning Disabilities
SEN	Special Educational Needs

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Chapter 1: Introduction and Aims of the Study

Rose (2009) maintains that "the quality of an education system cannot exceed the quality of its teachers and this truth applies to the assessment and teaching of learners of any age who are dyslexic." (p.15). In other words, for learners to be successful, especially those who have dyslexia[1], teachers who are knowledgeable about what they are doing and why they are doing it, are paramount (Rose, 2009). However, according to Mastropieri and Scruggs (2001) practicing inclusive education[2] at the secondary level represents a huge challenge for teachers. The global trend to provide inclusive education in mainstream public schools means that teachers are constantly bombarded with jargon such as 'special needs', 'inclusion' and 'differentiation' and a range of conditions such as dyslexia and attention deficit and hyperactivity disorder (ADHD) to name a few. Furthermore, they are expected to have knowledge and expertise in these areas as they undoubtedly have to teach, at some stage of their careers, learners who fall into these categories. Unfortunately according to Hayes (2000), teachers by and large do not have the skills necessary to assist these learners. In support of this need, recent literature reviews call for more adequate training of teachers and significant others in the field of dyslexia (Rose, 2009).

Awareness of the Problem

My awareness of this topic arose from two areas in my life. First, as a teacher in mainstream[3] schooling, where I encounter many children who struggle to cope with the school curriculum due to their possible or suspected dyslexia. Many of them (and their parents) are unaware of the fact that they may have a learning difficulty. They endure twelve years of school believing that there is 'something wrong with them' because people think

[1] Dyslexia: a learning difficulty that primarily affects the skills involved in accurate and fluent word reading and spelling (Dyslexia Action, n.d.).
[2] Inclusive education: Education for all children including those with disabilities and/or barriers to learning.
[3] Mainstream: regular (ordinary)

they are ‘stupid’ or ‘lazy’ or both. In my experience, dyslexics who do succeed academically, do so because of early identification and intervention, which is usually initiated by the primary school teacher.

Second, my awareness of the phenomenon stems from being a mother of a child with dyslexia, and I am well aware of the struggles of living with this disability and the impact that a lack of early identification and intervention has on academic achievement. The role of the teacher cannot be under-estimated in the success of the learner with dyslexia.

Rationale for Study

According to Lomofsky and Lazarus (2001), the provision of inclusive education is a moral issue of human rights and values as set out in the Salamanca Statement (UNESCO, 1994). Many countries, including South Africa, heeded this call to provide inclusive education in schools for all children. However, implementation has been very slow (especially in previously disadvantaged schools[4]), even though South Africa has set policies in place to address the issue of actual implementation of policies. Many barriers in the South African school system hamper the progress of providing inclusive education (Lomofsky & Lazarus, 2001). In many instances these are unique to the South African context (i.e. the legacy of Apartheid) and so compound the issue of providing inclusive education in ways that other countries may not experience. These barriers include socio-economic factors; discriminatory negative attitudes; inflexible curriculum; language and communication blocks; inaccessible and unsafe learning environments; and exposure to high levels of violence and trauma (Lomofsky & Lazarus, 2001). Because of these and other contributing factors, South Africa has a large number of learners who experience learning difficulties (Department of Basic Education, 2010). The challenge is to ensure that we have a teaching force that is well-

[4] Previously disadvantaged schools: A South African term that refers to black, Indian and coloured schools that received less funding from the Apartheid government compared to white schools.

equipped to implement the necessary inclusive policies as set out by the government.

Research shows that teachers generally express some level of concern because they feel they do not have adequate knowledge and training in order to meet the needs of learners with special needs (Hayes, 2000). In fact, some teachers tend to attribute the failure of their learners to their own lack of knowledge and training (Kataoka, Van Kraayenoord & Elkins, 2004). Although most studies relating to learning disabilities[5] have been conducted in other countries, there is no reason to believe that the situation is any different in South Africa. First, many general teacher-training programmes do not offer modules or electives that cover special needs education in depth. Second, teachers do not empower themselves in this area, and third, schools do not provide enough in-service training for already qualified and experienced teachers (Robuck, 2007). According to Nkabinde (1993), the training of regular teachers is vital to the educational success of the learning-disabled child. This notion was supported in a study conducted by Karande, Mahajan, and Kulkarni (2009), where learners indicated that they made progress in lessons and subjects where teachers were knowledgeable about their learning difficulties.

Teacher awareness refers to the recognition and understanding of a phenomenon by the teacher within the educational system. One can reasonably deduce that if teacher awareness and understanding of special needs education is poor, their level of understanding of dyslexia is even lower, since it is a sub-division in the field of learning disabilities. Research shows that dyslexia is a confusing term for many teachers as they are often unsure about its definition and generally struggle to tell the difference between dyslexic learners and slow learners *(*Wadlington, Jacob & Bailey, 1996). According to Wadlington and Wadlington (2005), teachers frequently have misconceptions about dyslexia. Their report showed that teachers' lack of awareness and misconceptions have negative effects for the dyslexia

[5] Learning disability: A generic term for a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning or mathematical abilities (American Speech-Language-Hearing Association, n.d.).

sufferer in the classroom. According to Wadlington and Wadlington (2005), non-recognition of dyslexia and delayed assistance to the learner compounds the problem even further. This lack of awareness and understanding of dyslexia can be attributed to the same factors responsible for the lack of awareness in the area of special needs education as a whole.

The current study will contribute to this area of special needs education by (a) assessing teacher awareness of dyslexia in mainstream high school settings in the Western Cape in particular and the possible reasons for lack of awareness and (b) recommending practical suggestions for improving awareness amongst South African teachers.

Descriptive Statement of Research Problem

In general the level of teacher awareness of special needs education and in particular, dyslexia, has been relatively under-researched (Robuck, 2007). It is therefore imperative that more research be conducted in this regard as the impact of teacher awareness of dyslexia is paramount to the success of learners. The research findings presented in the literature review (see Chapters 2 - 4) are mainly based on findings from studies conducted in other countries. The present study aimed to assess the level and depth of teacher training, and in-service training, of special needs education and dyslexia.

The following research problems and research questions were therefore addressed:

Research Problem

Do South African teachers have ‘adequate’ knowledge of dyslexia, and do they believe they have received adequate training in identifying and managing dyslexia in a mainstream high school setting?

Research Questions

- How knowledgeable are South African teachers about dyslexia?
- Do teachers believe they are able to identify dyslexic learners in their classrooms?

- Do teachers believe they are able to manage dyslexic learners in their classrooms?
- Do teachers believe South African tertiary institutions provide adequate pre-service training in order to identify and manage dyslexia?
- Do teachers believe South African state schools provide adequate in-service training in order to identify and manage dyslexia?

The aim of this study was to find answers to these questions by:

- Describing teachers' level of knowledge of dyslexia
- Assessing teachers' perceptions of their ability in identifying dyslexia in their classrooms
- Assessing teachers' perceptions of their ability in managing dyslexia in their classrooms
- Assessing teachers' perceptions of the adequacy of pre-service training of dyslexia received
- Assessing teachers' perceptions of the adequacy of in-service training of dyslexia received
- Recommending to schools where there is a lack of awareness

Research Approach

The research was conducted via a literature study and empirical investigation.

Literature study. A literature study was conducted to evaluate the extent to which the research topic was previously researched, and to find a 'gap' in the literature to justify the research problem. Both primary and secondary sources were consulted for the purposes of research. Primary sources are considered sources where the author's original work is based on his or her own observations or experiences. In this study peer-reviewed journal articles were used as primary sources. Secondary sources are sources that are derived from someone

else's work. Most of the secondary sources used in this study were drawn from books.

Empirical study. A quantitative research design was used in this study. A questionnaire was the instrument of measurement and purposive sampling was deemed the most appropriate sampling method. Teachers, from schools in the Western Cape, who opted to complete the questionnaire, comprised the sample. The data were analysed using professional statistical software.

The report is presented as follows:

Chapter 2: Inclusive Education. Chapter 2 provides an in-depth review of the literature that addresses inclusion internationally and nationally.

Chapter 3: Learning Disabilities. Chapter 3 examines the concept of learning disabilities, including definitions and types of learning disabilities. It also provides an in-depth review of dyslexia; including the definitions, causes and prevalence.

Chapter 4: Teacher Awareness of Dyslexia. Chapter 4 evaluates the state of teacher awareness of dyslexia in mainstream high schools internationally as well as South Africa.

Chapter 5: Preparations for the Empirical Study. Chapter 5 outlines the preparations for the empirical research in which the research design, nature of the questionnaire, ethical considerations and details of the pilot study are discussed.

Chapter 6: The Main Empirical Study. Chapter 6 presents a detailed presentation of the main empirical study. The sample, sampling technique, and data collection procedure are described. A brief outline of the data analysis is presented.

Chapter 7: Results and Discussion: Testing the Hypothesis. Chapter 7 details the results of the empirical study and a discussion of the results.

Chapter 8: Conclusions. Chapter 8 discusses the study's limitations, offers suggestions for future research and makes recommendations for practical steps to increase teacher awareness.

Summary

This chapter outlined the aims and rationale of the study, research problem and research approach.

The next chapter provides a literature review of inclusive education policies and implementation internationally and in South Africa.

Chapter 2: Inclusive Education

Chapter 2 reviews the literature on the state of inclusive education globally and in South Africa.

Inclusive education can be defined as the inclusion of 'disabled' children into mainstream schools (Forlin & Sin, 2010). It aims to serve all children especially those with special educational needs[6] (UNESCO, 1994). Peters (2003) states that a basic tenet of inclusive education or inclusion is that all children are given the opportunity to be educated together. Indeed, "Inclusion and participation are essential to human dignity and to the enjoyment and exercise of human rights." (UNESCO, 1994, p.11). However, according to Mastropieri and Scruggs (2001), "Inclusion on the secondary level…represents a significant challenge for teachers." (p.265). The government's aim to provide inclusive education means that teachers are constantly bombarded with jargon such as special needs, inclusion, differentiation, dyslexia and attention deficit and hyperactivity disorder (ADHD). As previously mentioned, parents, learners and other stakeholders expect them to have knowledge and expertise in these areas as they undoubtedly have or will have learners who struggle with such disabilities or difficulties. Many current experienced teachers have had very little or no training in the area of special needs, either as student teachers or through continuing professional development (Florian & Rouse, 2009). Those who are knowledgeable (and demonstrate positive attitudes) about special needs education have empowered themselves by means of in-service training either on a voluntary basis or through workshops/seminars arranged by their respective schools (Chong, Forlin & Au, 2007).

Wadlington et al. (1996) reported that although an estimated 10-15% of the general population in the United States has dyslexia, the term is a confusing term for most teachers. Comments borne out of a lack of awareness, such as "dyslexia is when learners reverse

[6] In this study the term 'special educational needs' refers to all disabilities or learning difficulties

letters" or "does it even exist?" are not uncommon. According to the findings of a study conducted by Wadlington and Wadlington (2005), most of the participants (student teachers and teachers) had many misconceptions (such as dyslexia is not hereditary) about dyslexia. Surely misconceptions have negative implications for the learner with dyslexia? For example, the teacher might not be able to provide the necessary academic and/or emotional support to the learner if he or she does not fully understand the nature of the disorder.

Ideology of Inclusive Education

The widespread move towards inclusive education occurred both at a philosophical and ideological level (Florian & Rouse, 2009). In the late 19th century and early 20th century, there was widespread classification and segregation of children with social problems and different types of disabilities (Mattson & Roll-Pettersson, 2007). However, since the 1960s and 1970s we have seen a greater universal awareness of human rights, social justice and equal opportunities (Chong et al., 2007). Greater notions of equality, equity and social inclusion gained prominence. According to Links (2009), changes in world perspectives often cause and affect changes in educational policies. Thus, with regard to the education of disabled learners, the last thirty years have seen a considerable change in moving from segregated educational settings to integrated (inclusive) educational settings (Chong et al., 2007).

In recent years, many countries have adopted policies that encourage more schools to become inclusive (Florian & Rouse, 2009). In 1994, the Salamanca Statement on Principles, Policy and Practice in Special Needs Education, was adopted at the World Conference on Special Needs Education in Salamanca, Spain and was signed by 92 countries, including South Africa. These countries reaffirmed their previous commitments to ensuring that all their nations' children would receive access to education, irrespective of any barriers to

learning[7] they might experience. The commitment was in line with the policy commitment of the United Nation's World Declaration on Education for All. One of the United Nation's Millennium Goals, 'Education for All' was designed so that all children worldwide could have access to basic education by 2015 (Florian & Rouse, 2009). The Salamanca Statement also outlines that schools should aim to accommodate all children irrespective of their physical, social, emotional or intellectual status. As a result of the contents of the Salamanca statement schools were challenged to find ways of educating all children successfully. This includes offering inclusive schooling, which was seen as the most effective way of bridging the gap between children with special needs and their non-disabled peers. The statement suggests that children should only be enrolled at special schools when their needs cannot be met in a mainstream school, if, "owing to the particular communication needs of deaf and deaf/blind persons, their education may be more suitably provided in special schools or special classes and units in mainstream schools." (UNESCO, 1994, p.18). Countries that choose to establish and operate special schools should do so with mainstream schools in mind; in other words, special schools can serve as a training facility and resource centre for teachers at mainstream schools (UNESCO, 1994).

All children deserve an equal opportunity to the same education as their non-disabled peers. But Chong et al. (2007) point out that inclusion does not only mean educating children with special needs *alongside* their peers, but also providing the *appropriate* education for disabled children. An inclusive model of education from a world perspective includes concepts such as learner-centeredness, shared success and human rights (Links, 2009).

[7] Barriers to learning: Difficulties that arise within the education system as a whole, the learning site and/or within the learner him/herself which prevent both the system and the learner needs from being met.

Establishing an Inclusive Education System

According to Peters (2003), who prepared a report for the Disability Group of the World Bank, establishing a truly inclusive educational system is an extremely complex process. The implementation of inclusive education in different countries depends on the aims and motives of that particular government. Because inclusive education is linked to issues such as healthcare, economic policies, labour markets, social welfare, parental choice and, consumer satisfaction, governments provide varying degrees of inclusive education deemed to be appropriate for that particular society. Research findings highlight some key lessons to be learnt from different countries around the world as to what constitutes good practice in special needs education, and the barriers or obstacles to establishing an inclusive education system (Peters, 2003). Studies from countries (e.g. Scotland and England) that successfully establish inclusive education revealed that vital issues include effective pre-service and on-going in-service teacher training, whole school reform, early identification and remediation of learners and converting special needs schools into resource schools (Peters, 2003). However, these and other countries who report barriers to establishing inclusive education, cite issues such as proper allocation and distribution of funds and meeting the needs of Special Educational Needs (SEN) learners in the secondary school.

It is worthwhile considering in detail some of the main factors in creating and maintaining a successful inclusive educational system. One of these, as outlined by UNESCO (1994), is the formation of appropriate legislation and policy at the national level that must recognise the principles of equality and equal access to education for all. Simultaneously, complementary policies in the fields of healthcare and social services should be developed to strengthen policies on inclusive education. Important aspects of such legislation must ensure that all children have access to their neighbourhood school, and ‘mainstreaming’ of schools should be integral in creating an inclusive system. Together with policy-making, school

factors such as a flexible curriculum and assessment, school management and examples of good practice were also identified as integral to successful inclusive practices (UNESCO, 1994). Peters (2003) suggested that motivated and involved school leadership, multi-disciplinary planning by all stakeholders, parental involvement, and continued training of significant educational personnel are all central to the creation of an inclusive school.

Appropriate preparation of significant educational personnel stands out as an important factor in promoting progress towards inclusivity (UNESCO, 1994). Researchers Florian and Rouse (2009) and Peters (2003) agreed that the training of teachers and other key educational personnel is of paramount importance to successful inclusion. Peters (2003) stated that teachers should receive training that enhances their skills in areas of pedagogy and curriculum. Training should also be on-going and intensive. Since human resources are the most effective and expensive educational resource, it goes without saying that the best policies will not have any meaning if not implemented by suitably qualified and/or trained personnel.

Last, another key factor to successful inclusion is that of external support services (UNESCO, 1994). School management, teachers and learners need continued support from outside role-players in their quest towards creating a truly inclusive environment. These external role-players include non-governmental organisations, school district management teams, learning support teachers and educational psychologists. However, all of these factors cannot be realised without the necessary financial funding it takes for successful inclusion.

The discussion above is based on the ideals of what inclusion ‘should look like’. The reality, however, is rather different. What is clear from studies is that although most countries have progressive policies in place, implementation of such policies is happening at a slow pace. According to Florian and Rouse (2009), many countries have accepted the

philosophical and ideological arguments in favour of inclusive education, but implementation of adopted policies has been slow, top-down and problematic.

Status of inclusive education in developed countries. Most studies conducted in the field of inclusive education have been conducted in the West, with a few in the developing world. Studies carried out in well-resourced school systems, such as in Scotland and England, assessed the state of inclusion in schools and found the following barriers to effective inclusion: Lack of adequate teacher training, irrelevant curricula and assessment strategies and unrealistic teacher expectations (Florian & Rouse, 2009).

Researchers report that overcoming these obstacles presents huge challenges to governments worldwide (Florian & Rouse, 2009). The same studies presented recommendations for how teachers, school managers, communities and governments could alleviate some of the challenges surrounding effective inclusion. These included: Experience of working with children who have disabilities, effective teacher training, and a whole school approach to ensuring inclusivity (Forlin & Sin, 2010).

According to Paterson (2007), the lack of special needs pre-service and in-service training of teachers is one of the major barriers to successful inclusion. Successful inclusive practices can only be realised with the commitment and co-operation of those directly involved, in other words teachers, school management, and educational authorities. The lack of commitment and co-operation stems from inappropriate teaching and assessment methods, inflexible curricula, and most commonly, lack of teacher preparation and support. Almost all studies highlighted one common area for improvement, that of teacher training and teacher preparation (Fletcher et al., 2010). In addition to this, Forlin and Sin (2010) reported that primary school teachers tended to be more accommodating of children with disabilities than high school teachers; and female teachers more so than male teachers. A possible reason for primary school teachers being more accommodating of children with disabilities is that

teachers may be more sympathetic to the needs of younger children as opposed to teenagers; and a possible reason for female teachers being more sympathetic towards children with disabilities could be attributed to the naturally caring nature of women compared to men.

According to findings of studies conducted in developed countries, other factors that impede support for inclusion are lack of financial resources and other educational policies that contradict inclusion. Results- driven practices or policies are examples of policies that contradict inclusion (Florian & Rouse, 2009). Schools that administer entrance examinations to test aptitude in a particular area are guilty of excluding learners who do not possess the required skill levels needed for acceptance. These kinds of schools are selective and thus do not practice inclusivity.

Mastropieri and Scruggs (2001) suggest that those involved in education should strive for an inclusive environment where administrative support, support from special needs teams and effective teaching skills are the order of the day.

Status of inclusive education in developing countries. There are many similarities amongst developing and developed countries and/or territories with regard to policy design and creation, but also many differences with regard to implementation of such policies. According to Walker (2010), laws governing special educational needs in Romania are comparable to those in many economically advanced countries. The finding of Walker's (2010) study is supported by other researchers who conducted studies on the state of special needs education in other developing nations (Raver & Kolchenko, 2007; Thirumuthy & Jayaramam, 2007). There are of course exceptions: Zimbabwe for instance has no specific legislation for special needs education, however there is a Disabilities Act that requires education at local schools to be accessible to all children with disabilities (Mutepfa, Mpofu & Chataika (2007). Such is also the case in the Palestinian Authority, West Bank and Gaza, where the provision of special needs education is in its early stages. No specific policy exits

but non-governmental organisations seek to ensure that the needs of children with disabilities are met (Gumpel & Awartani, 2003). Raver and Kolchenko (2007) also report that the Ukraine has excellent disabilities rights laws but the implementation of the laws is largely ignored.

As previously mentioned, the challenges facing developing countries lie not in the creation and design of policies around special needs but rather in their implementation. One of the key factors for effective and successful implementation is that of funding and resources. As pointed out by Gumpel and Awartani (2003), developing countries struggle with crippling economies, huge debts and a lack of basic resources. Many of these countries have the added factor of cultural and traditional obstacles. For example, many parents in rural Palestine refuse to have their children tested for learning disabilities as a diagnosis may lead to negative outcomes such as stigmatisation associated with disability or decreased probability of marriage for siblings without a disability (Gumpel & Awartani, 2003).

Another major obstacle to successful inclusion in developing countries is lack of teacher awareness. According to Kuyini and Desai (2008), studies conducted in Ghana reported that mainstream teachers lack knowledge about inclusion and children with disabilities. Teachers also have the added burden of teaching very large classes; a factor that might not be a major obstacle in developed countries. The teacher: pupil ratio that determines class size is generally much lower in developed countries due to increased funding in such countries. The Ghanian government has been proactive however, by adopting a ‘train-the-trainer’ approach to inclusion whereby teachers who received initial training train other teachers (Kuyini & Desai, 2008). Fletcher et al. (2010) examined general attitudes towards inclusion and implementation of national policy in Chile. The findings of the study revealed that teachers felt inadequate about their ability to meet the needs of their learners with disabilities, and they felt that the lack of financial and human resources were some of the key

challenges they faced. The researchers also maintained that their findings reflected attitudes shared by teachers in other Latin American countries. Mexican teachers, while commending their government's creation of inclusive policies expressed disappointment that no evaluative follow-up existed to assess the state of successful implementation (Fletcher et al., 2010).

History of Special Education in South Africa

Prior to colonisation, black children in South Africa essentially received an indigenous education. They were taught life skills that were beneficial and advantageous to the well-being of the larger community in which they lived. The entire community was responsible for the learning environment, and educational milestones were achieved by accomplishing developmental rites of passage. This type of education can still be found in some rural communities today (Gwalla-Gisi, Nkabinde & Rodriguez, 1998). After colonisation, they were 'introduced' to Western education that was later to become known as Bantu education. The introduction of Bantu education resulted in the decline of indigenous education, since the purpose of Bantu education was to 'civilise' and 'evangilise' the black population (Gwalla-Gisi et al., 1998). Bantu education was also to ensure the black population's acceptance of racial and ethnic separation and a sense of superiority on the part of the white population (Gwalla-Gisi et al., 1998).

Education in South Africa was based along racial lines from 1652, and was further entrenched during the apartheid years (1948 - 1994). When South African citizens were classified according to racial divisions, the apartheid government ensured that not only were children of different race groups taught separately, but also that resources were allocated according those racial lines. White children received the largest proportion of the education budget, followed by Indian children, followed by coloured children, and last, black children, who received the least amount of funding and resources (Nkabinde, 1993). The government spent 15% more on the education of white children than that of black children (Nkabinde,

1993). Thus the aims of apartheid education were to ensure the acceptance by blacks that apartheid was a natural order of things; that whites were superior and blacks were inferior; and that black intellectual development was limited by restricting educational resources, amongst other things (Gwalla-Gisi et al., 1998). In essence, the white child grew up to enjoy the 'fruits of the land' while the black child provided a labour force that supported a 'white' economy. All of these were achieved by the careful manipulation of the educational curriculum and skewed allocation of resources.

Apartheid not only segregated people along racial lines; it also separated children in a school setting according to ability and disability (Engelbrecht, 2006). In essence, apartheid schools were separated along two lines: Race and disability (Department of Education, 2001). It is not surprising that the first school for children with disabilities established in 1863 by Catholic missionaries, only catered for white and coloured children (Gwalla-Gisi et al., 1998). During the 1960s the South African government created what was known as the Integrated System of education. The Integrated System meant that children with special learning needs were integrated in mainstream schools. However, they were taught in separate 'special' classes. White, coloured and Indian children received this form of remedial education; it was not available at black schools, and black children who attended mainstream schools, therefore received no form of remedial or special education. Those with severe disabilities were, however, educated or 'trained' in special institutions or clinics. Also, it was common practice for churches, non-governmental and private organisations to take responsibility for the education of disabled black children. It was only in the late 1980s and early 1990s that special education became available to black children in cities, but there was still no such provision for their rural counterparts (Nkabinde, 1993).

By the late 1980s and early 1990s political and ideological changes occurred in South Africa and the need for transforming educational policies arose (Links, 2009). An example of

a political change included the unbanning of the African National Congress (ANC). When the ANC government came into power in 1994, they set about the task of changing the face of the South African educational system. One of the key changes implemented in 2001was the acceptance of the *White Paper 6* that outlines policy for the implementation of inclusive education (Links, 2009). In 1994, the same year of South Africa's first 'free and fair' democratic elections, the government further showed its commitment to changing the face of education through ensuring equal access to education for all when they signed the Salamanca Statement in Spain.

Status of Inclusive Education in South Africa

What follows is a timeline of milestones achieved, and policies implemented by the South African government to ensure commitments as outlined in the Salamanca Statement:

- *1994:* South Africa's first 'free and fair' democratic elections
- *1994:* South Africa signs the Salamanca Declaration
- *1996: The South African Constitution and Bill of Rights* promulgated
- *2000:* In Dakar, Senegal, the South African government commits to pursuing the *Education for All* goals as one of the Millennium Development Goals set by the United Nations (Department of Basic Education, 2010).
- *2001:* "The Minister of Education launched *Education White Paper 6, the Policy on Inclusion*, which spells out how barriers to learning should be removed from, and how inclusive education should be gradually introduced into, the entire education system." (Department of Basic Education, 2010, p. 8).
- *2005:* Policy documents such as *Guidelines for Inclusive Learning Programmes*; *Conceptual and Operational Guidelines for the Implementation of Inclusive Education; Full Service Schools and District Support Teams*; *Guidelines for Inclusive Learning Programmes and* the *Guidelines to Ensure Quality Education and Support:*

Special Schools as Resource Centres were introduced as supporting documents to the *White Paper 6* (Department of Basic Education, 2010).

- *2007:* "South Africa signed the *United Nations Convention on the Rights of Persons with Disability* and, in 2008, was amongst the first 20 countries to ratify the Convention." (Department of Basic Education, 2010, p. 8).
- *2008:* "*The National Strategy on Screening, Identification, Assessment and Support (SIAS)* was launched, providing strategies for teachers to implement the main elements of an inclusive education system in a collaborative working relationship with parents and learners." (Department of Basic Education, 2010, p. 9).
- *2010:* The most recent policy document on inclusive education: *Guidelines for Inclusive Education Teaching and Learning* was implemented.

The implementation of these policies over the past 17 years speaks to government's commitment to inclusive education, but, like other countries, it struggles to implement these successfully.

Specific challenges faced in South Africa. For South Africa, the legacy of apartheid education has added a further dimension. Unfortunately special needs education is the area where the effects of apartheid education are most felt (Engelbrecht, 2006). As reported by Gwalla-Gisi et al. (1998), South Africa faces formidable barriers: Legacy of the racial ideology; widespread violence and conflict, and lack of early childhood education programmes. Disparities between educational provision and access to different race groups and socio-economic groups are still felt. For example, since most parents still have to pay school fees, wealthier parents are able to provide better future prospects for their disabled children. This constitutes a minority of advantaged families and the vast, mostly black, majority of parents are not able to provide for their disabled child thus limiting their child's future prospects.

Some of the specific realities of inclusive education in the South African context will now be considered. A huge economic disparity remains in our educational context. Some schools in South Africa are extremely well-resourced (both in terms of physical and human resources), while others are seriously under-resourced. This is largely due to the fee paying structure that exists within the South African educational system where some schools charge exorbitant fees while other schools are not able to charge any fees at all. This dichotomy exists within educational districts,[8] cities and provinces. School fees determine the quality of educational access available to children, and how much parents can afford depends on their financial means. This is not only the case for privately educated children but also those in many of the former Model C[9] schools. Parents who are able to pay higher fees are able to send their children to well-resourced schools with better facilities. These parents are also able to pay for tutors for extra tuition or occupational therapists to improve the child's physical and/or mental development. Indeed many of the independent (private) schools in South Africa provide and cater for children with varying levels of disability and special needs. Independent schools are attractive options to many parents with disabled children or children with specific learning difficulties as they offer smaller learning environments and usually better trained staff in the special education field. This option is unfortunately only available to a very small minority of the South African school-going population.

What is the reality for the rest of the children in state-owned schools? According to Pillay and Di Terlizzi (2009), South Africa "is not equipped with resources and facilities required to meet the needs of inclusion." (p.493). Mainstream schools do not yet provide the necessary structures (such as multidisciplinary learner support personnel) for learners with special needs (Pillay & Di Terlizzi, 2009). However, the government has begun the

[8] Educational district: local-based government boundary which facilitates an integrated approach to service delivery by all levels of government, in line with national policy.

[9] Former Model C school: Former Model C schools are those schools that were reserved for white learners under apartheid. The term is not officially used by the Department of Basic Education, but is widely used to refer to former whites-only schools.

conversion of specially selected primary schools into 'full service schools' (special educational needs schools that offer their services and resources to mainstream schools). The aim is to provide mainstream schools with appropriate resources, support and intervention strategies (Pillay & Di Terlizzi, 2009). The main challenge facing the implementation of inclusive education in South Africa remains funding in mainstream state-owned schools. In addition to a lack of funding in state-owned schools, the effects of poverty are huge obstructions to ensuring inclusive education. Poor children with learning disabilities face specific additional challenges, for example, poverty could mean a child does not have access to a scribe[10] (whose services are usually paid for by the parents) during examinations. These situations, by their very nature, exclude such children from learning opportunities. The abovementioned barriers to learning and academic performance impede the true nature of inclusivity. Thus massive cross-sectoral economic investments on behalf of the South African government are needed to achieve successful inclusive education (Pillay & Terlizzi, 2009).

The situation in rural schools is even more desperate. Teachers and principals in rural schools have the added burden of sometimes having to teach multi-grade classes (more than one grade per class group), of isolation from teachers at other schools or from circuit managers,[11] and problems with punctuality and attendance due to far distances travelled by learners.

Additional challenges in the provision of special needs education in South Africa are: Adequate pre-service and continued in-service teacher training, negative attitudes towards people and children with disabilities, large classes, issues around language of instruction as opposed to mother tongue instruction, amongst others (Eloff & Kgwete, 2007). There can be no doubt that the demands placed on teachers are immense.

[10] Scribe: One who records written answers to exam questions on behalf of the child who has a learning or physical disability

[11] Circuit managers: education department personnel responsible for overseeing the implementation of national policies at schools.

The challenge for the government is to provide adequate, quality education for children with obvious physical and mental disabilities in special schools or facilities; as well as cater for children with not so obvious learning (e.g. ADHD) and environmental difficulties (e.g. poverty) in mainstream schools.

South Africa faces many challenges in the implementation of inclusive education. One of the challenges is addressing teachers' knowledge and understanding of learning disabilities, and the management of such learning barriers.

Summary

This chapter provided an overview of the current status of inclusive education in developed and developing countries. It was also a review of the current status of inclusive education in South Africa, and the specific challenges that accompany policy and implementation.

In the next chapter an outline of learning disabilities and dyslexia is provided. This review includes definitions of learning disabilities and dyslexia, prevalence of learning disabilities in mainstream South African high schools, causes of dyslexia, amongst others.

Chapter 3: Learning Disabilities

This chapter is a review of learning disabilities in general, and the definitions, causes characteristics and evaluation of dyslexia.

Learning disabilities constitute the most prolific type of disability in special needs education. Many definitions exist regarding the term ‘learning disabilities’. In fact, much criticism is leveled against this field because there is a lack of consensus on the definition of ‘learning disabilities’ (Hamill, Leigh, MacNutt & Larsen, 1987). Experts in the field find themselves in the precarious position of wording the definition very carefully since the definition itself has implications for funding, identification, remediation and access to education (Hamill et al., 1987).

Definitions of Learning Disability

The term ‘specific learning disabilities’ was first coined by Kirk in 1962 (Kirk & Kirk, 1983). The definition below is considered to be the first formal definition of ‘learning disabilities’:

> A learning disability refers to retardation, disorder, or delayed development in one or more of the processes of speech, language, reading, spelling, writing, or arithmetic resulting from a possible cerebral dysfunction and/or emotional or behavioural disturbance and not from mental retardation, sensory deprivation, or cultural or instructional factors. (Kirk & Kirk, 1983, p.20)

The definition developed by the National Advisory Committee on Handicapped Children (NACHC) in 1967; a definition widely used for legislation and funding in the United States:

> Specific learning disability means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or

> to do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage (Torgesen, 2004, p. 22)

In 1990 The National Joint Committee for Learning Disabilities (NJCLD) constructed the definition below that still enjoys popular consensus (Torgesen, 2004):

> Learning disabilities is a general term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span. Problems in self-regulatory behaviors, social perception, and social interaction may exist with learning disabilities but do not by themselves constitute a learning disability. Although learning disabilities may occur concomitantly with other handicapping conditions (for example, sensory impairment, mental retardation, serious emotional disturbance) or with extrinsic influences (such as cultural differences, insufficient or inappropriate instruction), they are not the result of those conditions or influences (Torgesen, 2004, p. 23).

The definition by Kirk in1962 attributes a learning disability to an ‘emotional disturbance’; the NACHC (1967) explicitly states that a learning disability can be a result of physical injury, while the NJCLD (1990) explains that a learning disability is intrinsic to the individual. Also, it is only the NJCLD (1990) definition that presumes the role of a dysfunctional central nervous system in learning disabilities, and acknowledges that a learning disability is a lifelong disorder. However, there are many similarities between the

three above-mentioned definitions. They all recognize the characteristics of a learning disorder such as problems in reading, writing and spelling. They are also in agreement that a 'learning disability' is not due to social or cultural influences and nor is it due to ineffective classroom instruction.

According to Mercer, Forgnone, and Wolking (1976), the definition of 'learning disabilities' has undergone three 'eras'. While the first era placed emphasis on learning disabilities in the area of brain injury, the second era classified it as minimal brain dysfunction, and the third era saw the emergence of the term 'specific learning disabilities' (Mercer et al.,1976). During the 'first era', the notion of learning disabilities as a result of brain injury was first proposed by Strauss and Lehtinen in 1947. They believed that brain injury caused many of the characteristic signs of learning disabilities such as hyperactivity, distractibility and perceptual disturbances (Survey of Special Education and Accommodation Strategies, n.d.). During the 'second era' learning disabilities were attributed to minimal brain dysfunction (Mercer et al., 1976). This term was used to distinguish between children with severe neuropathology and those with symptoms as described by Strauss and Lehtinen (i.e. hyperactivity and perceptual difficulties) (Survey of Special Education and Accommodation Strategies, n.d.). The 'third era', based on the term 'specific learning disabilities', led to the definition that was developed by the NACHC in 1967 (Mercer et al., 1976).

Prevalence of Learning Disabilities in South African Mainstream Schools

Statistics show that the majority of learners with special educational needs catered for in mainstream schools have mild to moderate learning difficulties (such as ADHD and dyslexia). According to a South African educational portal's fact sheets, the number of learners with special educational needs in mainstream schools totalled 90 871 in 2007; of these 17% had attention deficit disorder (ADD) or ADHD, while 23% had dyslexia (Department of Education, n.d.).

Dyslexia

While autism and ADHD are two of the more common learning disabilities, dyslexia appears to be the most common learning disability in mainstream schools since the average number of children with dyslexia universally appears to be between 10-15% of the population (Wadlington & Wadlington, 2005).

As this study is concerned with teacher awareness of dyslexia in mainstream high schools, a more detailed investigation into dyslexia is now presented.

What is dyslexia? Before considering what the term 'dyslexia' encompasses, it is worthwhile to consider what dyslexia is not. Olson (2002) states that poor reading ability, which is directly linked to deficient educational instruction and/or home environment, does not constitute dyslexia. However, there are a significant number of children who struggle to learn to read effectively despite adequate instruction. These are the children who are considered 'dyslexic'.

Dyslexia literally means 'difficulty with words'. Dyslexia is a specific learning disability in which the individual experiences difficulties with acquiring the necessary skills for effective reading. Dyslexics also experience difficulties with spelling, writing and pronunciation of words. These difficulties exist even though dyslexics have the necessary cognitive abilities and exposure to adequate instruction (International Dyslexia Association, 2008). It is considered to be a complex neurologically based condition (Department of Basic Education, 2010). It is a lifelong disability and since it is not a disease there is no 'cure'. Individuals who struggle with dyslexia experience lack of academic progress, lowered self-esteem, misinterpretation of social cues, depression and anxiety.

Definitions of dyslexia. There are varied definitions of dyslexia since agreement of what the term means remains a challenge for researchers. Some definitions are rooted in the neurological basis of dyslexia (e.g. "It is dependent upon

fundamental cognitive disabilities which are frequently of constitutional origin.") (Miles, 1995, p.40); other definitions refer to its observed symptoms (e.g…"fail to attain the language skills of reading, writing and spelling.") (Miles, 1995, p.40); while further definitions incorporate instructional methods (e.g…" is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction.") (Lyon, Shaywitz & Shaywitz, 2003, p. 2).

Definitions of dyslexia have evolved over time as research and understanding have increased. Samuel Orton (1879-1949) who was one of the pioneers in the field of dyslexia described dyslexia as a neurological disorder that responds to environmental treatment (Pennington, 2002). Interestingly, treatment of dyslexia was already a component of early definitions or descriptions of the phenomenon. Other biological definitions are founded on the premise of problems with brain structure, brain function, neuro-biolological factors and heritability (Vellutino, Fletcher, Snowling & Scanlon, 2004). For example, "Dyslexia can be defined as a neuro-developmental disorder with a biological origin…" (Frith,1999, p. 192).

While some researchers argue that dyslexia occurs at a biological level, others believe that the problem occurs at a cognitive level. Another pioneer in the field of dyslexia, Isabelle Lieberman (1921 – 1990), made major contributions to our understanding of the cognitive processes involved in dyslexia. She proposed the phonological hypothesis as an explanation for dyslexia; a hypothesis that is still widely accepted by other experts in the field (Pennington, 2002). Snowling (1987) has provided much empirical evidence for Liberman's original proposal and enjoys much support for her own proposed phonological deficit hypothesis (explained in more detail later in this chapter). Indeed, a plethora of dyslexia definitions includes a component of phonological awareness.

Frith (1999) believes that even though dyslexia has a neurological origin with certain behavioural signs, cultural influences cannot be excluded in a definition; while Fletcher,

Coulter, Reschly, and Vaughn (2004) argue that since definitions influence identification, a definition of dyslexia should focus on a response to instruction.

Tonnessen (1997) argues that definitions should be based on symptoms rather than causes. For instance, he states that definitions must be operational and should be in the form of a hypothesis. He states that because of these ongoing debates, when defining dyslexia, we need to constantly devise a definition that suits our purposes.

An 'evolution' of the definition of dyslexia and its contributing factors follows. According to Miles (1995), in 1968, the World Federation of Neurology proposed two definitions of dyslexia:

Specific developmental dyslexia: "A disorder manifested by difficulty in learning to read despite conventional instruction, adequate intelligence and socio-cultural opportunity. It is dependent upon fundamental cognitive disabilities which are frequently of constitutional origin." (Miles, 1995, p.40).

Dyslexia: "A disorder in children who, despite conventional classroom experience, fail to attain the language skills of reading, writing and spelling, commensurate with their intellectual abilities." (Miles, 1985, p.41).

The first definition pays homage to the influence of instruction and socio-cultural factors. The second definition focuses on the characteristics of dyslexia. However, both definitions reflect a 'discrepancy theory of dyslexia'. This theory of dyslexia refers to the discrepancy between expected and observed achievement (Tonnesen, 1997). Expected achievement is based on the child's intelligence quotient (IQ), while the observed achievement is based on the child's academic progress at school.

The wording of the first definition proved more popular as a description of dyslexia; while the term 'dyslexia' (in the second definition) proved more popular as a label. Parents, in particular, are in favour of the term 'dyslexia' as it has positive implications for associated

legislation, early identification and appropriate remediation, and proper funding (Tonnesen, 1997).

After more than twenty years of increased research the definition below was formulated. In 1989, the British Dyslexia Association described dyslexia as:

> ... a specific learning disability, constitutional in origin, in one or more of reading, writing and spelling, and written language, which may be accompanied by difficulty in number work. It is particularly related to mastering and using written language (alphabetic, numerical and musical notation) although often affecting oral language to some degree. (Miles, 1995, p. 40)

The above definition mentions the aetiology and the characteristics of dyslexia but no mention is made of cultural considerations or instructional methods that appeared in the 1968 definition.

In 1994, Lyon proposed the following definition, after increased research into causes, symptoms and treatment:

> Dyslexia is one of several distinct learning disabilities. It is a specific language-based disorder of constitutional origin characterized by difficulties in single word decoding, usually reflecting insufficient phonological processing. These difficulties in single word decoding are often unexpected in relation to age and other cognitive and academic abilities; they are not the result of generalised developmental disability or sensory impairment. Dyslexia is manifest by variable difficulty with different forms of language, often including, in addition to problems with reading, a conspicuous problem with acquiring proficiency in writing and spelling. (Lyon et al., 2003, p.2)

Although the above definition proved more popular than the 1989 definition, it had its shortcomings, and adaptations were necessary. Fletcher et al. (2004) and Lyon et al. (2003)

were both in agreement that the broad term ‘learning disabilities’ be replaced by the term ‘specific learning disability’ (Lyon et al., 2003). The current definition, proposed by Lyon et al. (2003), reflects the great advances in the role that neurobiology plays, and has always played, in our understanding of dyslexia. The new definition is also more specific with regard to the characteristics of dyslexia, for example it acknowledges poor spelling as a characteristic of dyslexia. The notion of dyslexia as a language-based disorder continues to receive recognition since it is based on research evidence (Lyon et al., 2003). The quality of response to instruction was also an important addition to the latest definition (Lyon et al., 2003). The definition currently most widely used and accepted is:

> Dyslexia is a specific learning disability that is neurobiological in origin. It is characterised by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge. (Lyon et al., 2003, p.2)

Causes of dyslexia. There are as many proposed causes as there are conflicting definitions. Brief outlines of some of the proposed causes of dyslexia are considered below.

Biological causes of dyslexia. Some argue that dyslexia has a medical or biological origin (Snowling, 1987). As previously stated, Samuel Orton, described dyslexia as a neurological disorder. Since then many of the researchers who explored this avenue (Nicolson & Fawcett, 1999; Shaywitz & Shaywitz, 2008; Stein, 2001), investigated different areas in the link between dyslexia and neurobiology.

Brain structure. Vellutino et al. (2004) reported that dyslexics exhibited uncharacteristic symmetries in the left hemisphere and right hemispheres of their brains. In non-dyslexics the left hemisphere is larger than the right hemisphere. Since the left hemisphere supports language functioning, the symmetry of both hemispheres is seen as a partial cause to reading problems that can be attributed to language deficiencies in dyslexics. Post-mortem studies or anatomical magnetic resonance imaging (aMRI) are used to study brain function (Vellutino et al., 2004). A criticism of the former method of investigation is that such studies cannot occur on a large scale since dyslexia is not a cause of death and therefore the access to such brains is limited.

Brain function. There is overwhelming evidence that the central disability in dyslexics is a deficit in their language system and more particularly with phonology (discussed later in more detail) (Shaywitz et al., 2002). In magnetic source imaging (MSI) studies, differences in brain function were found between dyslexics and non-dyslexics: Differences were found in brain activity in temporal and parietal areas of both hemispheres. These differences were confirmed by changes that took place in the "…neural circuits of the left hemisphere that tend to be activated in good readers" (p.21) after remediation (Vellutino et al., 2004). This is supporting evidence for research conducted by Shaywitz et al. (2002), who found dyslexics' brains to reflect a failure of left hemisphere posterior brain systems functioning. These findings are not completely new to the field of research since as early as 1891 Dejerine found that a part of the posterior brain was a critical component for reading ability (Shaywitz & Shaywitz, 2008). Therefore, the disruption in the posterior brain system is now considered a key factor in reading disability in dyslexics (Shaywitz & Shaywitz, 2008).

Role of the cerebellum. While some researchers attribute a disruption in the posterior brain system of dyslexics for their difficulty in reading, others attribute the role of the cerebellum to this disability. Nicolson and Fawcett (1999) conducted studies that showed that

dyslexics perform very poorly compared to their non-dyslexic counterparts on activities that require cerebellular processing. The cerebellum is responsible for eye movements, and 'inner speech'; areas in which many dyslexics experience difficulty. This accounts for reasons why dyslexics perform poorly not only in tasks related to reading, spelling and language acquisition but also in tasks that test sensorimotor skills.

Genetic studies. A final area of study for the advocators of the biological model is that of heritability. Early studies by researchers such as Orton and Hallgren (Van der Leij, De Jong & Rijswik-Prins, 2001) showed evidence that dyslexia has a strong genetic link. According to Vellutino et al. (2004), "the risk of dyslexia is eight times higher in children where there is a parental history of reading difficulties." (p.21). Genetic evidence is probably the most convincing argument in favour of a biological cause as studies are carried out on monozygotic and dizygotic twins that show concordance rates of above 80% and just below 50% respectively. Even though one can always argue the influence of environmental factors in studies using twins, the concordance rates are too high to deny a genetic link (Vellutino et al., 2004). Genetic evidence is also supported by molecular evidence from DNA analyses suggesting particular chromosomes linked to dyslexia (Olson, 2002).

Cognitive causes of dyslexia. While some researchers propose a biological cause for dyslexia others believe that dyslexia is caused by a cognitive deficit. The cognitive deficit theories are not without their critics. Snowling (2001) claims it is difficult to determine whether the deficit is a cause or a consequence of reading problems, yet the vast amount of empirical support they have garnered cannot be denied. There are many possible causes of dyslexia at a cognitive level which include visual deficits, language-based deficits and auditory deficits (Vellutino et al., 2004).

Visual deficits. The most influential theories of dyslexia in the 1970s and 1980s implied deficits in the visual system. These theories inferred that the cause of dyslexia was

due to poor visual perception and deficits in visual memory (Vellutino et al., 2004). According to some researchers reading disabilities are caused by visual tracking problems linked to oculomotor deficiencies (Coltheart & Jackson, 1998; Vellutino et al., 2004). These theories attributed dyslexia to the inability of visually tracking words and word patterns that are necessary for effective reading ability. Although very influential, these theories received much criticism due to a lack of empirical support (Vellutino et al., 2004). These theories were also discredited by other researchers who found no particular differences in eye movements between poor and normal readers on visual tracking (Vellutino et al., 2004).

Language-based deficit: 'Phonological Deficit Hypothesis'. There are a number of language-based hypotheses that attempt to explain dyslexia. Snowling's (1987) 'phonological deficit hypothesis', remains the most popular theory of all the cognitive theories that attempt to explain dyslexia to date. The 'phonological deficit hypothesis' refers to weaknesses in the way an individual codes phonics (sounds). Phonological coding is "the ability to use speech codes to represent information in the form of words and parts of words" (p.12) and it is widely accepted that weak phonological skills are the underlying cause of dyslexia (Vellutino et al., 2004). Poor phonological awareness or representation (low level oral skills) leads to difficulty in processing information in the working memory, a deficit in rapid naming skills, difficulties in name storage and retrieval (short term working memory), word identification, fluency in reading and word spellings. These processes have been identified as key areas that separate dyslexics from non-dyslexics (Coltheart & Jackson, 1998; Snowling, 2001; Van der Leij et al., 2001; Vellutino et al., 2004). This is supported by Griffiths and Snowling (2002), who found that difficulties in phonological awareness and skill acquisition in alphabetic coding are believed to be caused by weak phonological coding characterised by poor phonological representations.

There is compelling evidence that supports the phonological deficit hypothesis as a cause of dyslexia. For example, Vellutino et al. (2004) found that successful instruction in the remediation of dyslexic characteristics, targets phonological awareness and letter-sound mapping on word identification, spelling and reading. The hypothesis thus enjoys much support as it accounts for reading-related problems that respond well to direct remediation (Nicolson & Fawcett, 1999). As with any theory or hypothesis that has support, the phonological deficit hypothesis is not without its critics. Some argue that characteristics of dyslexia such as clumsiness, poor handwriting, distractibility and forgetfulness are signs of poor motor skills rather than poor phonological skills (Nicolson & Fawcett, 1999).

Auditory deficits. While many cognitive theorists argue in favour of the phonological deficit hypothesis as being the dominant cause of dyslexia, others propose auditory deficits as the main cause (Heiervang, Stevenson & Hugdahl, 2002). Researchers (e.g. Fitch, Miller & Tallal, 1987) suggested an auditory processing deficit hypothesis as an explanation for reading disability (Heiervang et al., 2002). The auditory processing deficit hypothesis is sometimes known as the temporal processing or temporal perception hypothesis. The hypothesis states that there is a deficit in the neural system which is responsible for the processing of stimuli that have short duration and appear in rapid succession (Heiervang et al., 2002). Again criticism of such a hypothesis focuses on the fact that the hypothesis cannot explain dyslexic characteristics such as distractibility, forgetfulness and clumsiness.

Evaluating dyslexia. The International Dyslexia Association (IDA), which is a leading organisation in information output and canvasses for the rights of dyslexics and research, uses the term ‘evaluation’ as opposed to ‘testing’ to explain the procedure of determining the presence of dyslexia. ‘Evaluation’ is an appropriate term to use as it is all-encompassing, covering aspects of information gathering, screening, testing, diagnosis, intervention planning and documentation (International Dyslexia Association, 2008). The

process of evaluation involves gathering information from parents and teachers (or significant others), conducting tests, and then devising intervention strategies to remediate areas of weakness (International Dyslexia Association, 2008). According to the International Dyslexia Association (2008) there are three important components of the evaluation process: Identification, intervention planning and documentation. Identification involves identifying the source of the problem; intervention planning focuses on the steps needed to be taken for effective remediation; and documentation that includes a history of intervention which is important for obtaining special concessions (e.g. spelling dispensations), modifications in the classroom (e.g. note-taking on a laptop as opposed to writing) and access to special schools (International Dyslexia Association, 2008).

According to the International Dyslexia Association (2008), an effective evaluation process should include the following specific components:

- *Information gathering:* Assesses the cognitive strengths and weaknesses of the individual. Evidence of delay usually means the child is at-risk for reading problems.
- *Intelligence:* Until very recently an IQ test was considered a very important component of the diagnostic assessment for dyslexia. Many definitions of dyslexia include the achievement-intelligence discrepancy. Researchers report that dyslexics are individuals who tend to exhibit average to above average intelligence but poor academic achievement (Vellutino et al., 2004). According to the Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV), a main "criterion of dyslexia is a large discrepancy between the actual and expected levels of achievement in reading and spelling, given the child's age and intelligence."(Singer, 2008, p. 318). A diagnosis of dyslexia therefore traditionally involves formal testing of intellectual quotient (IQ) and language-based skills such as rapidly naming items, phonemic awareness and word identification (International Dyslexia Association, 2008;

Snowling, 1987). However, current regulations no longer require such testing since intelligence is not a predictor of language problems. Also, intelligence tests are not the only way of measuring intellectual ability; it can also be measured by academic success (International Dyslexia Association, 2008).

- *Oral language skills:* The ability to listen to, and understand speech, and to express thoughts through speech. Oral skills comprise low-level language skills (e.g. recognizing sounds) and higher-level skills (e.g. written expression of thought). Dyslexics are believed to have adequate or strong high-level language skills but poor low-level language skills (International Dyslexia Association, 2008). This means the dyslexics struggle to learn to read and spell using the 'sound system' of language (phonetics).
- *Word recognition*: The ability to read words in print. It is also referred to as 'word reading' or 'word identification'. Word recognition involves accuracy and fluency of reading. Dyslexics are often accurate in their reading but are very slow readers. Both accuracy and speed of word reading are important in the understanding of what is being read (International Dyslexia Association, 2008).
- *Decoding:* The ability to read unfamiliar words and make sense of them by means of 'chunking' or spelling patterns. A test of decoding involves nonsense words that forces children to decode unfamiliar words rather than depend on memory of words already known to them (International Dyslexia Association, 2008).
- *Spelling:* Spelling tests the child's ability to spell individual words from memory. It is usually the most severe weakness among dyslexics and the most difficult to remedy (International Dyslexia Association, 2008).
- *Phonological processing:* An auditory processing skill that young children use to decode adult speech. It is a low-level language skill that does not involve the

decoding of meaning. It is the 'sound system' of language. Dyslexic learners often have difficulty identifying, pronouncing or recalling sounds (International Dyslexia Association, 2008).

- *Automaticity/fluency skills:* Individuals with dyslexia generally process information slowly. Information processing refers to one's ability to receive, store and retrieve information. The speed of naming letters and words is one of the best predictors of reading problems (International Dyslexia Association, 2008).
- *Reading comprehension:* Dyslexics often score lower on reading comprehension tests than on listening comprehension because of their difficulty to decode printed words (International Dyslexia Association, 2008).
- *Vocabulary knowledge:* Dyslexics have poor vocabulary development. They do not often read as they find it tiring and arduous (International Dyslexia Association, 2008). In addition, their difficulty with memory and ability to learn the meaning of words affects their vocabulary acquisition (International Dyslexia Association, 2008).

It is important to remember that when conducting an evaluation of dyslexia, other possible factors such as socio-economics, age, current learning environment, emotional adjustment and previous instruction should all be ruled out as a possible cause of reading disability.

The following considerations should be made when evaluating suspected dyslexia in a child. An initial evaluation must be made tentatively as poor readers may also fit the profile of dyslexia. The planning of intervention should provide detailed instructions outlining how very specific gaps and weaknesses will be met. Accompanying documentation should support recommendations for concessions, accommodations and special education (International Dyslexia Association, 2008).

Characteristics of dyslexia. Dyslexia exhibits itself on a continuum of severity and is unique to each individual. However, most dyslexics display difficulties in the following areas:

- Short-term memory
- Word retrieval
- Rapid naming
- Reading
- Spelling
- Processing information
- Speech
- Coordination
- Organisation

(Claasens, 2007)

Effective instruction. Researchers believe that intervention is most effective when done promptly (Gersons-Wolfsensberger & Ruijssenaars, 1997). The International Dyslexia Association (2008) supports this view by reporting that early identification and evaluation is crucial for the success of the dyslexic pupil in school and in life. It is recommended that after evaluation, a structured programme of remediation should be developed by trained personnel. Dyslexics usually require one-on-one assistance so that they can progress at their own pace (International Dyslexia Association, 2008). However, the IDA later claimed that intervention in groups of two to five matched individuals is equally effective as one-on-one instruction (International Dyslexia Association, 2009). What is important is that individuals be taught in a very structured and systematic method. Intervention normally includes activities such as word recognition skills, word attack skills,[12] word identification and fluency skills. In

[12] Word attack skills– the ability to make sense of an unknown word.

addition to these, researchers such as Reason (2001) believe that intervention strategies targeting the learner with dyslexia could also benefit non-dyslexic learners with varying learning styles. This argument is valid since most dyslexic learners do not have access to one-on-one intervention as most dyslexic learners are educated in mainstream schools where they are not removed from lessons to receive individual remediation.

Intervention does not only include specific language-based skill activities. It includes concessions, accommodations and modifications for dyslexic learners. Concessions refer to the granting of or relaxation of a rule. For example, a spelling concession involves a learner not being penalised in a test for spelling errors. Accommodations include aspects such as extra time and the aid of a scribe in examinations, the use of a laptop with a 'spell check' option and taped tests; while an example of a modification is allowing a student to take an oral exam instead of a written exam. Intervention also includes counselling to deal with issues of confidence, self-esteem, anxiety, and other related difficulties that may arise (International Dyslexia Association, 2008).

The International Dyslexia Association (2009), however, cautions parents, teachers and other trained specialists against some of the pitfalls of intervention. One of the main cautions is against the plethora of 'treatment programmes' advertised on the internet. There are so many companies and organisations that claim to have a 'quick fix' solution to dyslexia. There is no 'treatment programme' that can 'cure' dyslexics of their disability; especially one that proposes 'success' in a specific time period (International Dyslexia Association, 2009). The International Dyslexia Association (2009) warns that an on-line 'treatment programme' can never be a substitute for specialised face to face intervention with a trained professional. They also caution parents that given the individual nature of response to intervention, programmes can be extensive, expensive and time consuming. Parents must be prepared for these eventualities.

Even though intervention might prove successful for academic success, it does not necessarily resolve the issues dyslexics face with low self-esteem and anxiety (Berninger, 2000). Dyslexics often experience anxiety caused by a sense of isolation from peers, and suffer with low self-esteem due to their feelings of failure and inadequacy (Long, MacBlain & MacBlain, 2007). Many dyslexics will continue to struggle with the effects of their disability throughout their adult lives even with the most effective remediation.

There can be no denying that teachers (and other significant educational personnel) are important role-players in successful identification, assessment and effective instruction of dyslexia. An adequate level of teacher awareness of dyslexia is thus paramount.

Summary

This chapter is a review of the various definitions of learning disabilities and dyslexia, prevalence of learning disabilities in mainstream schools, causes of dyslexia, how dyslexia is evaluated, et cetera.

In the next chapter the researcher provides an overview of teacher awareness of learning disabilities and dyslexia, the reasons for teacher lack of awareness globally, teacher training around special needs education and dyslexia, and the current status of teacher levels of awareness in South Africa.

Chapter 4: Teacher Awareness of Dyslexia

It is well documented that teacher awareness and management of learning disabilities is of utmost importance to the success (academic, social and emotional) of the student. However, according to research, mainstream education teachers have generally been found to lack understanding of learning disabilities (Hayes, 2000; Karande et al., 2009; Kataoka et al., 2004). A study conducted by the Ministry of Education in Japan found that some teachers were even unsure if their learners had learning disabilities or not (Kataoka et al., 2004).

Status of Teacher Awareness of Dyslexia

The regular classroom teacher can be a positive factor when it comes to helping learners overcome their learning difficulties (Hayes, 2000). Yet, research shows that this is not necessarily the case when teachers have no awareness of a child's learning disability (Hayes, 2000; Kataoka et al., 2004). In the past (and still today), teachers believed that underachievement was either due to a lack of intelligence or laziness. Many teachers believe that any child can learn and succeed if he or she has enough motivation (Hayes, 2000). This kind of ignorance is detrimental to the academic success of the learning-disabled student. According to Kataoka et al. (2004), teacher awareness of learning disabilities is paramount for provision of and effective remediation. A lack of awareness means that intervention is delayed (Kataoka et al., 2004) or never occurs at all. Even if teachers do have an 'awareness' they report that they feel they do not have the necessary skills that are needed to help their learners. They feel a sense of powerless and helplessness (Hayes, 2000). This sense of powerlessness has repercussions for the working relationship between the teacher and the student. Some teachers tend to blame the child's lack of progress on their own lack of teaching skills, others have low expectations of the child, while others have been reported to insult and even physically punish learners who suffer from learning disabilities (Karande et

al., 2009; Kataoka et al., 2004). All of the above means that the learning-disabled student can be seriously disadvantaged.

As mentioned earlier, inclusion in schools has meant that teachers now have the additional responsibility and accountability of meeting the needs of the learning disabled child. One such group in particular, is learners with dyslexia (Long, et al., 2007). "As inclusive classrooms become increasingly prevalent, more and more teachers will be called upon to meet the needs of learners with dyslexia." (Wadlington et al., 1996, p.5).

According to Wadlington et al. (1996), dyslexia is still a confusing term for most teachers. Furthermore, they are confused by the legal and ethical responsibilities that accompany this term. Many teachers juggle a balancing act between catering for the needs of the majority non-disabled student population and catering for the individualised needs of the learning-disabled (including dyslexics). Teachers often find it difficult to differentiate between learners with dyslexia and slow learners (Wadlington et al., 1996). It is unfortunate that this lack of teacher understanding has negative consequences for the dyslexic learner. This is a worrying situation since most children with dyslexia can be found in mainstream classes as opposed to special schools or special needs classes, and this means that mainstream teachers feel overwhelmed in trying to deal with dyslexic leaners at the expense of others (Wadlington et al., 1996).

According to Wadlington and Wadlington (2005), teachers' attitudes towards their learners' learning disability negatively affects the way learners see themselves (e.g. they can consider themselves 'stupid') and consequently this can affect academic and personal success. This is known as the 'snowball effect' – a learner may at first only experience shame due to low test scores, but eventually suffer from depression and anxiety due to a constant series of failures. Teachers can experience anxieties about dyslexia in a number of ways. They can become demotivated to empower themselves with knowledge about dyslexia. This

lack of motivation could be attributed to the fact that schools do not offer enough continued support for teachers once they are in-service (Wadlington & Wadlington, 2005). They may fail to modify or adapt work to accommodate the needs of the dyslexic learner, or fail to address the holistic needs of the learner. In addition, many teachers do not give parents the benefit of the doubt of knowing their child's lack of abilities and they believe that parents are not 'experts' when it comes to best practices for the child (Robuck, 2007).

However, ignorance about dyslexia should not always be seen as indifference or apathy on the part of the teacher. There are other reasons outside the realm of the teacher's attitude, such as inaccessibility to relevant information, inadequate pre-service training or lack of continued professional development, which could account for this lack of awareness. Yet, there are teachers who are knowledgeable and do go to extraordinary lengths to do the best they can in sometimes difficult or challenging situations. However, there are still many myths that prevail with regard to dyslexia (Wadlington et al., 1996). A common myth about dyslexia is that all dyslexics go on to become great artists such as Picasso or great entrepreneurs such as Richard Branson. (It has been said both struggle with dyslexia.)

In this current global era of inclusion, the teacher is faced with the extra challenge of providing a truly inclusive classroom experience for all learners. The challenge is thus not only to provide appropriate learning materials and/or use appropriate assessment strategies, but, more importantly, to be held accountable for the educational success of all the learners in their care. These additional responsibilities and increased accountability have placed heavy burdens on teachers in recent years, especially those who find themselves ill-equipped to deal with learners who have special educational needs (Long et al., 2007). Teachers in mainstream secondary schools have to overcome daily pressures and stresses to ensure the success of all learners in the classroom, in addition to the extra burdens of teaching those with dyslexia (Peer & Reid, 2001).

According to Long et al. (2007), “high-quality teaching is vitally important if learners with dyslexia are to make progress with their academic learning.” (p.125). The reality of the secondary classroom situation is very different, however.

Training of teachers is important on a number of levels, including tackling misconceptions, negative attitudes and issues of identification and management. According to Long et al. (2007), teachers are failing to address the holistic needs of the dyslexic learner. Too many teachers view the dyslexic learner as having brain parts that are defective or dysfunctional, without viewing the issue in its entirety. In fact, having an awareness of a term is one thing but having knowledge and understanding of its meaning is another (Kirby, Davies & Bryant, 2005). Thus the in-depth and/or continuous training of teachers cannot be neglected.

Many teachers express concern and angst over the fact that they are unable to deal effectively with learners with learning disabilities, dyslexia included (Hayes, 2000). Teachers have expressed concerns in areas such as characteristics of dyslexia, daily assessment and remediation (Wadlington et al., 1996; Wadlington & Wadlington, 2005). A study conducted in Japan by Kataoka et al. (2004), reported that teachers were so overwhelmed at dealing with dyslexia that they failed to tell anyone about their difficulties in trying to help the dyslexic child. They felt responsible for not having the necessary skills and tools with which to help the learners.

Even though much of the research has been conducted in other countries, there is no reason to suppose the situation is any different in South Africa. To understand the reasons why teachers feel inadequate, overwhelmed and burdened, we need to consider the reasons for this lack of awareness.

It is worthwhile to note also that elementary (primary) school teachers seem to display fewer misconceptions about dyslexia than their secondary school counterparts (Wadlington &

Wadlington, 2005). Wadlington and Wadlington (2005) attribute this finding to the possibility that teacher training in dyslexia is more comprehensive in elementary school courses compared to those in high school courses. The present study therefore focuses on the awareness levels of teachers at mainstream high schools.

Lack of Awareness of Dyslexia in Mainstream Schools

There are many reasons why mainstream teachers lack awareness regarding the identification and management of dyslexia. Teacher apathy towards the acknowledgement of dyslexia as a 'real disability' is still a stark reality (Wadlington & Wadlington, 2005). A possible reason for this may be due to a lack of teacher training in the field of dyslexia. Many parents report that teachers refuse to accept a diagnosis of dyslexia and they believe this to be due to ignorance of the phenomenon. As detailed above, studies show that many misconceptions still exist around dyslexia (Wadlington & Wadlington, 2005). For example, many believe that dyslexia only affects individuals during their schooling career. Very few people understand that it is a lifelong disability.

A second reason for teacher lack of awareness is the role played by school management and/or local authorities. Wadlington and Wadlington (2005) argue that school management does not play an important enough role in teacher awareness of dyslexia. It is part of management's duty to ensure that teachers are well-equipped with the strategies of identification and management of the learning disability. Too often school boards do not recognise the importance of the issue or alternatively, use it in order to justify poor results (Wadlington & Wadlington, 2005).

A third reason for lack of awareness has to do with accountability. Too often regular education teachers are of the opinion that identifying and managing children with learning difficulties falls within the realm of special education teachers (Hayes, 2000). Peer and Reid (2001) argue that special education is the role of all teachers, not just the responsibility of the

special needs department within a school. (Hayes, 2000) argues that it is vital that all teachers regard themselves as special needs teachers in order to provide all learners with quality education. Research has found that special needs teachers have a more positive attitude towards learning disabilities (Hayes, 2000). This obviously allows dyslexic learners a better chance of success in their classrooms. Teacher awareness is crucial to the success of dyslexic learners since many of them report high levels of stress when teachers lack understanding and compassion (Karande et al., 2009).

Last, and probably the main reason for lack of teacher awareness, is the lack of teacher training in the field of dyslexia. A study by Carroll, Forlin and Jobling (2003) reports that there is a serious lack of pre-service and in-service training in this area

Teacher Training and Awareness of Dyslexia

According to Dummer-Smoch (1998), "Teacher training is still as deficient as ever in providing guidance about learning difficulties and about specific weaknesses in children whose learning abilities are otherwise normal for their age."(p. 70).

It is clear that successful implementation of inclusion policies needs highly trained teachers in regular and special needs education (Hay, Smit & Paulsen, 2001). But according to research, teacher' lack of awareness of inclusive education is due to the lack of adequate teacher training (Hay et al., 2001). The same can be said for the field of learning disabilities in general and dyslexia particularly. It is no secret that teachers across the globe are inadequately trained to identify and manage children with learning disabilities, and the need for training programmes is enormous (Lovett et al. 2008). South African teachers are even worse off as there is a severe shortage of properly trained regular teachers let alone teachers trained in the field of special education (Nkabinde, 1993).

Since lack of training has a negative impact on teacher awareness and knowledge of learning disabilities and dyslexia, one has to question the reasons for this lack of teacher

training.

One reason proposed for lack of teacher training is teacher attitudes (Carroll et al., 2003). It has been found that teachers generally have negative attitudes towards inclusion (for example, some teachers may not believe that children experience learning disabilities) and therefore might not choose relevant electives during pre-service training or sign up for workshops as part of their in-service training. In fact, research shows that teachers, who had taken courses in special needs education during their pre-service years, had more positive attitudes to learners with disabilities (Chong et al., 2007). However, studies also revealed that this optimism and enthusiasm can quickly wane if new recruits find themselves in schools where they are not provided with opportunities for continued professional development in this area (Gwernan-Jones & Burden, 2009**).** Therefore if the positive attitudes of pre-service teachers can be harnessed and cultivated once they become full-time teachers, learners with special needs would benefit from their knowledge and expertise. A study conducted by Chong et al. (2007) showed that female teachers and primary schools teachers exhibit more positive attitudes towards special needs education than their secondary, male counterparts. It was found that female teachers generally had more sympathy and less fear than male teachers. In addition, they found that teachers who had a family member with a disability were more comfortable managing learners who displayed cognitive and behavioural difficulties (Chong et al., 2007). However, Subban (2005) argues that there is no disparity between the attitudes of males and females towards special needs education. She contends that studies revealing positive female attitudes towards special needs education must be seen in the context in which the study was conducted. For example, in some cultures only females are assigned to care for people with disabilities and thus would seemingly exhibit more positive attitudes.

Another reason given for the lack of adequate training is the quality of pre-service training. It has been found that special needs education training in different countries occurs at many different levels. Some countries have general teacher training and separate training for special education teachers, others offer electives or courses within the regular training programme for those who are interested in this area, and yet others offer no training whatsoever. In South Africa, pre-1994 special needs training as part of, or separate from, regular teacher training was considered a luxury in light of the fact that so many teachers in mainstream education were inadequately trained (Nkabinde, 1993). This may account for the large numbers of black teachers who are inadequately trained in the area of special needs education. Those who have been trained are probably those who attended previously whites-only universities or took it upon themselves to be trained since it was an area in which they had a vested interest. However, this is not necessarily the case today. Many of our teacher training institutions presently offer electives in special needs education or include a compulsory module in their regular teacher training course.

The importance of offering appropriate special needs training to all mainstream teachers cannot be over-emphasised. This training could be provided by universities, other teacher training institutions or non-governmental organisations.

Teacher Awareness of Dyslexia in South Africa

A fair amount of research has been conducted in other countries with regard to assessing teacher levels of awareness of dyslexia (Hayes, 2000; Wadlington et al., 1996; Wadlington & Wadlington, 2005). However, the researcher found no similar literature in pertaining to the South African context. Since teacher awareness of dyslexia internationally is still low, it is believed that this study will corroborate such findings in a South African context.

Summary

It is clear from the existing research that great strides have been made globally in ensuring inclusivity in education. Governments worldwide have introduced policies that grant and protect the rights of all its citizens to basic education. However, the practicalities of implementing these policies have still to be realised in many developing nations, as finances often act as a barrier to such achievement. Creation of new policies often means a change in attitude and training for those assigned the task of such implementation. Teachers have been thrust into a world of new terminology with the onset of inclusive education. Since inclusive education requires all children to be taught in mainstream schools, such teachers find themselves in the position where they need to be equipped with the skills to effectively teach children with special educational needs. Research studies indicate that while teachers are becoming more aware of learning disabilities, they are not necessarily adequately trained to teach children who experience such barriers. Research shows that teachers' level of awareness of dyslexia and how to manage it effectively is generally low. This is also likely to be true in mainstream high schools in a South African context.

The next chapter details the preparation of the empirical study. This chapter includes, among others, specifics regarding the ethical considerations, the nature of the questionnaire and the pilot study.

Chapter 5: Preparations for the Empirical Study

Before conducting a pilot study for the present project a questionnaire was constructed to measure the following variables:

- Teachers' knowledge of dyslexia
- Teachers' belief in their ability to identify dyslexia in their classrooms
- Teachers' belief in their ability to manage dyslexia in their classrooms
- Teachers' perceptions of the adequacy of pre-service training of dyslexia
- Teachers' perceptions of the adequacy of continued professional development of dyslexia

The following issues were taken into account when compiling the questionnaire:

Research Design

"A research design is a strategic framework for action that serves as a bridge between research questions and the execution or implementation of the research." (Terre Blanche & Durrheim, 1999, p.29). Based on the research objectives and the background literature, this study achieved this framework by *electing* to use a quantitative research design. Quantitative research is, in its simplest form, concerned with numbers and anything measurable. In this study nominal and ordinal data were obtained from the responses to items in the questionnaire (see Appendix C). Quantitative research is also concerned with establishing a relationship between two or more variables (correlational) (Hopkins, 2000). For instance, in this study, the researcher sought to examine the relationship between the level of teachers' training and their perception of their ability to manage dyslexia in their classrooms.

Correlational research aims to establish the relationships or associations between variables, unlike experimental research that seeks causality. Correlational research also aims to determine the strength and direction of the relationship between variables. Variables in a correlational study are ex post factor by nature where the researcher has little control over the

independent variables (e.g. age, gender, level of education, etc.), and where the dependent variables are examined or measured. For example, a relationship was sought between the training institutions at which teachers received their qualifications and their ability to identify dyslexic characteristics.

In quantitative research, the survey (non-experimental design) is an appropriate measuring instrument used to elicit this kind of information. A survey questionnaire was used for the purposes of this study. A questionnaire provides information about participants' feelings, knowledge and attitudes. According to Mulumba (2008), it can be used to collect data from large numbers of participants over a relatively short period of time. The survey questionnaire was well suited to this study as the researcher was trying to measure teachers' knowledge and management of dyslexia.

According to De Vos, Strydom, Fouche & Delport (2005) the purpose of the questionnaire is to obtain facts and opinions from people who are generally informed about a particular phenomenon (in this case, awareness of dyslexia). A questionnaire is deemed as the most appropriate measuring instrument since it assures anonymity and asks the same questions of all participants. When completing the questionnaire, participants are free of pressure that might arise when completing the questionnaire in the presence of a researcher. It is also less time consuming than interviews or case studies (Eita, 2007). A criticism by many researchers is that a questionnaire with mostly closed questions limits the depth of responses provided by participants and the level of honesty of responses (De Vos et al., 2005).

The strengths of quantitative research include: Precise, numerical data is provided; data analysis (using statistical software) is generally less time consuming compared to qualitative data analysis and results of quantitative research are generally independent of the researcher (i.e. statistical significance) (Strengths and Weaknesses of Quantitative Research, n.d.).

However, weaknesses of quantitative research include results that are produced may be too general for direct application to specific contexts or individuals (Strengths and Weaknesses of Quantitative Research, n.d.). For example, results produced in this study may not be applicable to educational districts or particular schools in other provinces in South Africa. There is also the presumption with quantitative research that the researcher has extensive knowledge of the subject matter in order to pose the 'right' questions (Durrheim, 2006).

Likert scales. Questionnaires or surveys often use Likert-type scales. These scales are commonly used to measure attitudes, where respondents specify their degree of agreement with each item (De Vos et al., 2005). It is an ordered scale that usually contains five response options: Strongly Agree, Agree, Unsure, Disagree and Strongly Disagree. Each option is scored 1, 2, 3, 4, and 5 respectively. Reverse scored items are scored 5, 4, 3, 2 and 1 respectively. The Likert scale is also referred to as summative scale, as the result of a questionnaire is usually achieved by summing numerical responses (De Vos et al., 2005). The key advantage of the Likert scale is that the odd number of options allows people to take a neutral stance if they genuinely do not have an opinion on the topic. In this study, a Likert-style five-point scale with reverse scored items was used to assess participants' level of agreement or disagreement with statements in sections C to F (items 39 – 80) of the questionnaire (see Appendix C).

Ethical Considerations

When conducting research careful attention should be paid to the welfare of the participants. Researchers are bound to protect the rights of participants by following the ethical principles of research. The following ethical guidelines were adhered to in this study:

Confidentiality and anonymity. Confidentiality is an undertaking by the researcher to protect the anonymity of the participant (Terre Blanche, Durrheim & Painter, 2006).

Confidentiality and anonymity were ensured in this study by the fact that participants were not requested to write their names on the questionnaires.

Protection from harm. According to the American Psychological Association's (APA) ethical guidelines, it is of utmost importance that participants leave the research experience in the same physical and psychological state in which they entered (Howitt & Cramer, 2008). This study presented no psychological or physical danger to any of the participants.

Deception, informed consent and right to withdraw. There was no need for deception in this study as the participants were fully informed of the aim of the study in order to provide the most accurate responses possible. The aim of the study was clearly stated on the questionnaire (see Appendix C). This information preceded the questionnaire and gave the participants the opportunity to make an informed decision as to whether they wanted to participate or not. The school's contact person informed participants that they had the right to withdraw from the study at any time or the right to withdraw their questionnaire after having completed it.

Nature of the Questionnaire

After undertaking a literature review of teacher awareness and dyslexia, an original questionnaire based on theory and research was designed by the researcher (see Appendix C). Items on the questionnaire were based specifically on information taken from IDA fact sheets and adapted to suit the purposes of the study. The aim of the questionnaire was to evaluate the level of teacher knowledge and awareness of dyslexia in mainstream high schools.

The questionnaire is divided into six sections: Demographic information, level of knowledge of dyslexia, perception of ability to identify dyslexic learners, perception of management of dyslexic learners, pre-service training in dyslexia, and in-service training of dyslexia.

Section A: Demographic information. This section, which consists of 15 items (1-15), allowed the researcher to make comparisons between, among others:

- gender and teacher awareness of dyslexia
- age groups and teacher awareness of dyslexia
- level of teacher training and teacher awareness of dyslexia
- educational history and teacher awareness of dyslexia
- employment history and teacher awareness of dyslexia
- level of education and teacher awareness of dyslexia

Items, which were pre-coded, produced nominal data. All items are closed-ended questions, except items 6 and 9 which are open-ended questions. Items are scored in categories starting at number one; items labelled 'other' are assigned a value of '8' or '88' depending on whether they are single-digit or double-digit values respectively.

Section B: Measuring teachers' knowledge of dyslexia. This section, which consists of 23 items (items 16 – 38), aimed to tap teachers' knowledge of dyslexia across the categories of gender, age, level of education, year of teaching qualification, training institution, years' experience and educational district (See hypotheses 1 to 9). All the items are factual statements about dyslexia, except for items number 21, 31 and 38, which are fictional statements (myths or inaccuracies about dyslexia). Participants had to state whether each statement was true or false, or whether they were unsure about the statement. A value of 1 was assigned to the response 'true' to all items except 21, 31 and 38, which were coded 2 since they were 'false' responses. Unsure responses were assigned a value of 3. The possible range of scores is 23-69. A high score (i.e. 43 to 69) indicates a low level of knowledge of dyslexia and a low score (i.e. 23 to 29) indicates a good understanding of dyslexia.

Section C: Measuring teachers' perceptions of identification of dyslexic learners in the classroom. This section, which consists of four items (items 39-41), aimed to tap

teachers' beliefs regarding their to identify dyslexic learners in their classrooms. All items 39-41 are Likert-style items. The minimum score for items 39-41 is 0 and the maximum score 15. No items were reverse scored in this section. Individual items (39-41) were analysed by totalling an overall score for all the items. This analysis allowed the researcher to determine how many respondents believed they could or could not identify dyslexia. An overall high score (i.e.12-15) indicated that the teacher perceived he or she has the ability to identify dyslexic learners in their classrooms, a score of 7-11 indicated a perceived average ability to identify dyslexic characteristics, and an overall low score (i.e. 0-6) indicated they perceived they were unable to identify dyslexic characteristics.

Section D: Measuring teachers' perceptions of management of dyslexic learners in the classroom. Section D measured teachers' perceptions of their ability to manage dyslexic learners in their classrooms. This section consists of 28 items: Items 42-69. Item number 42, which was pre-coded, produced nominal data. Only participants who answered 'yes' to item number 42 *(Are you aware of any dyslexic learners in your class?")* (see Appendix C) were required to answer the remaining 27 items: Items 43-69. Individual items were analysed allowing the researcher to determine how many respondents believed they could/could not manage dyslexia in their classrooms. In addition a total score for each respondent was calculated by adding the values of the answers to all the questions. The objective was to calculate an overall score for all the items combined. An overall high score (i.e. 96-120) indicated that it is the teacher's perception that he or she is very capable of managing dyslexic learners in their classrooms, a score of 61-95 indicated a perceived adequate ability to manage dyslexia in the classroom, while an overall low score (i.e. 0-60) indicated that teachers believed that they are unable to manage dyslexia in their classrooms. Negative statements (*items 56, 59 and 69*) were reverse scored where 'strongly disagree' was assigned a value of 5 and 'strongly agree' assigned a value of 1.

Section E: Measuring pre-service training in dyslexia provided by training institutions. Section E aimed to tap teachers' beliefs that they received adequate pre-service training in dyslexia. This section consists of four items: Items 70-73. No items were reverse scored. Item number 70 *("Have you had pre-service training (training provided by your training institution) in the field of dyslexia?")* (see Appendix C), which was pre-coded, produced nominal data. Only participants who answered 'yes' to this item were required to answer the remaining three items in this section. These individual items were analysed by tallying how many respondents gave a particular response to an item. This analysis allowed the researcher to determine how many respondents received pre-service training. In addition a total score for each respondent was calculated by adding the values of the answers to all the questions. The objective was to calculate an overall score for all the items combined. An overall high score (i.e. 12-15) indicated that teachers perceived their level of pre-service training of dyslexia to be very good. An overall low score (i.e. 0-6) meant that teachers perceived their level of pre-service training of dyslexia to be inadequate and/or lacking.

Section F: Measuring in-service training in dyslexia provided by schools. Section F aimed to tap teachers' beliefs that they received adequate in-service training in dyslexia. This section consists of four items: Items 74-77. Item number 74 *("Have you had in-service training (training provided by your current/previous school) in the field of dyslexia?")* (see Appendix C) was pre-coded producing nominal data. Only participants who answered "yes" to this item were required to answer the remainder of the items. This section consisted of a further three items: Items 75-77. No items were reverse scored. Items 75-77 were analysed by counting how many respondents gave a particular response to an item. This analysis allowed the researcher to determine how many respondents received in-service training or not. In addition a total score for each respondent was calculated by adding the values of the answers to all the questions. The objective was to arrive at an overall score for all the items combined.

An overall high score (i.e. 12-15) denoted that teachers perceived their level of in-service training of dyslexia to be very good. An overall low score (i.e. 0-6) indicated that teachers perceived their level of in-service training of dyslexia to be inadequate and/or lacking.

Psychometric Properties of the Scale

Psychometric properties of a scale refer to the accuracy with which a construct measures what it sets out to measure or test. Reliability and validity are two types of psychometric properties any test or measuring should have in order for it to be considered a good measure of a construct (De Vos et al., 2005),

Reliability. According to De Vos et al. (2005), reliability refers to the stability or consistency of the measurement. In other words, the measuring instrument is reliable when it can produce the same (or similar) measurements on repeated trials, irrespective of the researcher. Reliability is not concerned with what is measured but how well it is measured. There are several procedures available for testing reliability of an instrument, which include test-retest, alternate form methods and the split-half technique (De Vos et al., 2005).

Reliability is also referred to as internal consistency (internal stability): "Internal consistency is estimated by determining the degree to which each item in a scale correlates with each other item." (Terre Blanche & Durrheim,1999, p.90). Thus internal consistency is an estimate of inter-item correlation. In this study the Cronbach's alpha co-efficient was used to test for internal consistency. As a rule of thumb, questionnaire scales with a (alpha) value greater than 0.8 are considered reliable (Ary, Jacobs, Razavieh & Sorensen, 2006). The questionnaire was pre-tested and reliability was tested using the Statistical Package for Social Sciences (SPSS). The Cronbach alpha reliabilities for items in the different sections of the questionnaire are displayed in Table 1 below:

Table 1

Co-efficient Alpha (α) Scores

Section	Cronbach's alpha
B: Level of Knowledge of Dyslexia	0.797
C: Perception of Identification of Dyslexia	0.886
D: Perception of Management of Dyslexia	0.928
E: Pre-service Training in Dyslexia provided by training institutions	0.984

There were too few cases to test reliability for Section F: In-service Training in Dyslexia.

Validity. Validity is concerned with how well the measuring instrument measures what it sets out to measure. There are three categories of validity: Face validity/content validity, construct validity and criterion validity (De Vos et al., 2005).

a. Face validity is concerned with what the measuring instrument appears (at face value) to measure. Face validity is sometimes also referred to as content validity (De Vos et al., 2005). In this study, face validity was used to validate the items on the questionnaire. Conducting a pilot study (discussed in more detail later) of the questionnaire was used as a means of testing validity in this study. This was done (at face value) by deciding whether or not the items on the questionnaire measured teacher awareness and management of dyslexia.
b. Construct validity involves determining relationships between different theoretically associated constructs (Terre Blanche & Durrheim, 1999). It refers to the uniformity between the questions in a questionnaire and the construct associated with the subject being studied (Terre Blanche & Durrheim, 1999). In this study, for example, construct validity was empirically (via the questionnaire)

tested by testing the relationship between level of education and teacher awareness of dyslexia.

Pilot Study

According to De Vos et al. (2005) a pilot study is a "small scale implementation of the planned investigation in an attempt to bring possible deficiencies to the fore timeously" (p.82). A pilot study was conducted prior to the main investigation in order to test the measuring instrument, namely the questionnaire.

A purposeful sample of 44 currently employed high school teachers at three high schools in the Cape Town region completed the draft questionnaire. A covering letter, which preceded the actual questionnaire, explained the purpose of the study. Participants were verbally instructed (via a school liaison) to comment on the clarity of questions, layout of the questionnaire and suggest possible additional questions or questions that needed to be omitted from the final draft.

The purpose of the pilot study. Pre-testing a questionnaire has a number of advantages. In addition to the advantages mentioned in the opening paragraph of this chapter, it helps to determine if the research hypotheses are appropriate, if any ethical issues have been overlooked, to re-formulate ambiguous questions, to determine the how long it would take participants to complete the questionnaire, and to determine if participants understood the instructions (Siniscalco & Auriat, 2005).

Changes to the original items. After the pilot study was conducted, the questionnaires were reviewed and the necessary amendments were made. Although no items were eliminated completely from the original questionnaire, demographic factors were removed as it became clear after conducting the pilot study that they would not yield any relevant information. An example of such demographical information is that of professional rank of teachers. The researcher believed that this factor would not have any relationship to

teachers' level of awareness of dyslexia. Specifics, such as the wording and clarity of questions on the questionnaires, were restructured before being finalised. Participants in the pilot study expressed some difficulties regarding the wording of certain items and consequently the researcher made amendments to the final questionnaire. For example, the statement: "learners with dyslexia usually experience difficulties with language skills such as spelling and writing" was amended for the purposes of clarity, to read "learners with dyslexia usually experience difficulties with language skills such as spelling" and "learners with dyslexia usually experience difficulties with language skills such as writing" respectively. A few participants stated that they could not respond to the original statement as they agreed with the first concept but disagreed with the latter notion or vice versa. Separating the statements made it easier for the respondents to focus on the two distinct issues at hand.

Summary

In this chapter the researcher discussed the research design, ethical considerations, specifics of the questionnaire, reliability and validity, and the pilot study of the present study.

In Chapter 6 details of the sample (including the sampling technique), the procedure used to collect data and a brief data analysis summary are provided.

Chapter 6: The Main Empirical Study

This chapter details the sample (including the sampling technique), the data collection procedure and a brief outline of the data analysis conducted in this study.

Sample

According to Durrheim (2006), it is generally impossible and/or impractical to study all the cases in a population, and therefore a sample that represents the population is selected for study. The population studied in this research was teachers in mainstream high schools in the Western Cape region (N=7995), and the sample was drawn from this population (Department of Basic Education, 2012).

The sample comprised the 16 schools that agreed to participate in the study. Teachers at all 16 schools were invited to participate in the study but only 194 agreed and therefore received the questionnaire. Since 133 teachers completed and returned the questionnaire, the study had a response rate of 69%.

Sampling technique. A non-probability sampling technique was used to collect data. A broad category of non-probability sampling, called purposive sampling was used in this study. Purposive sampling involves selecting participants who are typical of the population to be studied (Van Vuuren & Maree, 1999). Purposive sampling was deemed the most appropriate sampling technique for this study since participants were selected because of the particular criterion, namely teachers in a mainstream high school. This kind of sampling is also known as judgement sampling, where the researcher makes a judgement about the characteristics of the sample and selects them according to that judgement (Van Vuuren & Maree, 1999).

The main weakness of non-probability sampling is that of generalisability. Generalisation is limited in that the findings may not be transferable to larger populations. However, it can be generalised to the specific population from which the sample was drawn.

According to Johnson (2009), researchers know that when working with non-random samples generalisation is not possible. They overcome this limitation through the use of content/face validity (Johnson, 2009).

Although generalisation of findings based on non-random samples is limited, a description of the phenomenon can be achieved (Van Vuuren & Maree, 1999). The strength of purposive sampling is that it is often used in social science research and is very strong in quality assurance (Fridah, 2002).

Composition of the sample. The sample for the study consisted of 133 teachers, the majority of which were female (*N*=100, i.e. 75%) between the ages of 41-60. The gender split in this study is a fairly accurate reflection of the gender split in the Western Cape Education Department, where the majority (66%) of teachers are female (Department of Basic Education, 2012). The majority of the respondents spoke Afrikaans (*N*=88, i.e. 66%) as their home language. This is again a fair reflection of the home language demographics in the Western Cape, where almost half (48%) of the people in the province speak Afrikaans (South Africa.info, n.d.). It is interesting to note that although the majority of teachers reported that their home language was Afrikaans, they also reported that their main language of teaching was English. This finding is in line with trends in recent years where more parents are opting to place their children in English medium classes even when they speak another language at home. Many of the participants held either a bachelor's degree (*N*=63, i.e. 47%) with a post-graduate teaching qualification or an honours degree (*N*=31, i.e. 23%), and achieved their teaching qualifications between 1976 and 1990, or between 2006 and 2010. Participants who completed their teaching qualification at Stellenbosch University comprised the largest group (*N*=61, i.e. 46%). Since Stellenbosch Univeristy is predominantly an Afrikaans medium university,this result is in line with an earlier finding that showed the majority of respondents were Afrikaans-speaking. Most participants (*N*=70, i.e. 53%) had been teaching for 11 to 30

years and the overwhelming majority (*N*=108, i.e 81%) reported that they taught between 21-40 learners per class. Most of the teachers who participated in this study were drawn from the Metro South (*N*=28, i.e. 21%), Metro North (*N*=27, i.e. 20%) and West Coast (*N*=27, i.e. 20%) educational districts in the Western Cape.

Instructions to respondents. A covering letter, which outlined the purpose of the study, preceded the questionnaire (see Appendix C). The nature of the study and the implications of the findings were explained to the participants. They were informed of approximately how long it would take to complete the questionnaire so that they were in a position to decide whether or not they wanted to participate. They were guaranteed that the information they provided would be kept strictly confidential and their anonymity was ensured. Participants were asked to respond to the questions as truthfully as possible, and last, they were reminded that participation was completely voluntary.

Data Collection Procedure

Permission was granted by the Western Cape Education Department to conduct the study in schools in the greater Western Cape region (see Appendix A). A list of all the public mainstream high schools in the Western Cape was obtained from the Western Cape Education Department's website. Letters from the researcher requesting permission to conduct the research (see Appendix B), in addition to the departmental approval letter (see Appendix A), were emailed to those schools (*N*=347, i.e. 98%) with access to internet in the province. In cases where principals did not have access to email at schools (*N*=8, i.e. 2%), permission to conduct the study was obtained via telephone. In three instances, the school principal granted the researcher permission to conduct the study via personal visits. Permission from all schools was predominantly granted by the principal or a deputy principal, while in a few cases it was granted by the guidance counsellor or another staff member.

Schools and individual participants had a choice of completing the questionnaire either in print form or electronically. However, only two schools completed the questionnaire online.

Data were collected in the following two ways:

a. Schools that completed the questionnaire in print form (*N*=14, i.e. 88%) followed the procedure outlined below:

   Teachers were asked whether they wanted to participate in the study. If they agreed, the school contact person placed questionnaires in their pigeonholes. Teachers were generally given a calendar week to complete the questionnaires. In this way they could complete it in their own time and at their own pace. It was hoped that they would complete the questionnaire as accurately and truthfully as possible, since they were not bound by tight time constraints. Those who completed and returned the questionnaire became part of the sample (*N*=133, i.e. 69%). Dates and times for delivery and collection of the questionnaires were agreed upon by both the researcher and school contact person.

b. Schools that completed the questionnaire electronically (*N*=2, i.e. 12%) followed the procedure below:

   A statistics consultant uploaded the questionnaire on the World Wide Web. Participants who agreed to participate in the study received the link to the website giving them access to the questionnaire. The researcher also provided the participants with details of how to complete the questionnaire online. The results of the completed questionnaire were captured immediately and sent directly to the statistician for analysis. This method of data collection allowed the researcher to reach participants in the greater Western Cape region. This method of completing the questionnaire, however, did not prove a popular choice amongst teachers, even when they had access

to the internet.

Data Analysis

According to De Vos et al. (2005), quantitative data analysis provides an interpretation for answers elicited from a study. Statistical methods which are used to analyse quantitative data, are concerned with categorising, ordering and summarising data into a form which can be interpreted (Terre Blanche & Durrheim, 1999). In other words, the researcher measures the variables and then statistically transforms the data in order to describe them.

Thus quantitative data analysis, which is represented in the form of numbers, enables the researcher to make inferences about the population based on the sample studied. Once data is collected the researcher begins the process of analysis by coding and entering the data. Because coding and entering are labour-intensive tasks, errors may easily occur. Cleaning the data is the process of re-checking that data has been coded and entered correctly. Once the researcher has electronically cleaned the database, the data can be statistically analysed (Terre Blanche & Durrheim, 1999). The researcher then presents the descriptive and inferential statistics.

The researcher in this study employed the help of a statistical consultant to administer an appropriate method to statistically analyse the data. The statistician analysed the captured data to measure the variables in this study using a one-sided sign test and Kruskal-Wallis test. STATA 11 software package was used to analyse the data. The statistician also created tables and graphs to represent the findings. The researcher was then able to interpret these analyses.

Summary

In this chapter the researcher provided an outline of the sampling and data collection procedures.

In the next chapter the findings are presented and discussed.

Chapter 7: Results and Discussion: Testing the Hypotheses

In Chapter 7 the research findings are presented by means of descriptive and inferential statistics. Descriptive statistics are merely descriptions of the data collected, while inferential statistics are the conclusions that can be drawn from the data (Research Methods Knowledge Base, n.d.).

Descriptive Statistics

According to Struwig and Stead (2001), descriptive statistics provide summaries of large amounts of data. There are different types of descriptive statistics such as measures of central tendency and dispersion. Mean, median and mode are measures of central tendency; while standard deviation and range are measures of dispersion. Medians and inter-quartile range, which are presented in the form of tables and box plots, were used in this study to report descriptive statistics. Median represents the middle score of the distribution, and interquartile range is the range of scores that fall in the middle 50% of the scores. The 25^{th} percentile is the middle value of the lower 25% of scores; while the 75^{th} percentile is the middle value of the upper 25% of scores. The interquartile range is thus the difference between the75th percentile and the 25^{th} percentile. The medians and inter-quartile ranges were reported in this study because the data generated from participants' responses were not normally distributed. Means and standard deviations could not be reported. It was therefore appropriate to analyse the data by means of sign and Kruskal-Wallis tests in this study (discussed in the next paragraph).

Inferential Statistics

Inferential statistics are used to make inferences from the data to more general conditions. In other words, inferential statistics are used to make generalisations from the sample to the larger population. Inferential statistics include parametric and non-parametric

statistics. The sign test is a two sample non- parametric test and an alternative to the Wilcoxon test (Handbook of Biological Statistics, n.d.). Where the Wilcoxon test assumes that data is interval; the sign test assumes that data is ordinal; as is the case in this study. It is used when data is not normally distributed. The sign test is a binomial[13] test of difference between the median scores of two samples. It assumes that the number of positive differences is equal to the number of negative differences (Handbook of Biological Statistics, n.d.). The sign test was used to test hypotheses 1, 10, 19, 28 and 33 in this study.

The Kruskal-Wallis analysis of variance test was also used to test null hypotheses in this study. It is a non-parametric test equivalent to the ANOVA (analysis of variance) that assumes the sample data is not normally distributed. It is used to compare the median scores of three or more scores that come from different groups. When data is analysed by means of a Kruskal-Wallis test, a chi-square statistic is used to test for differences in mean ranks (Handbook of Biological Statistics, n.d.). Where the Kruskal-Wallis indicated a significant difference between the median scores of the sample groups, post hoc comparisons were conducted to assess pairwise differences between the groups. The Mann-Whitney test was conducted; controlling for Type 1 error by using the Bonferroni approach (Handbook of Biological Statistics, n.d.). The Kruskal-Wallis test was used to test all the hypotheses (except 1, 10, 19, 28 and 33) in this study.

The hypotheses in this study were grouped in five key areas:

a. Hypotheses Relating to Teachers' Knowledge of Dyslexia: Hypotheses 1-9
b. Hypotheses Relating to Teachers' Perceptions of their Ability to Identify Dyslexia: Hypotheses 10-18
c. Hypotheses Relating to Teachers' Perceptions of their Ability to Manage Dyslexia: Hypotheses 19- 27

[13] Binomial: Algebraic expression referring to the difference of two terms (Handbook of Biological Statistics, n.d.).

d. Hypotheses Relating to Teachers' Perceptions of the Adequacy of Pre-service Training in Dyslexia: Hypotheses 28 – 32
e. Hypothesis Relating to Teachers' Perceptions of the Adequacy of In-service Training in Dyslexia: Hypothesis 33

Hypotheses Relating to Teachers' Knowledge of Dyslexia

A Shapiro-Wilk test is an analysis of variance test for normality. It is used to test whether data is normally or non-normally distributed. The result of the Shapiro-Wilk test is reflected in Table 2 below:

Table 2

Shapiro-Wilk Test for Normality

Variable	Observed	W	V	Z	Probability ≥ z
Knowledge of dyslexia	133	0.97634	2.484	2.05	0.02019

A Shapiro-Wilk test for normality was conducted and the dependent variable, knowledge of dyslexia, was non-normally distributed, W = 0.97634, $p = 0.02$ (≤ 0.05). Based on the finding that data were not normally distributed, a sign test of difference and a Kruskal-Wallis analysis of variance was used to analyse data.

Hypothesis 1: Teachers' knowledge of dyslexia is low. The hypothesis was not supported.

Table 3

Teachers' Knowledge of Dyslexia is Low

Sign	Observed	Expected
Positive	123	66.5
Negative	10	66.5
Zero	0	0
All	133	133

The one-sided sign test with 123 successes out of 133 trials has a p-value of ≤ 0.0001 ($p \leq 0.05$). The results indicated that teachers' knowledge of dyslexia was either adequate or very good. This result is contradictory to literature that claims that teachers have many misconceptions about dyslexia (Wadlington & Wadlington, 2005). It is possible that teachers in the Western Cape acquired their knowledge of dyslexia through pre-service training, in-service training or classroom experience.

Hypothesis 2: There is a significant difference between the median knowledge of dyslexia scores of male and female teachers. The hypothesis was not supported.

Table 4

Knowledge of Dyslexia between Genders

Gender	N	Median	25th Percentile	75th Percentile
Male	30	37	34	41
Female	96	38	35	42
Total	126	38	34	41

A Kruskal-Wallis test revealed no statistical difference between knowledge of dyslexia scores for males and females, χ^2 (1) = 0.365, p = 0.55, at the 0.05 statistical level. Knowledge of dyslexia was found to be similar irrespective of participants' gender. Both groups showed adequate knowledge of dyslexia. This result may be explained by the fact that male and female teachers are exposed to the same pre-service and/or in-service training in special needs education (i.e. dyslexia). This result is congruent with research conducted by Subban (2005) and Tillotson (2011) that showed no significant differences in beliefs about dyslexia between men and women.

Hypothesis 3: There is a significant difference in the median knowledge of dyslexia scores between age groups of teachers. The hypothesis was not supported.

Table 5

Knowledge of Dyslexia Between Age Groups

Age	N	Median	25th Percentile	75th Percentile
21-30 years	39	39	34	42
31-40 years	11	42	38	44
41-50 years	39	36	34	40
51-60 years	34	37	34	39
60+ years	4	37	34	45
Total	127	38	34	41

As shown by the results of the Kruskal-Wallis test there was no statistical difference between knowledge of dyslexia in terms of teachers' age, χ^2 (4) = 7.072, p = 0.13 ($p \leq 0.05$). Although all age groups displayed an adequate knowledge of dyslexia, there was a noticeable difference between the median scores of participants between the ages of 31-40 years

(*Mdn*=42) and those between the ages of 41-50 years (*Mdn*=36). The result that the 'younger' participants had higher median scores than their 'older' counterparts could be explained by the possibility that they received more adequate pre-service training and/or continued in-service training than the participants in the 41-50 age category.

Hypothesis 4: There is a significant difference in the median knowledge of dyslexia scores between teachers' level of education. The hypothesis was not supported.

Table 6

Knowledge of Dyslexia Between Levels of Education

Level of education	N	Median	25th Percentile	75th Percentile
3 year qualification	2	31	30	32
4 year qualification	22	38	36	40
Bachelors+PGCE/equivalent	63	38	32	41
Honours/equivalent	32	38	34.5	41.5
MSc	9	35	35	41
PHD	1	35	35	35
Other	4	36	34	39.5
Total	133	37	34	41

The Kruskal-Wallis test indicated that there was no statistical difference in teachers' knowledge of dyslexia in terms of their level of education, χ^2 (6) = 4.56, p =0.60 at the 0.05 statistical level. In other words, no significant differences were found when teachers were in possession of a three-year teacher's diploma, a bachelor's degree or an honours degree. Although there is no statistical difference between median scores in terms of level of education, the median score of teachers who are in possession of a three year teaching

qualification is lower (more knowledgeable about dyslexia) (*Mdn*=31) than that of any other group. This result may have been skewed because there were only two respondents in the category.

Hypothesis 5: There is a significant difference in the median knowledge of dyslexia scores between teachers who have a qualification in special education and those who only have a general teacher's qualification. The hypothesis was not supported.

Table 7

Knowledge of Dyslexia Between Teachers who have a Qualification in Special Education and those who only have a General Teacher's Qualification

Special Education Qualification	N	Median	25th Percentile	75th Percentile
Teachers with special needs qualification	8	35	32	36.5
Teachers without special needs qualification	125	38	34	41

The results reveal there is no statistically significant difference between the median scores of teachers' knowledge of dyslexia when they have a special needs qualification or not, χ^2 (1) = 2.76, p = 0.10 ($p \leq 0.05$). The median scores indicate that both groups of teachers have an adequate knowledge of dyslexia. The researcher assumed that teachers with a special needs qualification would be more knowledgeable about dyslexia compared to those without such a qualification. The results did not support this assumption. One possibility for this result could be that even though teachers are not in possession of a special needs qualification, they could acquire their knowledge through classroom experience. There is also the possibility that results would prove different if the sample of those teachers who had a special needs qualification was larger.

Hypothesis 6: There is a significant difference in the median knowledge of dyslexia scores between the years in which teachers received their qualification. The hypothesis was not supported.

Table 8

Knowledge of Dyslexia Between Years of Qualification

Year of qualification	N	Median	25th Percentile	75th Percentile
Before 1970	2	42	32	52
1971-1975	4	37	36	39.5
1976-1980	19	36	33	41
1981-1985	21	38	35	38
1986-1990	19	35	32	40
1991-1995	10	39.5	38	42
1996-2000	6	40.5	36	43
2001-2005	5	42	35	46
2006-2010	29	39	35	42
2011	9	39	32	41
Total	124	38	34	41

The results reveal there is no significant difference in teachers' knowledge of dyslexia based on the year in which they received their teaching qualification, χ^2 (9) = 12.32, p = 0.20 ($p \leq 0.05$). Pre-1994, training in special educational needs was largely considered optional for trainee teachers. However, in line with global trends in inclusive education most current South African teacher training courses include compulsory modules in special needs training. The researcher assumed that teachers qualifying post-2000 would be more knowledgeable about dyslexia than those trained pre-2000, but the results in this study did not support this

assumption. The median scores for all age groups ranged from 35-42. This shows that all participants, irrespective of the year in which they qualified, indicated that they had an adequate knowledge of dyslexia. A possible explanation for this result could be due to the following equalising factors: A lack of *experience* regarding recently qualified teachers, and experienced teachers who lack *training*.

Hypothesis 7: There is a significant difference in the median knowledge of dyslexia scores between training institutions. The hypothesis was not supported.

Table 9

Knowledge of Dyslexia Between Training Institutions

Training institution	N	Median	25th Percentile	75th Percentile
Teacher training college	17	38	36	39
UWC	10	36.5	34	39
UCT	13	41	38	42
Stellenbosch	46	37	32	41
UNISA	7	40	32	41
Other	32	38.5	34	42.5
Total	125	38	34	41

Results from the Kruskal-Wallis test indicate that there is no significant statistical difference in teachers' knowledge of dyslexia with regard to the training institution at which they received their qualification, χ^2 (5) = 3.63, p = 0.60 ($p \leq 0.05$). The range of median scores (37-41) for all groups, irrespective of the training institution at which they received their qualification, indicated that participants had an adequate knowledge of dyslexia. Most of

the participants (*N*=98) studied at institutions in the Western Cape and Unisa. Results might have proven different if the sample was larger and teachers had qualified at a wider spread of institutions across the country.

Hypothesis 8: There is a significant difference in the median knowledge of dyslexia scores between the numbers of years a teacher has been teaching. The hypothesis was not supported.

Table 10

Knowledge of Dyslexia Between Years of Teaching Experience

Years of teaching experience	N	Median	25th Percentile	75th Percentile
Less than 1year	10	37.5	34	41
1-5 years	30	36	32	42
6-10 years	10	41	39	46
11-15 years	18	38.5	36	42
16-20 years	16	38	32.5	43
21-25 years	16	37.5	33	40
26-30 years	20	37	35	38
More than 30 years	13	33	31	39
Total	133	37	34	41

The Kruskal-Wallis test shows no statistically significant difference in teachers' knowledge of dyslexia based on the number of years they have been teaching, χ^2 (7) = 9.48, p = 0.22 ($p \leq 0.05$). The researcher assumed that teachers with more than 15 years' experience would be more knowledgeable about dyslexia, either through classroom experience or in-service training, than those who recently (less than 10 years ago) joined the profession. The

results did not indicate this. The median scores (36-41) for all groups indicate that teachers have an adequate knowledge of dyslexia irrespective of the number of years they have been teaching. The implication is that schools should provide ongoing professional development in this area if teachers are to increase their awareness and management levels of dyslexia. This may apply to newly qualified teachers who might enter the profession with adequate knowledge of dyslexia, and older teachers who did not receive initial training. Both groups of teachers are in need of continued training and support.

Hypothesis 9: There is a significant difference in the median knowledge of dyslexia scores between educational districts. The hypothesis was supported.

Table 11

Knowledge of Dyslexia Between Educational Districts

Educational district	N	Median	25th Percentile	75th Percentile
Cape Winelands	5	35	35	39
Eden and Central Karoo	17	37	32	38
Metro Central	11	41	37	43
Metro East	5	24	23	26
Metro South	27	38	35	42
Metro North	27	36	32	42
Overberg	16	38.5	34.5	43.5
Westcoast	25	38	34	41
Total	133	37	34	41

The results of the statistical test showed there was a significant difference in teachers' level of knowledge of dyslexia between educational districts, χ^2 (7) = 21.38, p = 0.00 ($p \leq$ 0.05). Mann-Whitney post hoc comparisons showed significant differences between the

median knowledge of dyslexia scores of those teachers who taught in Eden and Central Karoo (*Mdn*=37) educational district and the Metro East (*Mdn*=24) education district. Based on the median scores of these two districts, teachers in Metro East showed significantly higher awareness levels of dyslexia compared to teachers teaching in Eden and Central Karoo.

Differences were also revealed between the scores of teachers in Metro East (*Mdn*=24) and those in Metro South (*Mdn*=38), Metro North (*Mdn*=36), Overberg (*Mdn*=38.5) and West Coast (*Mdn*=38) educational districts (see Figure 1). Again, based on the median scores of these districts, teachers in Metro East showed significantly higher awareness levels of dyslexia compared to teachers teaching in Metro South, Metro North, Overberg and West Coast districts who displayed an adequate awareness of dyslexia.

An explanation for this finding could be that the different educational districts offer their teachers differing levels of support and training in special needs education. Some districts might offer continued support while others may offer nothing at all. However, the sample size for Eden and Central Karoo is much smaller compared to those of Metro South, Metro North, Overberg and West Coast, and this may have skewed the results.

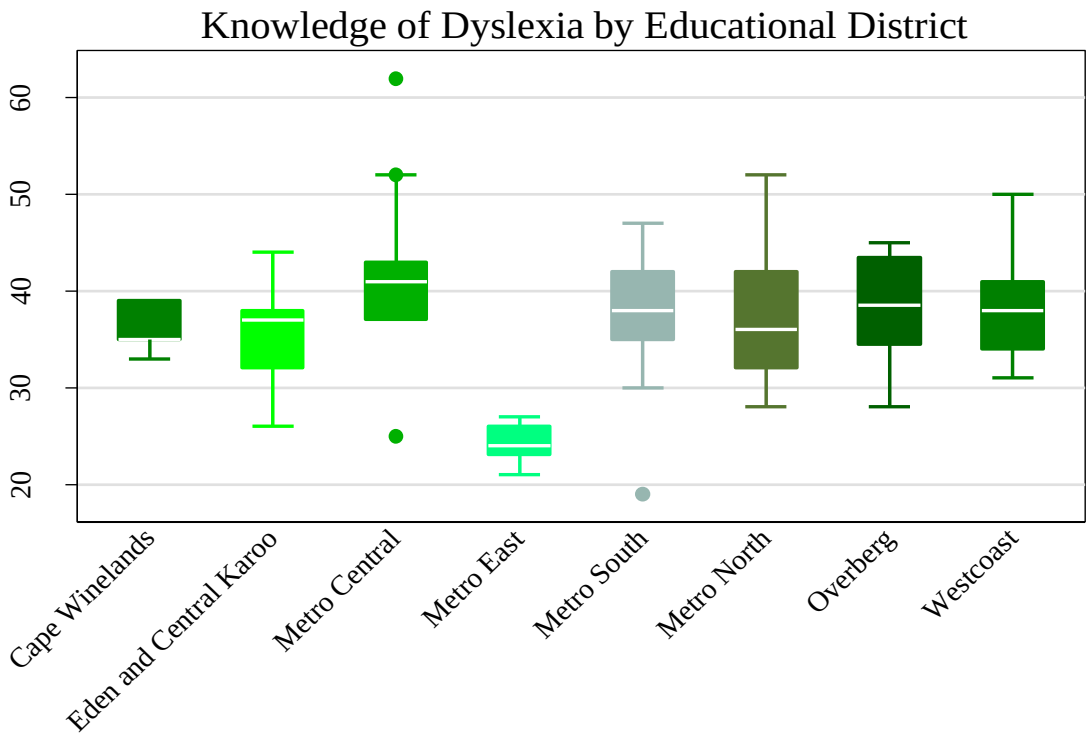

Figure 1: Post hoc comparison for educational district and knowledge of dyslexia

Hypotheses Relating to Teachers' Perceptions of their Ability to Identify Dyslexia

Table 12

Shapiro -Wilk Test for Normality

Variable	Observed	W	V	Z	Probability ≥ z
Ability to identify dyslexia	127	0.96393	3.641	2.904	0.00184

Shapiro-Wilk test for normality was conducted and the dependent variable, teachers' perceptions of their ability to identify dyslexia, was non-normally distributed, W = 0.96393, $p = 0.002$ ($p \leq 0.05$). Based on the finding that data were not normally distributed, a sign test of difference and a Kruskal-Wallis analysis of variance was used to analyse data.

Hypothesis 10: Teachers' perceptions of their ability to identify dyslexia are low. The hypothesis was not supported.

Table 13

Teachers' Perceptions of their Ability to Identify Dyslexia are Low

Sign	Observed	Expected
Positive	112	59.5
Negative	7	59.5
Zero	8	8
All	127	127

The one-sided sign test with 112 successes out of 119 trials has a p-value of ≤ 0.0000 ($p \leq 0.05$). The results indicated that teachers' perceptions of their ability to identify dyslexia were either adequate or very good. This result supports hypothesis 1 that showed teachers' knowledge of dyslexia is adequate or very good. It makes sense that if teachers have adequate knowledge of dyslexia then they would be able to identify the characteristics of dyslexia. The results seem to indicate this. The results, however, do not support current literature that claims teachers are not able to identify the characteristics of dyslexia (Kirby et al., 2005). The

contradiction between the results of this study and existing literature could be explained by the possibility that teachers in this study indicated their *belief* in their ability to identify the characteristics, and not their *actual* ability. Participants in this study were not asked to identify the characteristics, only to say whether or not they believed they could. Results from literature may have been based on actual identification and not perceptions; thus the incongruity.

Hypothesis 11: There is a significant difference in the median perception of ability to identify dyslexia scores of males and females. The hypothesis was not supported.

Table 14

Perception of Ability to Identify Dyslexia Between Genders

Gender	N	Median	25th Percentile	75th Percentile
Male	30	10	9	12
Female	95	10	8	11
Total	125	10	8	12

The Kruskal-Wallis test revealed no statistically significant difference between male and female teachers' perceptions of their ability to identify dyslexia, χ^2 (1) = 0.66, p = 0.42 ($p \leq 0.05$). The median scores indicated that both genders they believed they had an adequate ability to identify dyslexia. This result is congruent with a finding reported earlier in this study (*Hypothesis 2*) where no statistical significance was found between median scores of knowledge of dyslexia of males and females.

Hypothesis 12: There is a significant difference in the median perception of ability to identify dyslexia scores between teachers' age groups. The hypothesis was not supported.

Table 15

Perception of Ability to Identify Dyslexia Between Age Groups

Age	N	Median	25th Percentile	75th Percentile
21-30 years	39	10	8	11
31-40 years	11	7	5	10
41-50 years	38	10	9	11
51-60 years	34	10.5	9	12
60+ years	4	10.5	7.5	12
Total	126	10	8	12

Results of the statistical test show that there is no significant difference in teachers' perceptions of their ability to identify dyslexia across the various age categories, χ^2 (4) = 6.75, p = 0.15 (at 0.05 statistical level). The median scores reflected that teachers in all age groups believed they had an adequate ability to identify dyslexia. A possible explanation that teachers' perceptions of their ability to identify dyslexia did not differ according to age is that younger teachers (21-30 years) acquired training in dyslexia, while older teachers (40 years and older) acquired skills through experience and in-service training. The implication is that even if teachers did not receive specific dyslexia identification training, they are still able to identify the characteristics of dyslexia, and in this way assist the child.

Although median scores reflected a range of 10-10.5 for most age groups, teachers aged 31-40 years indicated a slightly lower ability to identify dyslexia. This could be because this group comprised only 14% (N=11) of the respondents, and thus skewed the results.

Hypothesis 13: There is a significant difference in the median perception of ability to identify dyslexia scores between teachers' level of education. The hypothesis was not supported.

Table 16

Perception of Ability to Identify Dyslexia Between Levels of Education

Level of education	N	Median	25th Percentile	75th Percentile
3 year qualification	2	11.5	11	12
4 year qualification	22	10.5	10	12
Bachelors+PGCE/equivalent	58	10	8	11
Honours/equivalent	31	9	7	12
MSc	9	10	9	11
PHD	1	11	11	11
Other	4	11	10	12
Total	127	10	8	12

A Kruskal-Wallis test of variance on the results shows there is no statistical difference in teachers' perceptions of their ability to identify dyslexia in terms of their level of education, χ^2 (6) = 5.36, p = 0.50 (at 0.05 statistical level of significance). The median scores reflected that teachers believed they had an adequate ability to identify dyslexia irrespective of their level of education. The results imply that even when teachers gained higher qualifications this did not necessarily mean that they acquired more skills in special needs education. The implication of this is that for teachers to improve their skills in special needs education (and especially dyslexia) they should elect courses specifically aimed at improving such skills.

Hypothesis 14: There is a significant difference in the median perception of ability to identify dyslexia scores between teachers who have a qualification in special education and those who only have a general teacher's qualification. The hypothesis was supported.

Table 17

Perception of Ability to Identify Dyslexia Between Teachers who have a Qualification in Special Education and those who only have a General Teacher's Qualification

Special Needs Qualification	N	Median	25th Percentile	75th Percentile
Teachers with special needs qualification	8	12	11	12
Teachers without special needs qualification	119	10	8	11

The results of the statistical test indicated a statistical difference between the perceptions of teachers' ability to identify dyslexia when they were in possession of a special needs qualification and the perceptions of those who were not, χ^2 (1) = 5.43, p = 0.02 (at 0.05 statistical level). The median scores indicated that teachers with a special needs qualification believed they were very capable of identifying dyslexia, compared to teachers without a special needs qualification who indicated their ability to identify dyslexia was only adequate. This result, however, is in contrast to an earlier result *(Hypothesis 5)* that indicates no difference in teachers' perceptions of their knowledge of dyslexia whether they have a special needs qualification or not. This anomaly could be explained by the possibility that teachers' with a special needs education qualification *believe* that they are able to identify dyslexia, but are not necessarily capable of identifying it. Their specialised qualification may account for their perceived confidence levels.

Mann-Whitney post hoc comparisons showed significant differences between the median ability to identify dyslexia scores of those teachers who were in possession of a specialised special needs education qualification and teachers who were not.

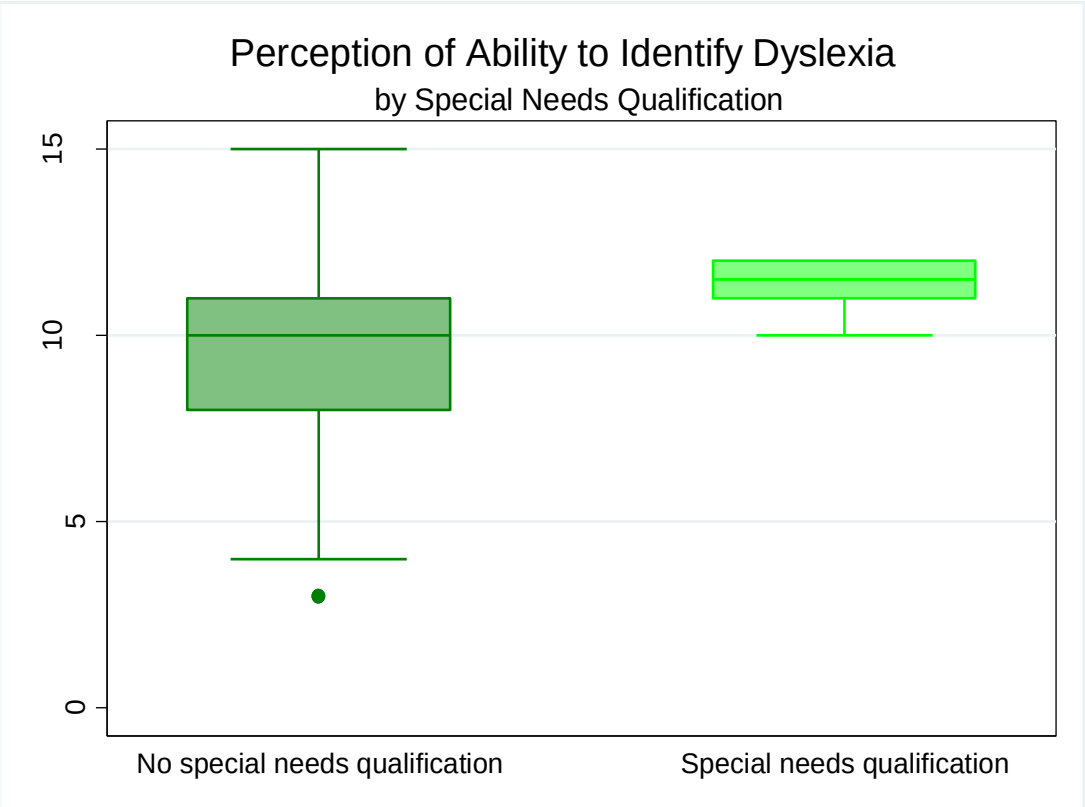

Figure 2: Post hoc comparison for perception to identify dyslexia between teachers who have a special needs qualification and those who do not

Hypothesis 15: There is a significant difference in the median perception of ability to identify dyslexia scores between the years of qualification. The hypothesis was not supported.

Table 18

Perception of Ability to Identify Dyslexia Between Years of Qualification

Year of qualification	N	Median	25th Percentile	75th Percentile
Before 1970	2	10.5	9	12
1971-1975	4	8	6	11
1976-1980	19	10	9	12
1981-1985	20	11	10	12
1986-1990	19	10	9	11
1991-1995	10	10	6	10
1996-2000	6	7	3	12
2001-2005	5	9	9	10
2006-2010	29	10	7	12
2011	9	11	10	11
Total	123	10	8	12

The results of the Kruskal-Wallis test indicated no statistical difference between the perceptions of teachers' ability to identify dyslexia and the year in which they qualified, $\chi^2(9) = 12.59$, $p = 0.18$. The researcher made the assumption that teachers who recently (less than 10 years ago) received their teaching qualification are more skilled in special needs education than those who received their qualification more than 20 years ago. This assumption was made based on the fact that the South African government made a commitment to ensuring inclusive education since signing the Salamanca statement in 1994. The researcher thus assumed that teachers who received their training in the last 20 years

would be advantaged in receiving increased training in special needs education as opposed to those who received their training before government's commitment. The results did not support this assumption. The median scores reflected that teachers believed they had an adequate ability to identify dyslexia irrespective of the number of years they had been teaching. An explanation could be that teachers who qualified recently had studied a once-off elective or short course (at least) in special needs education, thus making them feel relatively capable of identifying dyslexia in the classroom. Older teachers may feel adequate in their ability to identify dyslexia due to classroom experience. Teachers who obtained their qualification from1996-2000 reflected a lower level of confidence (compared to other year groups) in their ability to identify dyslexia. This could be possibly attributed to the fact that this group of respondents comprised only 7% (N=6) of the sample.

Hypothesis 16: There is a significant difference in the median perception of ability to identify dyslexia scores between training institutions. The hypothesis was not supported.

Table 19

Perception of Ability to Identify Dyslexia Between Training Institutions

Training institution	N	Median	25th Percentile	75th Percentile
Teacher training college	17	10	9	12
UWC	9	10	8	10
UCT	13	9	6	11
Stellenbosch	46	10	9	11
UNISA	7	9	8	11
Other	32	11	9	12
Total	124	10	8	12

The results of the Kruskal-Wallis test showed no statistical difference in the median perception of ability to identify dyslexia scores between training institutions, χ^2 (5) = 6.67, p = 0.25 (at 0.05 statistical level). The median scores reflected that teachers believed they had an adequate ability to identify dyslexia irrespective of the training institution at which they received their qualification. This result could imply that the special needs education training offered at the various teacher training institutions in the Western Cape and Unisa is all equally adequate. The result indicates that the researcher cannot assume one training institution offered a more in-depth course than another did. Again, this might only apply to institutions in the Western Cape and Unisa, and may not necessarily be the case countrywide.

Hypothesis 17: There is a significant difference in the median perceptions of ability to identify dyslexia scores between the years a teacher has been teaching. The hypothesis was supported.

Table 20

Perception of Ability to Identify Dyslexia Between Years' Teaching Experience

Number of years' experience	N	Median	25th Percentile	75th Percentile
Less than 1year	10	11	9	11
1-5 years	27	11	9	12
6-10 years	10	8.5	7	10
11-15 years	18	8	6	11
16-20 years	15	10	8	10
21-25 years	15	10	9	11
26-30 years	19	10	9	12
More than 30 years	13	12	10	12
Total	127	10	8	12

Data analysed by means of a Kruskal-Wallis test revealed a statistically significant difference in median perception of ability to identify dyslexia scores in terms of the number of years a teacher has been teaching, χ^2 (7) = 15.37, p = 0.03 (at 0.05 statistical level). The median scores (range 8-11) indicated that all teachers believed they had an adequate ability to identify dyslexia with the exception of teachers who had taught for more than 30 years (*Mdn*=12), who believed they very were capable of identifying dyslexia. A possible explanation for this result is that teachers who have been teaching for more than 30 years may have acquired the skills of dyslexia identification through classroom experience and are therefore confident in their ability to identify the characteristics of dyslexia. The implication

is, however, that teachers' perception of their ability is not necessarily an accurate measurement of their actual ability. However the hypothesis did not measure their actual ability; it measured their perceived ability. Their perceived ability to identify dyslexia may not translate into concrete assistance and support for the dyslexic pupil.

Mann-Whitney post hoc comparisons showed significant differences between the median perception of ability to identify dyslexia scores based on the number of years a teacher has been teaching. Pairwise differences showed differences between the median scores of teachers who had been teaching for six to ten years (*Mdn* = 9) and teachers who had been teaching for more than 30 years (*Mdn* = 12). Based on the differences in median scores, teachers who had been teaching for more than 30 years had more confidence in their ability to identify dyslexia compared to those who had been teaching for six to ten years.

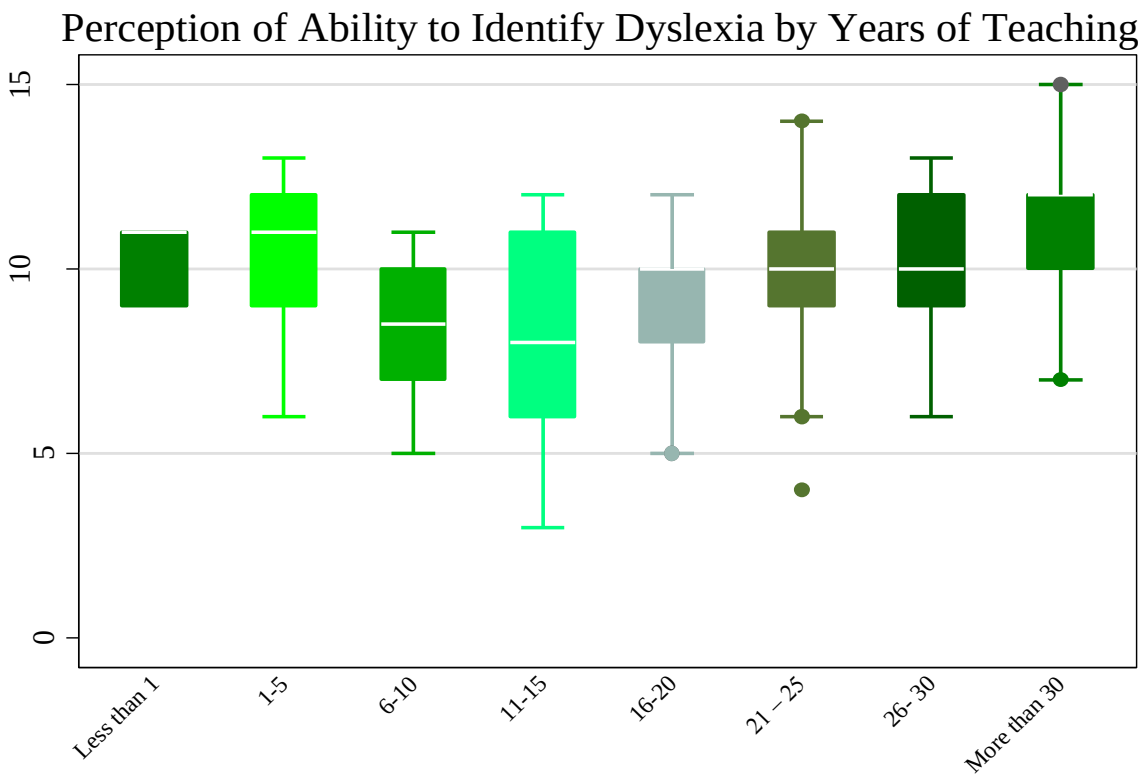

Figure 3: Post hoc comparison of perception of ability to identify dyslexia and years of teaching experience

Hypothesis 18: There is a significant difference in the median perception of ability to identify dyslexia scores between educational districts. The hypothesis was supported.

Table 21

Perception of Ability to Identify Dyslexia Between Educational Districts

Educational district	N	Median	25th Percentile	75th Percentile
Cape Winelands	5	11	11	12
Eden and Central Karoo	17	12	10	12
Metro Central	11	9	6	10
Metro South	26	9	7	11
Metro North	27	10	9	12
Overberg	16	10	6.5	12
Westcoast	25	10	9	11
Total	127	10	8	12

The Kruskal-Wallis test showed a statistically significant difference in median scores of teachers' perception of their ability to identify dyslexia between educational districts, χ^2 (6) = 19.15, p = 0.00 ($p \leq 0.05$). The median scores revealed that teachers from all educational districts in the Western Cape believed they had an adequate ability to identify dyslexia. Only teachers in the Eden and Central Karoo educational district believed they were 'very' capable of identifying dyslexia. Possible reasons for teachers' perceptions of their ability to identify dyslexia include: (a) Teachers in some educational districts received more in-service training than those in other districts (e.g. Eden and Central Karoo, and (b) The sample size of some districts (e.g. Cape Winelands) in this study was very small, which may skew the results in favour of a positive perception of ability to identify dyslexia.

Mann-Whitney post hoc comparisons showed significant differences between the median perception of ability to identify dyslexia scores between some educational districts. Pairwise differences showed differences in the median scores of teachers teaching in Eden and Central Karoo district (*Mdn*=12) and Metro Central district (*Mdn*=9); and Eden and Central Karoo district (*Mdn*=12) and Metro South district (*Mdn*=9). A possible explanation for this finding is that teachers in Eden and Central Karoo district may have received more adequate in-service training in special needs education compared to teachers in Metro Central and Metro South districts. Another possible explanation could also be that the sample size for Eden and Central Karoo district was smaller than Metro South, which may have skewed the results.

The result is in contradiction to the result in Hypothesis 16 that revealed no statistical difference in the median perception of ability identify dyslexia scores between training institutions. This anomaly could be explained by the fact that even though all training institutions appear to offer similarly adequate pre-service training, the level of in-service training offered by educational districts differ: Some educational districts appear to offer little or no training, while others offer adequate training.

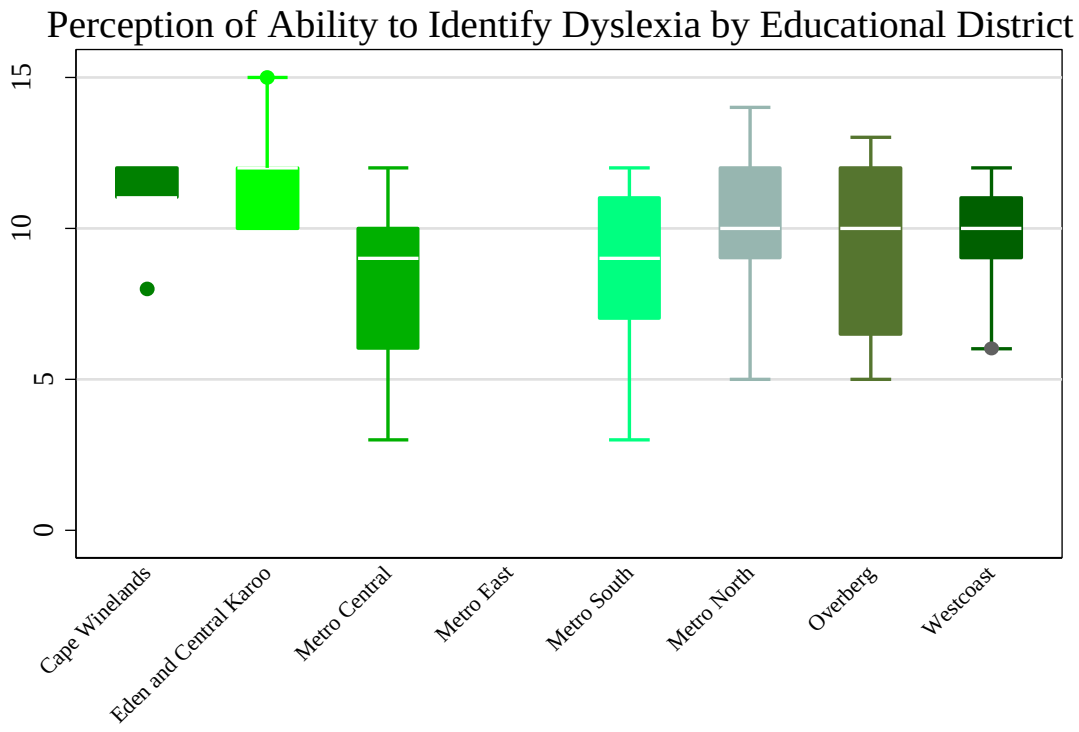

Figure 4: Post hoc comparison of perception of ability to identify dyslexia and educational district

Note: Metro East has missing values

Hypotheses Relating to Teachers' Perceptions of their Ability to Manage Dyslexia

Table 22 below reflects the number of teachers who indicated that they were aware of dyslexic learners in their classes.

Table 22

Number of Teachers who were Aware of Dyslexic Learners in their Classes

Item 43	Frequency	Percentage	Cumulative
Yes	55	41.35	41.35
No	77	57.89	99.25
Missing	1	0.75	100
Total	133	100	

Table 22 above reports that the minority (*N*=55, i.e. 41%) of respondents indicated they were aware of dyslexic learners in their classroom. This result is derived from responses to item 43 where respondents were asked to indicate if they were aware of any dyslexic learners in the classes. This result is not an indication that only 55 teachers had dyslexic learners in their classrooms, but only an indication of how many were aware of such a learner in their class. It does not account for the possibility that there may have been no dyslexic learners in the rest of the teachers' classes.

Table 23

Shapiro - Wilk Test for Normality

Variable	Observed	W	V	Z	Probability ≥ z
Perception of ability to manage	55	0.73855	13.259	5.543	0

A Shapiro-Wilk test for normality was conducted and the dependent variable, teachers' perceptions of their ability to manage dyslexia, was non-normally distributed, W = 0.73855, $p = 0.000$ ($p \leq 0.05$). Based on the finding that data were not normally distributed, a sign test of difference and a Kruskal-Wallis analysis of variance was used to analyse data.

The results that follow reflect the responses of only those respondents who indicated they were aware of dyslexic learners in their class (namely those participants who were currently managing dyslexic learners in their classes).

Hypothesis 19: Teachers' perception of their ability to manage dyslexia is low. The hypothesis was not supported.

Table 24

Teachers' Perceptions of their Ability to Manage Dyslexia are Low

Sign	Observed	Expected
Positive	50	27.5
Negative	5	27.5
Zero	0	0
All	55	55

The one-sided sign test with 50 successes out of 55 trials has a p-value of ≤ 0.0000 (at 0.05 statistical level). The results indicated that teachers' perceptions of their ability to manage dyslexia were either adequate or very good. This result supports hypotheses 1 and 10 that stated teachers' knowledge of dyslexia and ability to identify dyslexic characteristics are adequate or very good. One could assume here that if teachers have adequate knowledge of dyslexia and ability to identify its characteristics, then they are able to manage the dyslexic learner in their classroom. However, knowledge may not translate into practice. Indeed literature that shows teachers are not able to manage dyslexia in the classroom (Kirby et al., 2005). Another possible explanation for this result could be that the sample used to test this

hypothesis was very small (*N*=55) and thus not truly representative of all teachers in the Western Cape. The sample only included those teachers who indicated in the questionnaire that they were aware of dyslexic learners in currently in their classrooms.

Hypothesis 20: There is a significant difference in the median perception of ability to manage dyslexia scores of male and female teachers. The hypothesis was not supported.

Table 25

Perception of Ability to Manage Dyslexia Between Genders

Gender	N	Median	25th Percentile	75th Percentile
Male	12	88	81	94
Female	40	93.5	83	99.5
Total	52	92	83	99

According to the results of the Kruskal-Wallis test, no significant differences were found in the median scores of teachers' perceptions of their ability to manage dyslexia of male and female teachers, χ^2 (1) = 1.96, p = 0.16 (at 0.05 statistical level). The median scores of both males and female teachers indicated their belief they had an adequate ability to manage dyslexia in their classrooms. This result supports an earlier hypothesis of this study (*Hypothesis 11*) that also indicated there was no statistical difference between the perception of male and female teachers' ability to identify dyslexia in the classroom. This result could be explained by the fact that male and female teachers' perceptions of management are based on their knowledge levels of dyslexia; and if they have adequate knowledge levels, their confidence levels in managing dyslexia are also similar.

Hypothesis 21: There is a significant difference in the median perception of ability to manage dyslexia scores between teachers' age groups. The hypothesis was not supported.

Table 26

Perception of Ability to Manage Dyslexia Between Age Groups

Age	N	Median	25th Percentile	75th Percentile
21-30 years	14	95	93	100
31-40 years	2	89	83	95
41-50 years	22	90.5	82	94
51-60 years	15	90	83	100
Total	53	92	83	99

The results of the Kruskal-Wallis test indicated that there are no significant differences in the median scores of teachers' perceptions of their ability to manage dyslexia between different age groups, χ^2 (3) = 4.23, p = 0.24 ($\leq$ 0.05). The median scores indicate that respondents across all age groups believed they had an adequate ability to manage dyslexia in their classrooms. This result could be attributed to the fact that the younger teachers believed they were capable of managing dyslexia due to possible recent pre-service training, while older teachers believed they were capable of managing dyslexia due to years of classroom experience.

Hypothesis 22: There is a significant difference in the median perception of ability to manage dyslexia scores between teachers' level of education. The hypothesis was not supported.

Table 27

Perception of Ability to Manage Dyslexia Between Levels of Education

Level of education	N	Median	25th Percentile	75th Percentile
4 year	7	95	73	99
Bachelors+PGCE/equivalent	25	88	77	99
Honours/equivalent	16	91.5	87	94
MSc	2	104	94	114
PHD	1	111	111	111
Other	4	90.5	89	101
Total	55	91	82	99

The Kruskal-Wallis test of variance revealed no statistical differences in median of perception of ability to manage dyslexia scores between teachers' level of education, χ^2 (5) = 5.16, $p = 0.4$ ($p \leq 0.05$). The median scores indicate that respondents across at all educational levels believed they had an adequate ability to manage dyslexia in their classrooms. This implies that a teacher who has obtained a doctoral degree is not necessarily better equipped to manage dyslexia than a teacher who has obtained a four-year teaching qualification. A possible explanation is that, although general degrees and/or teaching qualifications may provide sufficient theoretical knowledge they do not necessarily equip teachers with the necessary practical skills. It is clear that teaching qualifications at all levels need to include specific practical compulsory modules or components in the field of special needs education.

Hypothesis 23: There is a significant difference in the median perception of ability to manage dyslexia scores between teachers who have a qualification in special education and those who only have a general teacher's qualification. The hypothesis was not supported.

Table 28

Perception of Ability to Manage Dyslexia Between Teachers who have a Qualification in Special Education and those who only have a General Teacher's Qualification

Special Needs Education	N	Median	25th Percentile	75th Percentile
Teachers who have special needs qualification	49	91	82	96
Teachers who do not have special needs qualification	6	98	90	103

The Kruskal-Wallis test of variance revealed no statistical differences in the perception of ability to manage dyslexia scores between teachers who are in possession of a special needs qualification and those who are not, χ^2 (1) = 3.51, p = 0.06 ($p \leq 0.05$). However, teachers who were not in possession of a qualification in special educational needs displayed a higher median score *(Mdn=98)* than teachers who were indeed in possession of one. This contradiction in the results could be explained by the fact that teachers believed in their capabilities in managing dyslexia even in the absence of a specialised qualification.

Hypothesis 24: There is a significant difference in the median perception of ability to manage dyslexia scores between the years in which teachers received their qualification. The hypothesis was not supported.

Table 29

Perception of Ability to Manage Dyslexia Between Year of Qualification

Year of qualification	N	Median	25th Percentile	75th Percentile
1971-1975	1	96	96	96
1976-1980	6	83.5	77	90
1981-1985	13	86	73	103
1986-1990	14	91.5	88	94
1996-2000	2	89	83	95
2001-2005	2	102	93	111
2006-2010	10	95	91	100
2011	2	98.5	98	99
Total	50	92	83	99

The results of the Kruskal-Wallis test indicated no statistical difference between the median of perception of ability to manage dyslexia scores and the years in which teachers received their teaching qualification, χ^2 (7) = 6.92, p = 0.44 (at 0.05 statistical level). The researcher assumed that teachers who qualified recently (post-1994, and the signing of the Salamanca statement), studied special needs education as a component of their training course and would thus show a higher median score than those who trained pre-1994. However, the median scores indicated all respondents believed they had an adequate ability to manage dyslexia in their classrooms. This implies that, irrespective of the years in which teachers received their qualification or whether or not they received special needs training,

their perceptions of their ability to manage dyslexia did not differ. Confidence in dyslexia management may be due to training or to classroom experience, but not the year of qualification in itself.

Hypothesis 25: There is a significant difference in the median perception of ability to manage dyslexia scores between training institutions. The hypothesis was not supported.

Table 30

Perception of Ability to Manage Dyslexia Between Training Institutions

Perception of ability to manage dyslexia	N	Median	25th Percentile	75th Percentile
Teacher training	9	88	82	91
UWC	1	78	78	78
UCT	5	82	80	86
Stellenbosch	19	96	91	109
UNISA	2	88	77	99
Other	14	93.5	88	100
Total	50	92	83	99

Data analysed by means of a Kruskal-Wallis test revealed no statistically significant difference in median of perception of ability to manage dyslexia scores between training institutions, χ^2 (5) = 8.72, p = 0.12 (at 0.05 statistical level). The median scores indicate that respondents believed they had an adequate ability to manage dyslexia in their classrooms. This result implies that irrespective of the training institution at which teachers received their qualification, teachers did not feel more or less confident in their ability to manage dyslexia in the classroom. It could mean that training institutions in the Western Cape do not differ in the type of course they offer; whether it adequately trains teachers in special needs education or not.

Hypothesis 26: There is a significant difference in the median perception of ability to manage dyslexia scores between the years' teaching experience. The hypothesis was not supported.

Table 31

Perception of Ability to Manage Dyslexia Between Years' Experience

Number of years' experience	N	Median	25th Percentile	75th Percentile
Less than 1 year	1	98	98	98
1-5 years	12	94	91	99.5
6-10 years	4	85	78.5	91.5
11-15 years	8	94.5	82.5	99.5
16-20 years	6	90	84	99
21-25 years	9	91	73	94
26-30 years	10	88	75	109
More than 30 years	5	88	85	92
Total	55	91	82	99

According to the results of the Kruskal-Wallis test there was no statistical difference in median of perception of ability to manage scores based on years of teaching experience, χ^2 (7) = 4.96, p = 0.67 (at 0.05 statistical level). The median scores indicate that respondents believed they had an adequate ability to manage dyslexia in their classrooms irrespective of the number of years they taught. Here again, the researcher assumed that teachers who had been teaching for many years (more than 20), would believe they are more capable of managing dyslexia than teachers who do not have as much teaching experience (less than five years). The lack of a statistical difference could be the result of perceived teacher confidence irrespective of the years teachers have taught. Teachers teaching for many years might

believe that they have sufficient classroom experience, while teachers who recently qualified might believe that they have sufficient training to manage dyslexia.

Hypothesis 27: There is a significant difference in the median perception of ability to manage dyslexia scores between educational districts. The hypothesis was not supported.

Table 32

Perception of Ability to Manage Dyslexia Between Educational Districts

Perception of ability to manage dyslexia	N	Median	25th Percentile	75th Percentile
Cape Winelands	4	94	65	112.5
Eden and Central	12	94	87	99.5
Metro Central	3	91	0	109
Metro East	2	0	0	0
Metro South	8	82	79	93
Metro North	13	94	92	100
Overberg	8	86.5	83.5	91
Westcoast	5	96	94	96
Total	55	91	82	99

The results of the Kruskal-Wallis test of variance revealed that there was no statistical difference in the median of perception of ability to manage dyslexia scores between educational districts, χ^2 (7) = 12.65, p = 0.08 ($p \leq 0.05$). This result contradicts the result of a previous hypothesis in this study (*Hypothesis 18*) that indicated there was a statistical difference in teachers' perception of their ability to identify dyslexia and educational district. The researcher assumed that if teachers believe they are capable of identifying dyslexia, then they should also be capable of managing dyslexia. However, the median scores of this

hypothesis corroborated the median scores of Hypothesis 18 where respondents believed they had an adequate ability to manage dyslexia in their classrooms. Thus the median scores appear to support the researcher's assumption. The contradiction between the statistical difference and median scores for Hypothesis 18 and 27 could be explained by the large difference in sample size for the two hypotheses tested.

Hypotheses Relating to Teachers' Perceptions of the Adequacy of Pre-service Training in Dyslexia

Participants were asked to indicate whether or not they had received pre-service training in dyslexia. Table 33 below reflects that the vast majority of respondents (82%) believed they did not receive any pre-service training on the subject at all.

Table 33

Number of Respondents who Received Pre-service Training

Pre-service training	Number	Percentage	Cumulative
Yes	16	12.60	12.60
No	104	81.89	94.49
Missing	7	5.51	100
Total	127	100	

It can be assumed from respondents' perceptions that pre-service training in dyslexia in South Africa is either poor or non-existent. Although the sample size tested for this hypothesis was small, this finding is supported by similar findings from studies conducted internationally. Even in countries (or programmes) where teachers did receive pre-service training, training was quite limited. Caroll et al. (2003), report that there is a serious lack of pre-service training in the field of dyslexia. Teachers in Northern Ireland and Scotland stated that they

"did not believe their professional training had prepared them to meet the challenge of inclusive education" (Caroll et al., 2003, p. 66). Carvalhais and Fernandes da Silva (2010) conducted a study in Portugal and found that 66 percent of participants reported that they had never received any kind of training in dyslexia. The above research indicates a desperate need for quality pre-service training in dyslexia.

The results reported for the hypotheses below for *only those respondents* (*N* =16) who indicated they *had indeed* received pre-service training in dyslexia.

Table 34

Shapiro - Wilk Test for Normality

Variable	Observed	W	V	Z	Probability ≥ z
Pre service training in dyslexia	16	0.94137	1.188	0.342	0.36608

A Shapiro-Wilk test for normality was conducted and the dependent variable, teachers' perceptions of adequate pre-service training, was non-normally distributed, W = 0.94137, $p = 0.366 \leq 0.05$). Based on the finding that data were not normally distributed, a sign test of difference and a Kruskal-Wallis analysis of variance was used to analyse data.

Hypothesis 28: Teachers believed that the pre-service training they received was inadequate. The hypothesis was not supported.

Table 35

Teachers' Belief about the Adequacy of the Pre-service Training they Received

Sign	Observed	Expected
Positive	11	6.5
Negative	2	6.5
Zero	3	3
All	16	16

The one-sided sign test with 11 successes out of 13 trials has a p-value of ≤ 0.0112 ($p \leq 0.05$). The results of the statistical test indicated that those teachers who had indeed received pre-service training in dyslexia, believed their training was adequate to good. The researcher made the assumption that when teachers receive adequate pre-service training in dyslexia, they feel more equipped to identify and manage dyslexia in the classroom. This confidence in ability to identify and manage dyslexia had a strong positive correlation to the academic achievement of the dyslexic learner (Chong et al., 2007). The results of this hypothesis support that assumption.

Even though the sample size (N=16) is very small and thus not representative of the larger teacher population in the Western Cape, it is indicative of the fact that the majority of teachers are not receiving any pre-service training in dyslexia. Thus it is imperative that all teachers not only receive pre-service training but that it is effective and ongoing.

Hypothesis 29: There is a significant difference in the median perception of adequate pre-service training in dyslexia scores between teachers' age groups. The hypothesis was not supported.

Table 36

Perception of Adequate Pre-service Training Between Age Groups

Age	N	Median	25th Percentile	75th Percentile
21-30 years	7	12	6	12
31-40 years	1	8	8	8
41-50 years	3	9	3	10
51-60 years	5	9	6	11
Total	16	9	6	12

The Kruskal-Wallis test of variance revealed no statistical difference in the median perception of adequate pre-service training in dyslexia scores between age groups of teachers, χ^2 (3) = 1.65, p = 0.65 ($p \leq 0.05$). The researcher assumed that older teachers (40 years and over) received their training more than 20 years ago, while younger teachers (under 30 years) less than 10 years ago. The researcher further assumed that teachers, who recently received their teacher training (10 years ago) received more adequate pre-service training in dyslexia than those who were trained more than 20 years ago. Although there was no statistical difference of median scores between the age groups, the median scores themselves indicated that teachers between the ages of 21-30 believed they had received good quality pre-service training in the field of dyslexia. This implies that teachers in this age group probably qualified in more recently than their older (40 and over) colleagues. It is possible that the median scores of teachers aged 21-30 is a reflection that policy and implementation on special needs education in South Africa has improved since 1994 when the Salamanca statement was signed in Spain.

Hypothesis 30: There is a significant difference in the median perception of adequate pre-service training in dyslexia scores between teachers' level of education. The hypothesis was not supported.

Table 37

Perception of Adequate Pre-service Training Between Levels of Education

Level of education	N	Median	25th Percentile	75th Percentile
4 year qualification	7	9	6	12
Bachelors+PGCE/equivalent	3	8	6	9
Honours/equivalent	6	10.5	6	12
Total	16	9	6	12

The results of the Kruskal-Wallis test indicated no statistical difference in the median perception of adequate pre-service training in dyslexia scores between teachers' level of education, χ^2 (2) = 0.78, p = 0.68 (at 0.05 statistical level). This implies that irrespective of educational level, teachers did not differ in their perception that the teacher training they received was adequate.

Hypothesis 31: There is a significant difference in the median perception of adequate pre-service training in dyslexia scores between the years in which teachers received their qualification. The hypothesis was not supported.

Table 38

Perception of Adequate Pre-service Training Between Years of Qualification

Year of qualification	N	Median	25th Percentile	75th Percentile
1976-1980	4	8.5	5.5	11.5
1981-1985	1	9	9	9
1986-1990	2	6.5	3	10
1996-2000	1	8	8	8
2006-2010	6	10	6	12
2011	2	11	9	13
Total	16	9	6	12

The results of the Kruskal-Wallis test showed no statistical difference in the median perception of adequate pre-service training of dyslexia scores and the years in which teachers received their qualification, χ^2 (5) = 2.47, p = 0.78 ($p \leq 0.05$). The researcher assumed that teachers who received their teacher training qualification post-1994 would believe they had received adequate training in special needs education compared to teachers who received

their qualification pre-1994. A possible explanation for the lack of statistical difference between years of qualification may be that even when teacher training courses post 1994 included special needs modules or components, they were not sufficiently in depth for teachers to feel confident about the identification and management of dyslexia.

Hypothesis 32: There is a significant difference in the median perception of adequate pre-service training in dyslexia scores between training institutions. The hypothesis was not supported.

Table 39

Perception of Adequate Pre-service Training Between Training Institutions

Training institution	N	Median	25th Percentile	75th Percentile
Teacher training college	3	8	6	9
Stellenbosch	4	8	5.5	10.5
UNISA	1	9	9	9
Other	8	12	7	12
Total	16	9	6	12

The results of the statistical test of variance revealed no significant difference in the median perception of adequate pre-service training of dyslexia scores and training institutions, χ^2 (3) = 2.17, p = 0.54 (at 0.05 significance level). This could imply that training institutions in the Western Cape do not differ in the depth and breadth of the course they offer. The median scores did, however, reflect that teachers, who trained at institutions other than Unisa or those in the Western Cape, believed they had received very good pre-service training. This could mean that special needs education components of teacher training courses at Western Cape institutions and Unisa are not on par with the rest of South Africa.

Hypothesis Relating to Teachers' Perceptions of the Adequacy of In-service Training in Dyslexia

Table 40

Number of Respondents who Believed they Received Adequate In-service Training

In-Service training	Number	Percentage	Cumulative
Yes	8	6.30	6.30
No	116	91.34	97.64
Missing	3	2.36	100
Total	127	100	

Results in Table 40 show that the overwhelming majority (91%) of teachers believed they did not receive in-service training in dyslexia. This finding is in line with an earlier finding that revealed the majority (82% - refer to Table 33) of teachers did also not receive pre-service training. The former result in itself is an indication that in-service training in special needs education (i.e. including dyslexia) in mainstream high schools is seriously lacking. Although there is a lack of related or similar research in the South African context, the results in this study support international trends in this regard. However, even research conducted internationally is limited. The provision of in-service training is largely seen to be the responsibility of the school management team (Wadlington & Wadlington, 2005). It is the duty of the school's leadership team to recognise the value of ensuring that their teachers are adequately trained in the field of dyslexia to equip teachers with the skills necessary to assist learners. According to Wadlington and Wadlington (2005), school management does not play an important enough role in teacher awareness of dyslexia. Research shows that high levels of pre-service and in-service training are needed for the proper implementation of inclusive education (Hay et al., 2001).

Table 41 below reflects the beliefs of only six participants who reported they had received in-service training in dyslexia. The sample size is extremely small to warrant any valid results.

Hypothesis 33: Teachers believed that the in-service training they received was inadequate. The hypothesis was supported.

Table 41

Teachers' Belief about the Adequacy of the In-service Training they Received

Sign	Observed	Expected
Positive	5	3
Negative	1	3
Zero	2	2
All	8	8

The one-sided sign test with 5 successes out of 6 trials has a p-value of ≤ 0.1094 ($p \leq 0.05$). This is congruent with literature that reports that in-service training in the field of dyslexia is lacking (Robuck, 2007). The results indicate that teachers, who had indeed received in-service training in the field of dyslexia, felt that the training they received was inadequate.

Summary

This chapter offered a detailed presentation and discussion of the results. The next chapter provides the conclusions, including the implications and limitations of the findings, recommendations for practice and suggestions for future research.

Chapter 8: Conclusions

In the previous chapter the study's findings were presented and discussed. In this chapter, the purpose and aims are re-stated, the implications and limitations of the findings are discussed and explored and suggestions for educational practise and future theoretical research are offered.

Aims of the Study

The purpose of the study was to determine the level of teacher awareness of dyslexia in mainstream South African high schools.

The study had five main aims:

1. To determine teachers' level of knowledge of dyslexia in mainstream schools in the Western Cape, South Africa.
2. To determine teachers' perceptions of their ability to identify dyslexic characteristics in their learners.
3. To determine teachers' perceptions of their ability to manage dyslexic learners in their classrooms.
4. To assess teachers' perceptions of the quality of pre-service training offered by training institutions, in the field of dyslexia.
5. To assess teachers' perceptions of the quality of in-service training offered by schools, in the field of dyslexia.

Implications of the Findings

The implications of the findings are presented in four key areas: Knowledge and identification of dyslexic characteristics; management of dyslexia in the classroom; pre-service training in dyslexia; and in-service training in dyslexia. Implications include recommendations for training institutions and school management teams.

Knowledge and identification of dyslexia. The findings show that, contrary to the literature, teachers in mainstream high schools in the Western Cape believed they had adequate knowledge of dyslexia (*Hypothesis 1*). They also show that teachers believed they had the ability to identify dyslexic characteristics (*Hypothesis 10*). The implication of these findings is that if teachers have adequate knowledge and awareness, they are then in a good position to be able, at least, to identify dyslexic characteristics or traits, or refer learners with suspected dyslexia for appropriate evaluation. The implication of this is that learners in the Western Cape have the advantage of being taught by teachers who are at least knowledgeable about the disability.

Management of dyslexia in the classroom. The findings show that, contrary to the literature, teachers in mainstream high schools in the Western Cape believed they had the ability to manage dyslexia in the classroom (*Hypothesis 19*). However, this result is based on the responses of only those teachers who indicated they were aware of any dyslexic learners in their current classes. The sample size for this group of teachers was relatively small (*N*=55), and thus it is not possible to generalise the findings to the wider mainstream high school population in the Western Cape. Nevertheless, implications are promising when teachers believe they can manage dyslexia in the classroom. We can assume that dyslexic learners in mainstream public schools in the Western Cape are getting the necessary remediation and support they need (in the classroom) to succeed academically. On the contrary, it can be argued that the study only tested teachers' perceptions of their ability to manage dyslexia in the classroom; it did not test the perceptions of learners and their parents, who may differ in their opinion of whether or not teachers are managing dyslexia effectively.

Pre-service training in dyslexia. It was found that most teachers did not receive any pre-service training in dyslexia at all. Only a very small percentage of the sample studied (*N*=16) (*Hypothesis 28*) indicated they had indeed received pre-service training in dyslexia.

Interestingly these participants considered their training to be adequate, and research shows that training in learning disabilities (e.g. dyslexia), leads to greater teacher confidence, which in turn leads to greater academic success for the dyslexic child (Chong et al., 2007). This further implies that training institutions need to invest extra resources (personnel, time and money) to ensure that all teacher trainees receive the necessary training. Training institutions need to reconsider how they currently provide pre-service training, and whether it is adequately addressing the needs of the learners trainees will ultimately teach.

However, in contrast, results of other hypotheses in this study *(Hypotheses 1 and 10)* revealed that teachers still believed they had adequate knowledge of dyslexia and can identify its characteristics. Teachers may have obtained their knowledge of and ability to identify dyslexia purely through classroom experience and not pre-service training. The implication is that classroom experience and in-service training are equally important as pre-service training in the development of a skilled teaching force.

A recommendation is that pre-service training in dyslexia, and other special needs education areas should be a compulsory part of pre-service training curricula; it should not be offered as an elective or optional module. Understandably in a one-year post-graduate training course it is difficult to do justice to all areas of special needs education. But in the case of a four-year Bachelors of Education degree, pre-service training in special needs education should be provided in every year of the degree.

A second recommendation is linked to the first. Pre-service training in dyslexia and other special educations needs areas should be made compulsory for all subject teachers, not only language teachers. Too many non-language teachers do not acknowledge the role they have to play in the identification and management of dyslexia in the classroom (Peer and Reid, 2001). It is important that all subject teachers are equipped to deal with dyslexia as the disability does not only present in language classes. According to Peer and Reid (2001) who

conducted research in the UK, non-language teachers have an unrealistic expectation that the Special Needs co-ordinator and the English subject teacher are the only ones responsible for supporting dyslexic children.

In-service training in dyslexia. Only 4% of the total number of participants reported that they received good quality training in dyslexia. The first implication is that if so many teachers go without training, the dyslexic learner is disadvantaged because his or her teacher may not possess the necessary awareness and skills to manage their special educational needs.

The second issue is that of teachers who received training only because they opted to receive such training. The assumption here is that the vast majority of teachers do not see the need to equip themselves with the knowledge and skills to manage dyslexia in their classrooms. The implication is that most dyslexic learners in South Africa are taught by teachers who do not have the appropriate tools to effectively manage dyslexia; even if a management strategy is simply to know the protocol to be followed if one suspects a child of having dyslexia.

The third issue is that the reported results, of high levels of teacher confidence and belief in their abilities, is misplaced. Teachers in this study may have over-estimated their ability to manage the learner adequately for academic success.

Special needs support unit. Based on the need for continued in-service training and support, the creation of a Special Needs Support Unit in every school in the country is imperative. Government should employ learning support teachers qualified to support the dyslexic pupil in a more individualised structured programme; one that the classroom teacher cannot provide. This kind of unit would comprise a group of support staff who are responsible for the academic, social and emotional well-being of the learners. The unit could

include two remedial teachers (one for the GET[14] phase and one for the FET[15] phase) whose sole responsibility it would be to work with learners who are have reading, spelling and comprehension difficulties. In addition to these support personnel, the unit could include a school counsellor and/or educational psychologist to deal with children experiencing social and emotional difficulties.

These services should not only be reserved for those learners who attend schools that can afford to pay extra support teachers from school fees – it should be a given that every state school has this kind of team/unit as part of their staff establishment.

Limitations of the Study

The study presented the following limitations:

Sample size, bias and generalisability. The sample was biased in two ways: a) Although participants were drawn from both urban and rural schools, the sample consisted mainly of teachers teaching at ex-Model C schools, with only some participants from previously disadvantaged schools; b) Since respondents opted to participate in the study, it was a self-selected group, thus resulting in a biased process.

Results of the study are thus not necessarily a reflection of the perceptions of all teachers in the Western Cape. A larger, more reflective sample drawn from many more schools may have allowed the researcher to generalise the findings of the study to the greater Western Cape.

Response bias. Participants may have responded to the questions in the questionnaire in a manner in which they believed the researcher wanted them to respond. This could be especially true when they had to respond to statements testing their knowledge of dyslexia, and when they were asked to rate their beliefs about their ability to identify and manage

[14] GET phase: General Education and Training phase (Grades 7-9)
[15] FET phase: Further Education and Training phase (Grades 10-12)

dyslexia. This kind of bias could have accounted for the fact that results in this study differed from results in literature.

Extraneous variables. The researcher was informed that in some instances principals gave teachers a very short period in which to complete the questionnaire (in one case teachers were asked to complete the questionnaire only when the researcher arrived to collect them). This could imply that teachers, because they were rushed, did not complete the questionnaire properly and/or truthfully. The kind of situational extraneous variable could have negatively affected the results.

Lack of qualitative questions. Qualitative questions would have provided the researcher greater insight into teachers' perceptions of how they manage dyslexia in the classroom (i.e. specific strategies).

Use of the Likert scale. The Likert scale has a number of disadvantages. The first disadvantage involves the number of options included in the scale; five, seven or even nine options may be too few for some participants. A second disadvantage is that participants may become influenced by the way they respond to previous items, and continue to answer in the same vein throughout the questionnaire (i.e. response set). This pattern can be broken by the use of positive and negative statements.

Limitation of statistical method. A limitation of the Kruskal-Wallis test (used in this study) is that it does not indicate individual differences when the null hypothesis is rejected; differences are tested collectively.

Suggestions for Future Research

The following areas for future study emerged from this study: (a) Identification and management of dyslexia in the classroom; (b) Training institutions' commitment to providing pre-service training in dyslexia; (c) Comparative studies of teacher training courses offered by institutions in South Africa; (d) School managements' commitment to providing in-service

training in dyslexia; (e) Studies in other contexts.

Identification and management of dyslexia in the classroom. Further research could be conducted as to the reasons why teachers had adequate knowledge of dyslexia even though they indicated they did not receive adequate pre-service or in-service training.

Training institutions' commitment to providing pre-service training. An evaluation of the kind of pre-service training in dyslexia (and other learning disabilities) that institutions are currently providing should be carried out. Although this study was conducted in the Western Cape, respondents who were trained in other provinces, as well as other countries, also participated. An evaluation of teacher trainee programmes of all South African teacher training institutions and courses should be conducted.

Comparative studies of teacher training courses offered by institutions in the Western Cape. Comparative studies between the different teacher training courses offered by the various institutions in the South Africa could also be conducted so as to determine if teachers who were trained at institutions other than Unisa and in the Western Cape also felt that they did not receive adequate pre-service training in dyslexia.

School managements' commitment to providing in-service training. Research should be led into the reasons for the lack of adequate in-service training in dyslexia in high schools. Research could investigate if school management teams are reluctant to offer continued support due to apathy towards the disability or an unwillingness to fund such training.

Studies conducted in other contexts. Since this study was only performed in state high schools in the Western Cape, the study could be carried out in other contexts as well. Further studies could be done in private schools, primary schools and the other eight provinces in the country. Comparative studies between these contexts would shed more light on this topic.

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Appendix A: Permission from WCED to Conduct Research

RESEARCH

WESTERN CAPE
Education Department
Provincial Government of the Western Cape

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Fax: 0865902282
Private Bag x9114, Cape Town, 8000
wced.wcape.gov.za

REFERENCE: 20110811-0022
ENQUIRIES: Dr A T Wyngaard

Mrs Lynette De Long
23 Amandel Road
Westridge
7785

Dear Mrs Lynette De Long

RESEARCH PROPOSAL: DYSLEXIA: AN INVESTIGATION OF TEACHER AWARENESS IN SOUTH AFRICAN MAINSTREAM HIGH SCHOOL SETTINGS

Your application to conduct the above-mentioned research in schools in the Western Cape has been approved subject to the following conditions:

1. Principals, educators and learners are under no obligation to assist you in your investigation.
2. Principals, educators, learners and schools should not be identifiable in any way from the results of the investigation.
3. You make all the arrangements concerning your investigation.
4. Educators' programmes are not to be interrupted.
5. The Study is to be conducted from **16 January 2012 till 23 March 2012**
6. No research can be conducted during the fourth term as schools are preparing and finalizing syllabi for examinations (October to December).
7. Should you wish to extend the period of your survey, please contact Dr A.T Wyngaard at the contact numbers above quoting the reference number.
8. A photocopy of this letter is submitted to the principal where the intended research is to be conducted.
9. Your research will be limited to the list of schools as forwarded to the Western Cape Education Department.
10. A brief summary of the content, findings and recommendations is provided to the Director: Research Services.
11. The Department receives a copy of the completed report/dissertation/thesis addressed to:

The Director: Research Services
Western Cape Education Department
Private Bag X9114
CAPE TOWN
8000

We wish you success in your research.

Kind regards.
Signed: Audrey T Wyngaard
for: **HEAD: EDUCATION**
DATE: 14 November 2011

Appendix B: Letter of Request to Schools to Conduct Research

July 2011

TO: PRINCIPALS OF SECONDARY SCHOOLS

Dear Sir/Madam

RE: "TEACHER AWARENESS OF DYSLEXIA" QUESTIONNAIRE

I am conducting a study on TEACHER AWARENESS OF DYSLEXIA IN MAINSTREAM HIGH SCHOOLS as part of a Masters in Arts (Psychology) degree at UNISA. The results of this study will determine the levels of teacher awareness and management of dyslexia in mainstream high schools and the resulting information will inform teacher training institutions and schools of the implications of such awareness.

This letter serves as a request to conduct this study in your school. I am requesting permission to deliver questionnaires to your academic staff (teachers). They will have the opportunity to complete the questionnaires in their own time if they choose to participate in the study. Participation is completely voluntary. I will arrange a date and time for collection of questionnaires.

Yours sincerely

Lynette De Long
Cell number: 079 1055 215
Supervisor: Dr C Ochse (UNISA: Psychology)

Appendix C: Questionnaire

Date: March 2012

To: Participants in "Teacher Awareness of Dyslexia" Questionnaire

I am conducting a study on TEACHER AWARENESS OF DYSLEXIA IN MAINSTREAM HIGH SCHOOLS as part of a Masters in Arts (Psychology) degree at UNISA. The results of this study will determine the levels of teacher awareness and management of dyslexia in mainstream high schools. The resulting information will inform schools as well as teacher training institutions of the implications of such awareness. The questionnaire should only take about 15 minutes to complete. I would greatly appreciate your response to the enclosed questionnaire. The information you provide will be kept strictly confidential and anonymity will be ensured.

Please respond to the statements below as truthfully as possible.

Your participation is voluntary and is greatly appreciated.

Yours sincerely

Lynette De Long

lthompson@bhs.org.za

Please <u>circle</u> the number in the appropriate box. Select only one option unless otherwise indicated.

SECTION A: DEMOGRAPHIC INFORMATION

1. Gender:

Male	Female
1	2

2. Age group:

21-30 years	31-40 years	41-50 years	51-60 years	60+ years
1	2	3	4	5

3. What is your home language?

English	Afrikaans	Xhosa	Zulu	Sotho	Ndebele	Setswana	Siswati	Tsonga	Venda	Other (specify)
1	2	3	4	5	6	7	8	9	10	88

4. What is the language in which you mainly teach?

English	Afrikaans	Xhosa	Zulu	Sotho	Ndebele	Setswana	Siswati	Tsonga	Venda	Other (specify)
1	2	3	4	5	6	7	8	9	10	88

5. What is the highest level of education you have achieved?

3 year Teaching qualification	4 year Teaching qualification	Bachelors plus PGCE or equivalent	Honours or equivalent	Masters	Doctorate	Other (specify)
1	2	3	4	5	6	8

6. Field/s of study at tertiary level:

7. I received my (initial) teaching qualification in:

Before 1970	1971 – 1975	1976 - 1980	1981 – 1985	1986 – 1990	1991 – 1995	1996 – 2000	2001 – 2005	2006 - 2010	2011
1	2	3	4	5	6	7	8	9	10

8. I received my teaching qualification at:

Teacher training college	UWC	UCT	University of Stellenbosch	UNISA	Other (please specify)
1	2	3	4	5	8

9. What is the main subject you teach? (Write only one):

10. Professional rank:

Teacher	HOD	Deputy Principal	Principal	Other (please specify)
1	2	3	4	8

11. Number of years in the teaching profession:

Less than 1	1-5	6-10	11-15	16-20	21 – 25	26- 30	More than 30
1	2	3	4	5	6	7	8

12. Number of years at current place of employment:

Less than 1	1-5	6-10	11-15	16-20	21 – 25	26- 30	More than 30
1	2	3	4	5	6	7	8

13. How many pupils do you teach in total?

Less than 50	51 - 100	101 - 200	201 - 300	301 - 400	More than 400
1	2	3	4	5	6

14. What is the average number of pupils you teach per class?

Less than 15	16 – 20	21 - 30	31 - 40	41 – 50	51 – 60	More than 60
1	2	3	4	5	6	7

15. Educational district of current school:

Cape Winelands	Eden and Central Karoo	Metro Central	Metro East	Metro South	Metro North	Overberg	Westcoast
1	2	3	4	5	6	7	8

SECTION B: LEVEL OF KNOWLEDGE OF DYSLEXIA

Please indicate using a cross [x] whether the following statements are **True or False.** If you are not sure, please indicate so.

No	Statement	True [1]	False [2]	Unsure [3]
16	Dyslexia is a language-based learning disability.			
17	Students with dyslexia usually experience difficulties with spelling.			
18	Students with dyslexia usually experience difficulties with writing.			
19	Students with dyslexia usually experience difficulties with pronunciation of words.			
20	Dyslexia affects individuals throughout their lives.			
21	The exact causes of dyslexia are clear.			
22	About 10% of the school population suffers with dyslexia.			

No	Statement	True [1]	False [2]	Unsure [3]
23	Boys are more prone to be sufferers than girls.			
24	Dyslexics may find it difficult to express themselves orally.			
25	Dyslexics may find it difficult to fully comprehend what others mean when they speak.			
26	People who are very intelligent can be dyslexic.			
27	Dyslexia runs in families; dyslexic parents are likely to have children who are dyslexic.			
28	Dyslexia can affect a person's self-image.			
29	Students with dyslexia often end up feeling "dumb" and less capable than they actually are.			
30	A diagnosis of dyslexia can only be provided by a trained specialist.			
31	Dyslexics read backwards.			
32	Students have trouble remembering letter symbols for sounds and forming memories for words.			
33	Formal testing of reading, language, and writing skills is the only way to confirm a diagnosis of suspected dyslexia			
34	Dyslexic pupils can benefit from receiving extra time in tests or exams.			
35	Dyslexia can be linked to other learning difficulties, such as ADD or ADHD.			
36	Many dyslexics are extremely talented in the arts.			
37	Dyslexia can impact negatively on the individual's future job prospects.			
38	Dyslexia does not actually exist; it's just an excuse for laziness.			

Please evaluate the statements below using the following codes:

- **SD – Strongly Disagree**
- **D – Disagree**
- **U – Unsure**
- **A – Agree**
- **SA – Strongly Agree**

SECTION C: PERCEPTION OF IDENTIFICATION OF DYSLEXIC PUPILS IN THE CLASSROOM

No	Statement	SD	D	U	A	SA
39	I am able to identify the symptoms/characteristics of dyslexia.	1	2	3	4	5
40	I am able to identify the characteristics of a dyslexic pupil as opposed to that of a slow learner.	1	2	3	4	5
41	I am able to identify a learner who is in need of a diagnostic assessment with regards to dyslexia.	1	2	3	4	5

SECTION D: PERCEPTION OF MANAGEMENT OF DYSLEXIC PUPILS IN THE CLASSROOM

42. Are you aware of any dyslexic pupils in your class?

Yes	No
1	2

Answer the questions below ONLY if you indicated "yes" to questions 42.

No	Statement	SD	D	U	A	SA
METHODOLOGY						
43	I believe that I limit the number of instructions given at one time.	1	2	3	4	5
44	I allow dyslexic students to sit close to the instructional focal point in my classroom.	1	2	3	4	5
45	In my opinion, I try to repeat a sequence of instructions at appropriate points during practical activities.	1	2	3	4	5
MEASURING PROGRESS						
46	I believe that I add positive comments to assessed work.	1	2	3	4	5
47	I believe that I focus on the dyslexic's individual progress without comparing them to the rest of the class.	1	2	3	4	5
WORKING WITH PARENTS						
48	In my opinion, I use the homework diary as a tool for communicating with parents.	1	2	3	4	5
49	I believe that I keep parents informed of their child's progress.	1	2	3	4	5

CLASSROOM BEHAVIOUR						
50	I am aware that dyslexics may have an inability to remember spoken instructions and this can lead to inattentiveness or apparent laziness.	1	2	3	4	5
51	I am aware that dyslexics may have an inability to process written directions.	1	2	3	4	5
52	I believe that group work is detrimental to the dyslexic pupil's progress on a set class activity.	1	2	3	4	5
53	I check that my instructions are clear and fully understood by asking pupils to repeat them.	1	2	3	4	5
54	I believe that I vary activities so that pupils become less fatigued.	1	2	3	4	5
DIFFERENT LEARNING STYLES						
55	In my opinion, I use a variety of different teaching methods.	1	2	3	4	5
56	I believe pupil discussion in class is counter-productive as it only fosters a noisy classroom environment.	1	2	3	4	5
57	I allow extra time in tests.	1	2	3	4	5
ORGANISATION						
58	I believe I provide copies of class notes so that dyslexic pupils may simply listen to the lesson.	1	2	3	4	5
59	I do not accept homework scribed by parents or other adults.	1	2	3	4	5
60	I accept homework that is computer-aided.	1	2	3	4	5
COMBATING THE EFFECTS OF FATIGUE						
61	I am aware that a huge effort is required by many dyslexic pupils to complete an ordinary task.	1	2	3	4	5
62	I believe that I set short, well-defined tasks.	1	2	3	4	5
63	I think that I vary the types of tasks set.	1	2	3	4	5
64	I believe that I set time limits for the duration of tasks.	1	2	3	4	5
65	I understand the importance of creating an opportunity for purposeful movement within the classroom.	1	2	3	4	5
66	I believe that I give out homework well before the end of the lesson.	1	2	3	4	5
67	I ensure that homework is written down correctly.	1	2	3	4	5

RAISING PUPILS' SELF-ESTEEM						
68	I believe that I praise effort as well as work well done.	1	2	3	4	5
69	I insist that dyslexics read aloud in class.	1	2	3	4	5

SECTION E: PRE-SERVICE TRAINING IN DYSLEXIA PROVIDED BY INSTITUTIONS

70. Have you had pre-service training (training provided by your training institution) in the field of dyslexia?

Yes	**No**
1	2

Answer this question ONLY if you indicated "yes" to question 70.

No	**Statement**	**SD**	**D**	**U**	**A**	**SA**
71	I believe that the pre-service training I received in the field of dyslexia was detailed and sufficiently in depth	1	2	3	4	5
72	I believe that the pre-service training I received in the field of dyslexia made me confident in my ability to identify dyslexic indicators	1	2	3	4	5
73	I am confident that the pre-service training I received in the field of dyslexia gave me adequate tools and/or strategies to manage dyslexia in my classroom	1	2	3	4	5

SECTION F: IN-SERVICE TRAINING PROVIDED BY SCHOOL

74. Have you had in-service training (training provided by your current/previous school) in the field of dyslexia?

Yes	**No**
1	2

Answer this question ONLY if you indicated "yes" to question 74.

No	**Statement**	**SD**	**D**	**U**	**A**	**SA**
75	I think that the in-service training I received/receive in the field of dyslexia was/is detailed and sufficiently in depth	1	2	3	4	5
76	The in-service training I received/receive in the field of dyslexia made/makes me confident in my ability to identify dyslexic indicators	1	2	3	4	5

77	The in-service training I received/receive in the field of dyslexia gave/gives me adequate tools and/or strategies to manage dyslexia in my classroom	1	2	3	4	5

END OF QUESTIONNAIRE – THANK YOU FOR YOUR TIME AND EFFORT!