

Teachers' Knowledge of Dyslexia in Akmola Region of Kazakhstan

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This letter now confirms that your research project entitled *Teachers' Knowledge of Dyslexia in Akmola Region of Kazakhstan* has been approved by the Graduate School of Education Ethics Committee of Nazarbayev University.

You may proceed with contacting your preferred research site and commencing your participant recruitment strategy.



Yours sincerely,

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TEACHERS' KNOWLEDGE OF DYSLEXIA IN AKMOLA REGION OF KAZAKHSTAN**Abstract**

The International Association of Dyslexia (2020) suggests that 3 to 5% of the entire school population experience difficulties related to dyslexia. In many countries, dyslexia as a learning disability is supposed to be addressed within the inclusive system of education (International Dyslexia Association, 2016). Most researchers state that the success of learners with dyslexia depends on high-quality, evidence-based and informed teaching (Elliot & Grigorenko, 2014; Riddick, 2010; Thomson, 2009). A lack of knowledge by teachers about dyslexia can lead to ineffective teaching and, as a result, to the low academic performance of students with dyslexia (Camilleri, Chetcuti & Falzon, 2019). In recent years, much research has been conducted to explore teachers' knowledge about dyslexia. Unfortunately, the lack of academic research on dyslexia in Kazakhstan makes it impossible to understand what Kazakhstani teachers know about dyslexia and what strategies they use to address this learning disability. The purpose of the present research was to measure teachers' knowledge about dyslexia in mainstream schools of Akmola region in Northern Kazakhstan and to analyze if there is any relationship between teachers' knowledge of dyslexia and their training experiences. The data was collected via an online survey with the use of the Scale of Knowledge and Beliefs about Developmental Dyslexia (Soriano-Ferrer & Echegaray-Bengoa, 2014). Overall, 1435 teachers participated in the survey. The research revealed that teachers in Akmola region of Northern Kazakhstan have limited knowledge about dyslexia across three layers: neurological, cognitive and behavioural. Cross-tabulation analysis showed that there is no relationship between teachers' knowledge of dyslexia and their training experiences. Most teachers who reported that they covered dyslexia within the pre-service and in-service teacher education programmes did not show a good understanding of dyslexia. Z-test of proportions revealed that teachers who are interested in further professional development on dyslexia do not have better knowledge about dyslexia than those teachers who are not interested in additional training on dyslexia. These findings highlight a high need for quality training on dyslexia for

teachers in Akmola region of Kazakhstan. The principal recommendation of this research is to further explore teachers' knowledge about dyslexia in Kazakhstan to understand better what teachers in other regions of Kazakhstan know about dyslexia and to what extent teachers' knowledge and understanding of dyslexia influence their teaching practices.

Keywords: inclusive education, dyslexia, teachers' knowledge, training experiences.

АҚМОЛА ОБЛЫСЫ МҰҒАЛІМДЕРІНІҢ «ДИСЛЕКСИЯ» ТУРАЛЫ БІЛІМІ**Аңдатпа**

Халықаралық дислексия қауымдастығы (2020) бүкіл мектеп мүшелерінің 3-5% -ы дислексиямен байланысты қиындықтарға тап болады деп болжайды. Көптеген елдерде дислексия оқу кемістігі ретінде инклюзивті білім беру жүйесінде шешілуі керек деп бағамдалады (International Dyslexia Association, 2016). Зерттеушілердің көпшілігі дислексиясы бар оқушылардың жетістіктері сапалы, дәлелді және ақпараттандырылған оқытуға байланысты екенін мәлімдейді (Elliot & Grigorenko, 2014; Riddick, 2010; Thomson, 2009). Мұғалімдердің дислексия туралы білімінің жеткіліксіздігі оқытудың тиімсіздігіне, және нәтижесінде дислексиясы бар оқушылардың төмен үлгеріміне әкелуі мүмкін (Camilleri, Chetcuti & Falzon, 2019). Соңғы жылдары, мұғалімдердің дислексия туралы білімін зерттеу үшін көптеген зерттеу жұмыстары жүргізілуде. Өкінішке орай, Қазақстанда дислексия туралы академиялық зерттеулердің болмауы қазақстандық мұғалімдердің дислексия туралы білімін және осы оқу кемістігін жою үшін қолданылатын стратегияларды түсінуге мүмкіндік бермейді. Осы зерттеу жұмысының мақсаты - Солтүстік Қазақстан өңіріндегі Ақмола облысының жалпы білім беретін мектеп мұғалімдерінің дислексия туралы білімін зерттеу, және мұғалімдердің дислексия туралы білімі мен олардың оқыту тәжірибесі арасында қандайда бір байланыс бар-жоғын талдау болып табылады (Camilleri, Chetcuti & Falzon, 2019). Мәліметтер Даму Дислексиясы туралы Білім мен Сенім шкаласын қолдана отырып онлайн-сауалнама арқылы жиналды (Sorigano-Ferrer & Echegaray-Bengoia, 2014). Жалпы, сауалнамаға 1435 мұғалім қатысты. Зерттеу барысында Солтүстік Қазақстан өңірі Ақмола облысы мұғалімдерінің дислексия туралы үш деңгейлі, яғни неврологиялық, когнитивтік және мінез-құлықтық білімі шектеулі екендігі анықталды. Кестелік талдау мұғалімдердің дислексия туралы білімі мен олардың педагогикалық тәжірибесінің арасында ешқандай байланыс жоқ екенін көрсетті. Бастапқы және қызмет барысындағы мұғалімдердің біліктілігін арттыру бағдарламалары арқылы дислексия туралы мағлұмат қабылдағанын баяндаған мұғалімдердің

көпшілігі дислексияны жақсы түсінетіндіктерін көрсете алмады. Пропорционалдық Z-тесті көрсеткендей, дислексия бойынша одан әрі кәсіби дамуға мүдделі мұғалімдер дислексия туралы қосымша білім алуға қызығушылық танытпайтын мұғалімдерге қарағанда дислексия туралы жақсы білімге ие емес. Бұл тұжырымдар Ақмола облысы мұғалімдеріне дислексия бойынша сапалы білім берудің жоғары қажеттілігін көрсетеді. Бұл зерттеудің негізгі ұсынысы - Қазақстанның басқа аймақтарындағы мұғалімдердің дислексия туралы не білетіндігін және мұғалімдердің дислексия туралы білімі мен түсініктері олардың оқыту тәжірибелеріне қаншалықты әсер ететіндігін түсіну үшін Қазақстандағы мұғалімдердің дислексия туралы білімін одан әрі зерттеу болып табылады.

Кілт сөздер: инклюзивті білім беру, дислексия, мұғалімдердің білімі, оқыту тәжірибелері.

ИССЛЕДОВАНИЕ УРОВНЯ ЗНАНИЙ УЧИТЕЛЕЙ ПО ТЕМЕ «ДИСЛЕКСИЯ» В ОБЩЕОБРАЗОВАТЕЛЬНЫХ ШКОЛАХ АКМОЛИНСКОЙ ОБЛАСТИ

Абстракт

По данным международной ассоциацией дислексии, от 3 до 5% учащихся школьного возраста сталкиваются с трудностями в обучении, связанные с дислексией (Международная Ассоциация Дислексии, 2016). Во многих странах дислексия как нарушение способности к обучению широко изучается в рамках научных исследований и обсуждается на уровне учительского сообщества. Большинство исследователей утверждают, что применение специальных методик и индивидуального подхода в обучении детей страдающих дислексией оказывает успешное влияние на развитие их грамотности (Elliot & Grigorenko, 2014; Riddick, 2010; Thomson, 2009). При этом, недостаточная или ошибочная информация о дислексии может привести к неэффективному обучению и, как следствие, к низкой успеваемости учащихся с дислексией (Camilleri, Chetcuti & Falzon, 2019). В последние годы было проведено много международных исследований, направленных на изучение уровня знаний учителей о данном состоянии. К сожалению, тема дислексии практически не изучена в Казахстане. Отсутствие информации и научных исследований по дислексии в Казахстане делает невозможным понимание того, что казахстанские учителя знают о дислексии и какие стратегии они используют для обучения учащихся с дислексией. Целью данного исследования является изучение уровня знаний учителей общеобразовательных школ Акмолинской области о дислексии. Данные по исследованию были собраны с помощью онлайн-опроса с использованием шкалы KBDDS (Soriano-Ferrer & Echegaray-Bengoa, 2014). Всего в опросе приняли участие 1435 учителей общеобразовательных школ. Исследование показало, что учителя Акмолинской области Северного Казахстана имеют ограниченные знания о дислексии. Большинство учителей, сообщивших о том, что они изучали дислексию в рамках программ подготовки учителей в педагогических ВУЗах и на курсах повышения квалификации, не показали глубоких знаний о теме. Эти выводы подчеркивают высокую

потребность в более качественной подготовке учителей Акмолинской области и возможно других регионов Казахстана для работы с учащимися с дислексией. Основная рекомендация данного исследования заключается в дальнейшем изучении знаний учителей о дислексии в Казахстане, с целью лучшего понимания того, что знают учителя в других регионах Казахстана о дислексии и в какой степени знания и понимание учителей о дислексии влияют на их педагогическую практику.

Ключевые слова: инклюзивное образование, дислексия, педагогические знания, опыт обучения.

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Chapter 1: Introduction

1.1. Introduction

In 2015, Kazakhstan ratified the Convention on the Rights of Persons with Disabilities, demonstrating a strong commitment and full support to the concept of inclusive education and the global movement Education for All (UNICEF, 2015). Since then, several educational programmes have been introduced in Kazakhstan to ensure that children with special educational needs receive quality education in mainstream schools without being segregated from their peers (Ministry of Education and Science [MoES], 2010). Though the government has developed legislative policies to create an inclusive education system, much uncertainty still exists around the implementation of services for students with learning disabilities such as dyslexia in the country.

In many countries, dyslexia as a learning disability is recognized by law and is supposed to be addressed within the inclusive system of education, together with many other special educational needs (International Dyslexia Association, 2016). Nevertheless, numerous international researchers point out that now it is rather difficult to estimate the prevalence of dyslexia across the world as the assessment of dyslexia depends on its definition, which varies in different countries (Elliot & Grigorenko, 2014; Riddick, 2010; Wadlington & Wadlington, 2005). The major problem is that different definitions of dyslexia applied across various countries lead to differences in how this phenomenon is measured or accounted for, and thus, its statistics might not be comparable across national contexts. For example, British researchers say that 10% of the UK population has dyslexia (UK Government, 2017), while American scientists estimate that from 17% to 20% of the American population has some symptoms of this learning disability (Wadlington & Wadlington, 2005). Though this discrepancy in the proportion of dyslexic students across different countries shows that some definitional issues exist in the field, educational researchers from different countries agree that these figures demonstrate a high degree of possibility for mainstream school teachers to meet children with dyslexia in their classrooms (Elliot & Grigorenko, 2014; Riddick, 2010; Rose, 2009; Thomson, 2008; Wadlington & Wadlington, 2005).

Nevertheless, previous studies have reported that teachers have just a basic understanding of dyslexia and feel unprepared to help students with dyslexia in the classroom (Wadlington & Wadlington, 2005; Chourmouziadou, 2016; Gonzalez & Brown, 2019). Rose (2009) argues that the consequences of low teacher awareness concerning dyslexia could be critical for dyslexic learners. Numerous educational researchers support this view and claim that children with dyslexia, who do not receive proper assistance and support at school, probably will not be able to reach their true potential and contribute to the prosperity and the development of the whole society (Elliot & Grigorenko, 2014; Livingston, Siegel & Ribary, 2018; Riddick, 2010; Rose, 2009; Thomson, 2008). For this reason, this study aims to explore recent research into dyslexia within existing theoretical frameworks and to examine the level of teachers' knowledge of dyslexia in mainstream schools in Akmola region of Kazakhstan.

Akmola region was chosen for the current research as it is one of the largest regions in the North of Kazakhstan, with a population of nearly 740 000 people (Information and Analytical Center [IAC], 2020). Inclusive education is a relatively new educational approach for Kazakhstan. The first inclusive classrooms appeared in Akmola region in 2012, and in 2016 'Inclusive Education' was introduced as a compulsory course in pre-service education training programmes in the republic and regional higher educational institutions (Shayakhmetova, 2018). Therefore, the research conducted in Akmola region might provide significant insights into the researched topic, which will be applicable across Kazakhstan.

1.2. Definitions of Terms

This study attempts to measure the level of teachers' knowledge of dyslexia and establish to what extent teachers' understanding of dyslexia depends on their training experiences. This study will use the definition of dyslexia suggested by the International Dyslexia Association (2002). Although differences of opinion on dyslexia still exist, there appears to be some agreement among most researchers who support the definition offered by the International Dyslexia Association (2002), which defines dyslexia as a neurological learning disability characterized by several

symptoms connected with language-based problems, namely difficulties in reading, writing, spelling, and pronunciation (International Dyslexia Association [IDA], 2002).

'Learning disability' is another key term that will be used in the current study. The American Psychiatric Association (2018) defines a learning disability as a condition when children have difficulties in more than one area of learning which are not connected to their overall intelligence or lack of motivation. It is worth mentioning that though the terms 'learning disability' and 'learning disorder' are not precisely synonymous according to the American Psychiatric Association (2018), they are usually used interchangeably in the international literature and this study.

Another essential term of the current study is teachers' 'pedagogical knowledge'. With reference to previous research, Voss, Kunter and Baumert (2011) offer that general pedagogical knowledge encompasses the following key elements: knowledge of classroom management, teaching methods, classroom assessment, learning processes and the individual characteristics of students. Based on this concept, this study aims to explore what teachers know about the nature of dyslexia and if teachers are aware of the teaching and assessment methods needed to work with students who have dyslexia.

It is necessary here to also clarify exactly what is meant by the term 'training experiences'. This paper will use the definition suggested by Knight (2018), which refers to the professional development of teachers and encompasses pre-service teacher education and in-service teacher training programmes.

1.3. Statement of the Research Problem

The proportion of countries that have recognized dyslexia as a learning disability is increasing every year (International Dyslexia Association, 2016). Unfortunately, Kazakhstan still does not have a clear policy in this field. For example, such Kazakhstani authors as Tlemissov, Saparova, Abilmazhinov, Karimova and Tlemissova (2020) sincerely believe that "...education systems that acknowledge the existence of dyslexia are a failure in the society..." (p. 9). They argue

that those education systems which have recognized dyslexia as a learning disability "...failed to meet the needs of their learners" (Tlemissov et al., 2020, p. 9). Still, most countries, whose systems of education are the most effective education systems in the world, have recognized dyslexia as a learning disability and have special systems of accommodation and remediation of dyslexia in their countries. For example, countries such as Singapore, Finland and Estonia, whose students remain the highest achieving students according to the International Education Ranking System (OECD, 2018), have special programmes to address dyslexia as a learning disability (Dyslexia Association of Singapore, 2020; Sillak, Varik-Maasik & Lukanenok, 2014; Uusiautti & Äärelä, 2015). Unlike Tlemissov et al. (2020), other educators in Kazakhstan such as Davletiyarova, Onlasynova (2016) and Dushebayeva (2017) agree that dyslexia is a widespread learning disability among students in Kazakhstan and emphasize that students with dyslexia require a special educational approach that will help them to develop their learning strategies and become successful learners. However, the problem is that literature on dyslexia in Kazakhstan is mostly connected with special education and does not provide mainstream school teachers with information on how to teach students with dyslexia and support their development. Moreover, as dyslexia is not recognized as a learning disability in Kazakhstan, there is no common practice to identify dyslexia among children at regular schools and, consequently, address this problem in the classroom.

According to the International Association of Dyslexia (2020), from 3 to 5% of the school population across the world are affected by dyslexia. Educational researchers believe that these figures show that mainstream school teachers will meet students with dyslexia in their classrooms (Chourmouziadou, 2016; Rose, 2009; Wadlington & Wadlington, 2005). Moreover, most researchers argue that the success of such students depends on high-quality, evidence-based and informed teaching (Elliot & Grigorenko, 2014; Riddick, 2010; Thomson, 2009). A lack of knowledge by teachers about dyslexia can lead to ineffective teaching and, as a result, to the low academic performance of students with dyslexia (Camilleri, Chetcuti & Falzon, 2019). Given that almost 3 to 5% of the entire school population in the world experience difficulties connected with

dyslexia (IDA, 2020), there is a strong possibility for Kazakhstani teachers to also have students with dyslexia in their classrooms. It shows that it is pivotal for Kazakhstani teachers to be aware of what dyslexia is and know what effective strategies they can use to teach learners with dyslexia.

1.4. Purpose of the Study

The purpose of this study is to measure the level of teachers' knowledge about dyslexia in the mainstream schools of Akmola region and to analyze if there is any relationship between teachers' knowledge of dyslexia and their training experiences.

In order to measure the level of teachers' knowledge about dyslexia in Akmola region, and to analyze how their training experiences influence their knowledge of dyslexia, the following research questions are addressed:

1. What is the level of teachers' knowledge of dyslexia in public schools in Akmola region of Kazakhstan?

2. What is the relationship between teachers' understanding of dyslexia and their pre-service and in-service teacher training experiences?

1.5. Significance of the Study

Far too little attention has been paid to the problem of dyslexia in Kazakhstan. The lack of literature and academic research on dyslexia makes it problematic to understand what Kazakhstani educators know about dyslexia and what strategies they use to address this learning disability at the school level. Also, little is known about the prevalence of dyslexia in Kazakhstan (Korostelyova, 2020). To better understand the situation regarding dyslexia in the country, more research on this topic should be carried out in the country. This study attempts to address this gap in knowledge by focusing on what teachers of mainstream schools in one of the large regions of Northern Kazakhstan know about dyslexia. The answers to such questions as what teachers know about dyslexia in Akmola region and whether there is any relationship between teachers' understanding of dyslexia and their training experiences will provide information that will be equally valuable both for the community of educators and policymakers on the national and local level. Since this study

focuses on what teachers know about dyslexia, the findings of this study will be also helpful for identifying the needs of training for teachers in Akmola region and Kazakhstan. Research on dyslexia will help to raise basic awareness of dyslexia within the community of educators and might help the government to construct some clear policies on dyslexia in the country, which will serve as the foundation for further research and investigation.

Chapter 2: Literature Review

2.1. Introducing the “Problem” of Dyslexia

The concept of dyslexia has caused much debate and heated discussions among educators and scientists across the world. The British politician, Graham Stringer, claimed that dyslexia does not exist and was invented to cover up ineffective teaching at schools (Elliot & Grigorenko, 2014; Summers, 2009). He blamed the British system of education for the low academic attainments and poor literacy of children. He argued that poor literacy of children results from ineffective educational policy and poor teaching (Elliot & Grigorenko, 2014; Summers, 2009). This claim sparked a serious discussion in the international educational community. Many researchers and educators across the world disagreed with his claims and said that they found them frustrating and mistaken (Lipsett, 2009). In line with Graham Stringer (Elliot & Grigorenko, 2014; Summers, 2009), who claimed that dyslexia is a myth, some scholars in Kazakhstan (Tlemissov et al., 2020) argue that a broad definition of dyslexia and the lack of internationally recognized tests to identify dyslexia prove that dyslexia does not exist. It illustrates that the topic of dyslexia is still highly debatable, and that questions connected with the validity of dyslexia as a learning difficulty are still not answered in society.

Though dyslexia was first mentioned and described in academic work at the end of the 19th and the beginning of the 20th centuries, the extensive and insightful research on dyslexia began in the 1970s when some European countries and the United States of America recognized this condition as a learning disability (Thomson, 2009). A considerable amount of research has been carried out since then with the aim to understand and explain what dyslexia is (Breznitz, 2008).

Though there is not a common agreement on the definition of dyslexia, most countries have now adopted the definition which was suggested by the International Dyslexia Association (2002), which says that:

Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized 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 the growth of vocabulary and background knowledge (IDA, 2002).

This definition outlines the main symptoms that people with dyslexia might display and refers to the possible causes that might influence dyslexia. However, some researchers say that most definitions that exist now are too general and must be further elaborated to include specific details (Gyorfi & Smith, 2010). Moreover, they say that the absence of a universally acknowledged international definition of dyslexia brings more discussion to the field and makes its identification ambiguous and problematic. Elliot and Grigorenko (2014) argue that if specialists in different countries have different definitions of dyslexia and, therefore, use different criteria to diagnose dyslexia, then it is difficult to be sure that they identify the same condition. Besides, this disagreement makes it more difficult to analyze the prevalence of dyslexia across countries and draw feasible solutions about how to address this learning disability (Elliot & Grigorenko, 2014). The subsequent sections of this chapter will review existing theories and concepts on dyslexia and analyze the findings from recent studies on teachers' knowledge and awareness of dyslexia.

2.2. Theories of Dyslexia

Different theories suggest evidence-based explanations and possible interpretations of what dyslexia is. There are three main domains within which dyslexia is analyzed: neurological/

biological, cognitive and behavioural (Frith, 1999). The following part of this thesis moves on to describe in greater detail these three domains.

2.2.1. The Neurological Theory

The neurological theory is based on two extensive research areas: research on the brain and research on the genome (Elliot & Grigorenko, 2014). Elliot and Grigorenko (2014) highlight that a significant amount of research conducted in this direction showed that the cause of reading disabilities and reading-related skills might lie in the brain and different brain structures. In line with this explanation, asynchrony theory, which was proposed by Breznitz (2008), suggests that dyslexia could be the result of asynchronous work of different parts of the brain during the process of reading. The explanation given is that the successful activation of the reading process requires the synchronous functioning of different brain entities within a short period of time. The problem is that people with dyslexia, due to biological differences in brain structures, need more time to process this information (Breznitz, 2008). Innovative scientific methods have been used recently to analyze and compare how the information is processed by people with and without dyslexia. Evidence shows that dyslexic readers of all ages process information slower than typical readers because their brains are functioning asynchronously and need more time for the enactment of this activity (Breznitz, 2008). However, Thomson (2009) stresses that the neurological explanation of dyslexia does not imply that children with dyslexia cannot be taught to read and to spell. The understanding of this theory is that a teacher needs to look at this characteristic as an individual difference in a child and employ the appropriate resources and techniques to meet such children's educational needs (Thomson, 2009). In line with this understanding of the theory, Stein (2008) says that the awareness of neurological factors that can influence this condition leads to improved and effective teaching practices for children with dyslexia.

Heredity factors are one more significant neurobiological aspect that can influence dyslexia. Considerable research has been conducted on the role of genetics in dyslexia, and numerous scientists arrived at the conclusion that genes are important in reading and reading disabilities

(Elliot & Grigorenko, 2014; Stein, 2008; Thomas, 2009). The research conducted by Carroll, Mundy and Cunningham (2014) corroborates this theory and suggests that family risk of dyslexia might serve as an additional predictor for the identification of children at risk. They say that in order to prevent negative consequences, it is suggested to provide young learners with a family history of dyslexia with extra support and assistance (Carroll et al., 2014). Elliot and Grigorenko (2014) agree with this view and say that the knowledge of the genetic origin of dyslexia might be helpful in identifying students at risk at an earlier age, which will allow educators to intervene earlier and provide students with dyslexia with special and appropriate assistance. Most researchers believe that teachers' knowledge and understanding of the neurobiological theory, both neurological and genetic factors, might contribute significantly to organizing appropriate assistance and support for learners with dyslexia (Elliot & Grigorenko, 2014; Riddick, 2010; Thomson, 2009). Such support aims to help children with dyslexia to adapt to the difficulties they have in the learning process.

2.2.2. The Cognitive Theory

To have an in-depth understanding of what dyslexia is, the cognitive factors should be considered and analyzed thoroughly. Elliot and Grigorenko (2014) identify the following cognitive processes that could have a considerable influence on dyslexia: phonological processing, auditory and visual impairments, working memory, motor difficulties and poor naming speed. The majority of scientists acknowledge that phonological processing is strongly connected with the ability to read (Riddick, 2010). Several components of phonological processing are recognized by researchers, such as phonological awareness, phonological memory, phonological recoding and lexical retrieval, but it is believed that the most powerful cognitive factor which influences dyslexia is phonological awareness (Elliot & Grigorenko, 2014; Riddick, 2010; Thomson, 2009).

Phonological awareness is defined as the ability to identify and control the sounds of an oral language (Gibbons, 2015; Thomas, 2009). According to the phonological theory, learners with dyslexia do not hear speech sounds as regular learners and this might lead to problems with phonological and orthographic awareness (Elliot & Grigorenko, 2014). Evidence shows that

dyslexic children have difficulties decoding single words which in turn results in poor reading and spelling skills (Riddick, 2010). It is obvious that phonological awareness is crucial for developing reading skills, but educational researchers highlight that it should be understood that phonological difficulties and reading disabilities are interrelated with each other (Elliot & Grigorenko, 2014; Riddick, 2010). Evidence shows that it is problematic to split causes from consequences; poor phonological awareness does not necessarily lead to reading disabilities, and the development of reading skills might have a positive impact on the improvement of phonemic awareness (Castles & Coulthart, 2004; Elliot & Grigorenko, 2014; Thomson, 2009). Elliot and Grigorenko (2014) say that phonological awareness might be considered as the most influential cognitive aspect, but the fact that not all students who experience difficulties in reading have a phonological deficit, and not all students who have phonological problems demonstrate difficulties in reading should also be taken into account. Moreover, as Thomson (2009) says, the environmental component plays a significant role here too because if a child has not been taught to connect sounds with letters, then he will not be able to identify this correspondence. In line with Elliot and Grigorenko (2014) and Thomson (2009), Manis and Bailey (2008) arrived at a similar conclusion after an analysis of their research results. They stress that neurological differences might be the cause of a phonological deficit. Still, this correlation does not mean that these difficulties cannot be addressed and that there is nothing that can be done to help a child with dyslexia (Manis & Bailey, 2008).

Elliot and Grigorenko (2014) argue that in research about the causes which might influence dyslexia, stress should also be placed on visual and auditory impairments. Some scientists disagree that visual impairments play a key role in dyslexia. Still, they do not deny the fact that some learners with dyslexia do report visual difficulties which they experience while reading (Riddick, 2010). Thus, teachers and educators should also consider the possibility that dyslexic children might experience difficulties related to processing auditory and visual inputs. Therefore, as already mentioned, research on the underlying causes of dyslexia has crucial implications for teachers and

educators. Riddick (2010) highlights that the most practical value of the phonological theory is that it has much evidence-based knowledge to inform teaching and intervention in schools.

2.2.3. The Behavioural Theory

Within the behavioural theory, researchers analyze symptoms or other clear characteristics that can help them to diagnose dyslexia in a person or identify people at risk of having this learning disability. For example, poor reading, poor motor development, poor speed naming, and poor phoneme awareness might result from dyslexia. However, they could be caused by other condition or learning disabilities (Elliot & Grigorenko, 2014). It means that teachers need to be able to recognize the real causes that lie behind the difficulties a child might experience within learning.

For the assessment procedures, in most countries where dyslexia is recognized as a learning disability, school educators and psychologists use a standardized assessment tool to measure a sample of behaviours and make conclusions for each individual case according to the obtained data (Thomson, 2009). The most important role of this assessment for teachers is to evaluate a student's cognitive and other abilities in order to provide a child with better teaching and appropriate support (Thomson, 2009). Most researchers agree that a holistic approach and the integration of neurological, cognitive and behavioural analysis will help to find better ways to address dyslexia and help dyslexic people to reach their true potential (Elliot & Grigorenko, 2014; Riddick, 2010; Thomson, 2009).

Though some disagreement in understanding and defining dyslexia exists among scientists and educators, most researchers agree that dyslexia is a spectrum with a display of different symptoms and severity (The National Institute of Neurological Disorders and Stroke [NINDS], 2019; Riddick, 2010). More and more researchers recognize dyslexia not as a deficit, but as a difference in the neurological and cognitive levels which requires appropriate educational intervention in teaching (The Learning and Skills Development Agency and NIACE, 2004). It is generally acknowledged that dyslexia is a condition that might be caused by biological and cognitive differences and is not the result of poor instruction or low intelligence (IDA, 2002). Most

researchers stress that an analysis of the causes of dyslexia and research on dyslexia can provide teachers with evidence-based information which can help them to build an appropriate system of interventions to meet the needs of learners with dyslexia (Elliot & Grigorenko, 2014; Gyorfi & Smith, 2010; Riddick, 2010). Given that research results and theories, within which dyslexia is analyzed, have important implications for teachers, it seems fair to suggest that teachers' knowledge of dyslexia is indispensable for the identification process of students with dyslexia.

2.3. Identification of Dyslexia

The identification process of children with dyslexia heavily depends on teachers' awareness of dyslexia and their pedagogical expertise (Rose, 2009). Rose (2009) points out that identifying and helping children with dyslexia to adapt to the difficulties they experience in learning demands much knowledge and professionalism from teachers. Teachers' expertise in this sphere makes it possible to recognize children at risk and to identify those children who possess this learning disability. Most researchers argue that the identification at an earlier stage and timely intervention might enable dyslexic children to cope with literacy difficulties which they might have in learning due to their condition (Elliot & Grigorenko, 2014; Livingston, Siegel & Ribary, 2018; Riddick, 2010; Rose, 2009; Thomson, 2008). Livingston et al. (2019) state that students with dyslexia who do not receive appropriate teaching and assistance at school might experience stress and anxiety, which could harm their emotional well-being. Thomson (2009) argues that the identification of dyslexia and the support of children with dyslexia might prevent some of them from antisocial and even criminal behaviour in the future. He points out that a large proportion of the prison population is illiterate and have problems connected with dyslexia (Thomson, 2009). It shows that teachers' knowledge and their role are crucial, both in the teaching and identification processes, as it helps to provide children with dyslexia with necessary support and a quality education.

A considerable amount of research evidence shows that the early identification of dyslexia and high-quality teaching positively influence the literacy of children with dyslexia (Rose, 2009; Wadlington & Wadlington, 2005). Through a combination of expert knowledge, it is fair to suggest

that much emphasis now lies on effective pedagogical strategies geared at helping students with dyslexia and are highly dependent on teachers' knowledge and awareness of this learning difficulty.

2.4. Teachers' Knowledge of Dyslexia

In recent years, a significant amount of literature on dyslexia and education has been published. Numerous studies have concentrated on analyzing teachers' knowledge of dyslexia and on the analysis of factors that might influence teachers' awareness of dyslexia. This section will review the recent studies which have explored teachers' knowledge of dyslexia and the factors which might influence their knowledge.

2.4.1. Teachers' Knowledge of Neurological Nature of Dyslexia

Most educational scientists stress that an accurate and deep understanding of the neurological and cognitive nature of dyslexia equips teachers with the knowledge and evidence-based information on how to best help students with dyslexia (Elliot & Grigorenko, 2014; Gyorfi & Smith, 2010; Riddick, 2010). Elliot and Grigorenko (2014), Gyorfi and Smith (2010) and Riddick (2010) argue that the understanding of the neurological and cognitive nature of dyslexia helps teachers to understand the real causes of this learning disability and build their teaching practice according to the needs of students with dyslexia.

Research shows a varying degree of teachers' awareness of the neurological and cognitive causes of dyslexia. The fact that neurological and genetic factors cause dyslexia in some contexts is known better than in others. A study, which was conducted by Bell, McPhillips and Doveston (2011) in England and Ireland, revealed that only a minority of teachers (7 out of 72 in Ireland and 3 out of 57 in England) could refer to the neurological factors of dyslexia. The researchers concluded that the respondents in both countries were better aware of the behavioural characteristics of dyslexia than of the neurological and cognitive ones (Bell et al., 2011). Research conducted by Knight (2016) in England and Wales arrived at similar results and demonstrated that only 9% and 39.3 % of respondents knew that dyslexia is caused by neurological and cognitive differences, respectively. A recent study from China corroborates these findings and reports that

80% of surveyed teachers were not aware of the neurological origin of dyslexia, and almost 60% of respondents believed that dyslexia is caused by “poor literacy environment” (Yin, Joshi & Yan, 2019, p.11). These results illustrate that teachers have a vague understanding of the neurological nature of dyslexia (Bell et al., 2011; Knight, 2016; Yin et al., 2019). Bell et al. (2011), Knight (2016) and Yin et al. (2019), in the context of their countries, suggested that further professional development for teachers is highly needed in this sphere.

Also, considerable research has been conducted on the role of genetics in dyslexia in different countries. Though many researchers highlight the importance of genetics as one of the predominant risk factors for dyslexia, recent research results have shown that a significant proportion of teachers do not know about that. A study of teachers in the United States of America by Wadlington and Wadlington (2005) revealed that 51.2 % of surveyed educators wrongly believed that dyslexia is not hereditary. Research conducted in Greece in 2016 demonstrated similar results and showed that almost 45.6 % of respondents were not aware of the hereditary nature of dyslexia (Chourmouziadou, 2016). Yin et al. (2019) obtained similar results in China. The research showed that 54 % of surveyed teachers in China do not know that dyslexia can run in families (Yin et al., 2019).

These results demonstrate that the neurological basis of dyslexia is poorly understood by teachers, and a large proportion of respondents in different countries do not consider the neurological and genetic factors as risk factors which might cause dyslexia. The majority of educational researchers highlight that an accurate understanding of the neurological nature of dyslexia plays a crucial role in teaching children with this learning disability and it can have a great impact on the effectiveness of classroom practices for students with dyslexia (Bell, et al., 2011; Chourmouziadou, 2016; Knight, 2016; Soriano-Ferrer et al., 2016; Wadlington &Wadlington, 2005; Yin et al., 2019).

2.4.2. Teachers' Knowledge of Cognitive Characteristics of Dyslexia

Several studies have revealed that though teachers have a better understanding of the cognitive nature of dyslexia than of the neurological one, evidence still shows that most teachers have just a basic understanding of the cognitive factors of dyslexia (Barbiero et al., 2019; Chourmouziadou, 2016; Gonzalez & Brown, 2019; Wadlington & Wadlington, 2005). Bell et al. (2011) found that only 23 respondents out of 72 in their survey could refer to the cognitive factors of dyslexia (Bell et al., 2011). Research, conducted in Greece (Chourmouziadou, 2016), showed that 25% of respondents did not know that children with dyslexia have working memory problems, and only 44 % of surveyed teachers knew that a phonological deficit might influence dyslexia in people. Knight (2018) revealed that only 39.3% of surveyed teachers in England and Wales were aware of the cognitive causes of dyslexia, and almost 16.8% of the survey respondents believed that dyslexia and visual factors are interrelated, even though this relationship has not been proven. Yin et al. (2019) also came to a similar conclusion in the context of their country; they indicated that surveyed teachers in China “were ill-informed about the biological and cognitive aspects of dyslexia” (Yin et al., 2019, p.14).

Though numerous scientists and researchers state that teachers' knowledge of the cognitive and neurological nature of dyslexia encourage teachers to change their practices and create appropriate teaching and learning environments for students with dyslexia, evidence shows that a significant number of teachers are vaguely aware of the cognitive and neurological nature of dyslexia (Bell et al., 2011; Chourmouziadou, 2016; Gonzalez & Brown, 2019; Knight, 2018; Soriano-Ferrer et al., 2016; Wadlington & Wadlington, 2005; Yin et al., 2019). Therefore, based on the available evidence from international research, the first hypothesis for this paper was formulated as follows:

Hypothesis 1: Teachers' understanding of the neurological and cognitive nature of dyslexia is low.

2.4.3. Teachers' Knowledge of Behavioral Aspects of Dyslexia

Elliot and Grigorenko (2014) highlight that the knowledge of the neurological and cognitive characteristics, together with the knowledge of the behavioural aspects of dyslexia, ensures that teachers will be able to identify dyslexia and help dyslexic children with timely and appropriate intervention programmes. The results from recent research have demonstrated that teachers are better aware of the behavioural symptoms of dyslexia than of the neurological and cognitive ones (Bell et al., 2011; Chourmouziadou, 2016; Gonzalez & Brown, 2019; Knight, 2018; Soriano-Ferrer et al., 2016; Wadlington & Wadlington, 2005; Yin et al., 2019). Knight (2018) reported that a significant number of respondents (79.5%) of her study in England and Wales (N = 2,600) could identify the behavioural descriptors of dyslexia. Similar results were obtained in the United States of America (Wadlington & Wadlington, 2005), Greece (Chourmouziadou, 2016) and China (Yin et al., 2019), where it was found that 93.6%, 92 % and 70% of the surveyed teachers respectively knew that dyslexia is a learning disability which affects language processing, writing and/or speaking abilities. However, it is worth mentioning that almost 70 % of surveyed teachers in the American study thought that word reversal is the main criterion in the identification of dyslexia and 56 % of respondents did not know that dyslexia is a continuum that could be different in each case and can display different symptoms and levels of severity (Wadlington & Wadlington, 2005). These results are in line with the results discovered by Soriano-Ferrer et al. (2016) in Spain, who found that 63% of surveyed teachers believed that reversing letters and words is the main symptom of dyslexia. Similarly, research in China uncovered that almost 70 % of surveyed teachers thought that seeing letters backwards is the main sign of dyslexia (Yin et al., 2019). These results corroborate the results from the Greek study, where 93 % of surveyed teachers wrongly believed that reversing letters and words is the main characteristic of dyslexia (Chourmouziadou, 2016). However, the vast majority of researchers arrived at the same conclusion in the context of their countries (Bell et al., 2011; Chourmouziadou, 2016; Gonzalez & Brown, 2019; Knight, 2018; Soriano-Ferrer et al., 2016; Wadlington & Wadlington, 2005; Yin et al., 2019). They concluded that though some gaps in

teachers' knowledge concerning the behavioural symptoms exist, teachers still know the behavioural characteristics of dyslexia better than the neurobiological and cognitive aspects. Thus, based on the results received from international studies, the second hypothesis for the current study was formulated as follows:

Hypothesis 2: Teachers know the behavioural characteristics of dyslexia better than the neurological and cognitive ones.

2.4.4. General Knowledge of Dyslexia

One of the most significant findings is that evidence from recent research has demonstrated that most teachers in different countries know that dyslexia is not a myth and really exists (Chourmouziadou, 2016; Wadlington & Wadlington, 2005; Yin et al., 2019). Recent research in China indicated that most surveyed teachers knew that dyslexia is not a myth and really exists (Yin et al., 2019). Likewise, the researchers in Spain and Peru found that 85 % of participants agreed that dyslexia really exists and is not a myth (Soriano-Ferrer et al., 2016). It was also revealed that a considerable number of teachers know that dyslexia is not connected with intelligence. Evidence shows that 53.9 % of the respondents in Greece (Chourmouziadou, 2016) knew that learning difficulties, which students with dyslexia experience, are not connected with low intelligence, and 96 % of the surveyed teachers in America (Wadlington & Wadlington, 2005) knew that people with dyslexia do not have below- average intelligence. Regarding the duration of dyslexia, Chourmouziadou (2016) found that 77.5 % of the respondents of her research knew that dyslexia is a lifelong condition, and this result is similar to the findings obtained by Wadlington and Wadlington (2005), who revealed that most surveyed educators also knew that dyslexia lasts a lifetime. By contrast, the results from research which was conducted in Spain and Peru demonstrated that 69 % of pre-service teachers and 45 % of in-service teachers who participated in the survey did not know that dyslexia is a lifelong condition (Soriano-Ferrer, Echegaray-Bengoa, Joshi & Joshi, 2016). Similar results were obtained in China (Yin et al., 2019), where the research showed that over 75 % of the surveyed teachers did not know that dyslexia is a life-long condition.

The studies presented thus far have provided evidence that teachers in different countries have just a basic knowledge of dyslexia (Bell et al., 2011; Chourmouziadou, 2016; Gonzalez & Brown, 2019; Knight, 2018; Soriano-Ferrer et al., 2016; Wadlington & Wadlington, 2005; Yin et al., 2019). The researchers strongly believe that relevant professional development for teachers is highly required to provide them with the necessary knowledge and skills to handle dyslexia in the classroom (Chourmouziadou, 2016; Soriano-Ferrer et al., 2016; Wadlington & Wadlington, 2005; Yin et al., 2019). They agree that dyslexia should be analyzed within three main levels: neurological, cognitive and behavioural. The researchers argue that teachers' understanding of dyslexia within these three levels provides a mode for teachers to improve their teaching practices and include all students into the learning process (Chourmouziadou, 2016; Soriano-Ferrer et al., 2016; Wadlington & Wadlington, 2005; Yin et al., 2019).

2.5. Relationship between Teachers' Knowledge of Dyslexia and their Training Experiences

Though recent studies claim that most teachers in different countries demonstrate just a basic knowledge of dyslexia (Barbiero et al., 2019; Chourmouziadou, 2016; Gonzalez & Brown, 2019; Wadlington & Wadlington, 2005), Knight (2018) argues that we should not blame the teachers for their limited knowledge of dyslexia; the focus should be moved from teachers to teacher training programmes in educational institutions, which do not equip teachers with updated knowledge and information about this neurological disorder. Evidence shows that most of the surveyed teachers in different countries mentioned that dyslexia was not covered within their teacher training programmes (Chourmouziadou, 2016; Knight, 2018; Soriano-Ferrer et al., 2016; Wadlington & Wadlington, 2005; Yin et al., 2019). Soriano-Ferrer et al. (2016), revealed that 83.5% of the surveyed teachers answered that they did not receive any training in working with children with dyslexia. Similar results were obtained by Wadlington and Wadlington (2005) who found that 87.8 % of the surveyed educators said that they feel that their education did not prepare them to effectively work with dyslexic learners, and along with this, 88 % of all respondents said that they were interested in furthering their knowledge in regards to dyslexia. Moreover, this

research showed that teachers who expressed interest in further training on dyslexia had better understanding of this learning disability (Wadlington & Wadlington, 2005). Overall, these studies highlight the need for quality training programmes on dyslexia and additional professional development for teachers to raise their awareness of dyslexia and increase their confidence in working with students with dyslexia.

The study conducted by Knight (2018) fully supports the claim that further professional development on dyslexia is vitally important for the effective teaching of students with dyslexia. In her study, Knight (2018) explored the relationship between teachers' understanding of dyslexia and their training experiences. An online survey was completed by approximately 2570 teachers in England and Wales. It was found that 71.8% of surveyed teachers reported that any dyslexia training was inadequate in their teacher training programmes and 50.4% of respondents said that they did not receive any professional development on dyslexia. Based on the research results, Knight (2018) concluded that most respondents had a limited understanding of dyslexia, and that this understanding was mostly related to behavioural factors. It was also shown that there was a lack of knowledge concerning the neurological and cognitive aspects of dyslexia. The researcher argues that evidence-based teacher training, which provides teachers with an up-to-date analysis of the neurological, cognitive and behavioural facets of dyslexia, is pivotal for teachers to be able to meet the needs of learners with dyslexia (Knight, 2018). The author agrees that to diagnose dyslexia is not a teacher's job, but it is important for teachers to have a clear understanding of what dyslexia is to be able to identify the learners who are at risk and provide them with appropriate teaching (Knight, 2018). These results support the idea of previous studies which recommend a significant need for extra professional development on dyslexia for teachers (Chourmouziadou, 2016; Wadlington & Wadlington, 2005).

Considering the results of numerous studies, the researchers suggest that a better support training system for pre-service and in-service teachers is required, and more theoretical and practical training on dyslexia should be organized for teachers to equip them with the necessary

knowledge and strategies to handle dyslexia at school (Chourmouziadou, 2016; Knight, 2018; Soriano-Ferrer et al., 2016; Wadlington & Wadlington, 2005; Yin et al., 2019).

Therefore, the research conducted in the USA (Wadlington & Wadlington, 2005) helped to shape the third hypothesis for the current study:

Hypothesis 3: Teachers who showed interest in further training on dyslexia have a better understanding of dyslexia.

2.6. Research on dyslexia in Kazakhstan

Even though over the past years, there has been a significant volume of published studies about teachers' knowledge of dyslexia in the world, there is a big gap in this area of research in Kazakhstan. The fact that there is no common practice to identify dyslexia in Kazakhstani schools makes it impossible to analyze the prevalence of dyslexia in Kazakhstan. The underestimation of students with dyslexia in state schools might lead to the ineffectiveness of the education system as a whole. Educational researchers argue that if a school fails to diagnose dyslexia, then it will be rather difficult for educators to meet the child's needs in the classroom (Gonzalez & Brown, 2019). Consequently, it might mean that if students with this learning difficulty do not get enough support in the classroom, they are more likely to experience stress and anxiety which might result in antisocial behaviour in the future (Barbiero et al., 2019). Thus, it is becoming obvious that it is indispensable for Kazakhstan to start researching this topic and to identify students with dyslexia in order to provide them with effective educational support and psychological assistance.

The literature review in this thesis has shown that dyslexia is being explored and discussed widely among scientists and educators across the world. Many countries have recognized that dyslexia as a learning disability should be identified and managed within the inclusive education system. Despite the existing disagreement in defining dyslexia, most researchers agree that this condition should be conceptualized within three main levels: neurological, cognitive and behavioural (Elliot & Grigorenko, 2014; Knight, 2018; Riddick, 2010; Rose, 2009; Thomson, 2009; Wadlington & Wadlington, 2005). Most researchers agree that environmental factors play a

significant role in handling dyslexia and, therefore, teachers' knowledge and understanding of dyslexia have a crucial impact on how the needs of learners with dyslexia are met (Elliot & Grigorenko, 2014; Knight, 2018; Riddick, 2010; Rose, 2009; Thomson, 2009; Wadlington & Wadlington, 2005). Evidence shows that appropriate professional development is highly needed for pre-service and in-service teachers to raise their awareness of dyslexia (Chourmouziadou, 2016; Gonzalez & Brown, 2019; Rose, 2009; Wadlington & Wadlington, 2005). The literature review has shown that teachers are more aware of the behavioural characteristics of dyslexia than the neurological and cognitive ones. Therefore, to analyze the situation regarding dyslexia in Kazakhstan, the following hypotheses will be tested in this study:

Hypothesis 1: Teachers' understanding of the neurological and cognitive causes of dyslexia is low.

Hypothesis 2: Teachers know the behavioural characteristics of dyslexia better than the neurological and cognitive ones.

Hypothesis 3: Teachers who showed interest in further training on dyslexia have a better understanding of dyslexia.

Chapter 3: Methodology

3.1. The Focus of the Study

Numerous researchers have focused their investigations on analyzing teachers' knowledge of dyslexia. Unfortunately, evidence shows that most teachers have just a basic understanding of dyslexia (Chourmouziadou, 2016; Knight, 2018; Soriano-Ferrer et al., 2016; Wadlington & Wadlington, 2005; Yin et al., 2019). The main purpose of the current study was to measure the level of teachers' knowledge about dyslexia in the mainstream schools of Akmola region in Kazakhstan and to analyze if the relationship between teachers' knowledge about dyslexia and their training experiences exists. For the purpose of this study, the following research questions were addressed:

1. What is the level of teachers' knowledge of dyslexia in public schools in Akmola region of Kazakhstan?

2. What is the relationship between teachers' understanding of dyslexia and their pre-service and in-service teacher training experiences?

Also, this study tested the following hypotheses:

Hypothesis 1: Teachers' understanding of the neurological and cognitive causes of dyslexia is low.

Hypothesis 2: Teachers know the behavioural characteristics of dyslexia better than the neurological and cognitive ones.

Hypothesis 3: Teachers who showed interest in further training on dyslexia have a better understanding of dyslexia.

Due to the focus of the research, this study applied a survey research design. Survey research is one of the most popular quantitative research designs characterized by collecting data through standard questionnaire forms, which might be administered online (Muijs, 2004; Neuman, 2014). In most recent international studies, teachers' knowledge of dyslexia has been measured through online surveys (Knight, 2014; Soriano-Ferrer et al., 2016; Wadlington & Wadlington, 2005; Yin et al., 2019). According to Cohen (2018), an online survey research design enables researchers to collect quantitative data, analyze it statistically, describe the trends, and to test the research questions and hypotheses in the wider population within a short period of time. Since this method corresponds well to the purpose of this research, which seeks to examine the level of teachers' knowledge of dyslexia in Akmola region of Northern Kazakhstan, and to analyze if the relationship between their knowledge and their training experiences exists, this method was chosen for the current study.

3.2. Survey Questionnaire

To date, various scales and questionnaires have been developed and introduced to measure the level of teachers' knowledge of dyslexia. The most widely used scales which have been employed in recent studies are the Dyslexia Belief Index (DBI), a scale which was created by American researchers Wadlington and Wadlington in 2005, and the Scale of Knowledge and Beliefs about Developmental Dyslexia (KBDDS), which was created by Spanish researchers Soriano-Ferrer

and Echegaray-Bengoa in 2014 (Soriano-Ferrer & Echegaray-Bengoa, 2014; Wadlington & Wadlington, 2005). Both scales have been successfully validated and are geared towards the exploration of teachers' knowledge and beliefs regarding dyslexia. Still, while the DBI (Wadlington & Wadlington, 2005) is more concentrated on the behavioural symptoms of dyslexia and on the analysis of any misconceptions that educators hold about dyslexia, the KBDDS (Soriano-Ferrer & Echegaray-Bengoa, 2014) focuses more on teachers' understanding of the neurological, cognitive and behavioural nature of dyslexia. Since the major objective of this study was to understand what Kazakhstani teachers know about dyslexia across three main levels (neurological, cognitive and behavioural), the data for this research was collected with the use of the KBDDS (Soriano-Ferrer & Echegaray-Bengoa, 2014). This scale consists of 36 items and the results showed a very high degree of reliability and validity after its utilization in Spain, Peru and China (Soriano-Ferrer et al., 2016; Yin et al., 2019). All the items are presented as one-sentence statements with the response options of 'True', 'False' or 'I don't know'. Since the scale has been published and is publicly accessible, it was not required to obtain an additional consent from the developers in the scope of this study. Demographic information questions, such as respondents' age, gender, teaching grade, years of teaching and training experiences were also included in the questionnaire for the present research. As the original scale is in English, it was translated into Kazakh and Russian.

Prior to the large-scale survey, the questionnaire was piloted with five teachers. Firstly, two teachers from mainstream schools of Akmola region answered the questions of the survey chosen for the present research. Both teachers reported that all questions were clear and understandable except questions 10 'Modeling fluent reading is often used as a teaching strategy' and 19 'Multisensory instruction is not an effective training method at the moment'. Since both questions include terminology, the definitions of the terms were provided next to these questions (See Appendices B and C). Then the adapted version of this survey was piloted with the other three mainstream school teachers.

3.3. Sample

The target population of the current study was school teachers from mainstream schools in Akmola region of the northern part of Kazakhstan. According to the Information and Analytical Center (2020), there are 555 mainstream schools in Akmola region, with 13 682 teachers working in these schools. As the population in the region is rather large and widely dispersed (the region consists of 17 districts, two cities of regional significance and 8 towns), it was more reasonable to choose cluster sampling for the research (Cohen et al., 2018; Creswell, 2014). According to Cohen et al. (2018), this type of sampling allows a researcher to select a specific number of schools in the area and recruit teachers from the selected schools for the survey. However, Cohen et al. (2018) warn about the possibility of being biased if a researcher takes only one cluster for the investigation and suggest creating several clusters in order to produce valid outcomes. Thus, to avoid bias in this research, several clusters for the survey were organized in different parts of Akmola region:

- ✓ 5 schools in the Northern part of Akmola region (Kokshetau, Zerenda and Burabai districts),
- ✓ 5 schools in the Central part of Akmola region (Birzhan Sal, Bulandy, Sandyktau and Atbasar districts),
- ✓ 5 schools in the Southern part of Akmola region (Egendykolsky, Tselinogradsky, Arshalynsky and Korgalzhinsky districts),
- ✓ 5 schools in the Western part of Akmola region (Esilsky, Zhaksynsky, Zharkayinsky districts).

This strategy allowed the whole region to be covered, represented and generalized. Only schools with more than 500 students comprising of primary, secondary and high schools were included in the study. The benefit of this approach was that there were more teachers in these schools, and this study was interested to include teachers of all grade levels. The details for distributing the questionnaire to teachers are described in section 'Research Ethics Procedures'.

3.4. Dataset

Once survey data was collected, it was then analyzed in relation to teachers' knowledge of dyslexia across the three main areas: neurological, cognitive, and behavioural. This was to establish if any relationship between teachers' knowledge of dyslexia and their training experiences existed. The analysis of this data addressed the present study's main research questions and tested the research hypotheses.

3.5. Data Analysis

Quantitative analysis was used to measure the level of teachers' knowledge of dyslexia and test the following hypotheses:

Hypothesis 1: Teachers' understanding of the neurological and cognitive causes of dyslexia is low.

Hypothesis 2: Teachers know the behavioural characteristics of dyslexia better than the neurological and cognitive ones.

Hypothesis 3: Teachers who showed interest in further training on dyslexia have a better understanding of dyslexia.

Univariate and bivariate types of analysis were employed to answer the research questions and test hypotheses of the current research. Firstly, a univariate analysis was conducted to analyze the characteristics of the sample. Univariate analysis is descriptive and can give a researcher important information about the research questions and individual variables (Muijs, 2011). Therefore, this statistical test allowed for a descriptive analysis which considered such variables as teachers' training experiences, teaching experience, education level, and teaching grade.

Next, to measure the level of teachers' knowledge of dyslexia, a frequency distribution analysis was employed. Descriptive data was generated for all variables. This information showed how many teachers had a good understanding of dyslexia across the neurological, cognitive and behavioural layers and how many of the surveyed teachers were not well aware of this learning disorder.

Finally, bivariate analysis was run to analyze the relationship between teachers' knowledge of dyslexia and their training experiences. Cross-tabulation analysis was carried out to investigate the relationship between training experiences and teachers' knowledge of dyslexia. The first cross-tabulation analysis was employed to explore the relationship between teachers' knowledge of dyslexia and their pre-service training experiences on dyslexia. The second cross-tabulation analysis was run to analyze the relationship between the level of teachers' knowledge of dyslexia and their additional training experiences on dyslexia. The third cross-tabulation analysis was performed to analyze the relationship between teachers' knowledge of dyslexia and their interest in further training on dyslexia. Also, in order to analyze whether teachers who are interested in further training on dyslexia have better awareness of dyslexia than those teachers who are not interested in further training, Z-test of proportions was conducted. Z-test of proportions was chosen over the chi-square test due to the insufficient number of observations per cell which would yield an unreliable chi-square result (Muijs, 2011).

3.6. Research Ethics Procedures

Since the study was conducted in the form of an online survey, it was necessary to take all measures to protect the anonymity and confidentiality of the potential respondents. Cohen et al. (2018) stress that schools are "hierarchical institutions" (p.120), and this might have a certain impact on participants. Therefore, it is pivotal for educational researchers to think about the effect their research might have on the teachers participating in their research. The anonymity and confidentiality of respondents should be respected in order to protect their privacy (Cohen et al., 2018; Creswell, 2014). For that reason, all ethical precautions were considered and strictly followed by the researcher.

Prior to undertaking the investigation, an application for the ethics review of this research was submitted to the Nazarbayev University Research Ethics Committee of the School of Education. As soon as the approval was obtained, permission from the Department of Education of Akmola region to conduct the research in 20 schools of Akmola region was gained. As a response

to the researcher's request to allow this study in public schools of the region, the Department of Education of Akmola region contacted the principals of the schools selected for the sample in this study and asked them to distribute the anonymous link to the survey among their school teachers. The school administration of each school was provided with an email which contained full information about the research, including the purpose of the study, and any confidentiality and anonymity issues. This email also included the link to the survey so that the principals could share the survey link and the consent letter with their teachers. The respondents of the research were informed about the purpose of the study, and any confidentiality and anonymity issues. They were also informed that their participation is voluntary, and they have the right to withdraw and not to answer questions at any time. The data collection process via the survey took place in November 2020. The full text of the letter as well as the electronic survey is enclosed in the appendices in this thesis.

The data collection process for this research was conducted using the Qualtrics Survey Platform. This platform allows an opportunity to collect information anonymously by providing respondents with an anonymous link (Qualtrics, 2020). This link does not collect identifying information such as names or email addresses, and it is not possible to link the answers with the individual respondents of the survey. All the dataset was anonymized in the Qualtrics platform so that no answer could be traced back to an individual respondent.

To preserve confidentiality, any identifying information about respondents was not discussed with anyone except the supervisor of this research. Since the Department of Education of Akmola region was involved in the process of the survey distribution among the public schools selected for the research in Akmola region, the names of research sites were known to one of the managers of the Department. However, any other identifying information about respondents was not revealed to them. Creswell (2014) highlights the need for researchers to "be careful about reporting a small subset of results that will disclose the identity of specific individuals" (p.402). This is not the case in the present research as it reports aggregate quantitative data. Still, to protect

data privacy, all primary data was kept in a password-protected personal laptop which was accessible to the researcher only. The full information about the research, including the purpose of the study, and any confidentiality and anonymity issues, was explained clearly to participants at the beginning of the survey. Survey respondents were asked whether they agree to participate in this survey or not. Only when they responded 'Yes', they were taken to survey questions. If they clicked 'No', they were thanked for their participation and were led to exit the survey.

Chapter 4: Findings

4.1. Demographic Characteristics of Respondents

This chapter will report findings of the present research which aims to measure teachers' knowledge about dyslexia and explore the relationship between teachers' knowledge about dyslexia and their training experiences. The chapter is divided into three main sections: demographic characteristics of respondents, the results obtained from the Scale of Knowledge and Beliefs about Developmental Dyslexia (KBDDS), and an analysis of the relationship between teachers' training experiences and their knowledge about dyslexia.

An anonymous link to the survey was sent to teachers of 20 schools in Akmola region of Northern Kazakhstan. Overall, 1435 teachers participated in the survey. Almost 89 % (N= 1275) of teachers completed the survey which included both demographic and dyslexia questions. A smaller number (11 %, n=160) of teachers did not answer the questions about dyslexia and completed only demographic questions. The teachers who did not answer the questions about dyslexia were excluded from the analysis.

The sample consisted mostly of females. As shown in Table 1, a larger proportion of females (83.86%, n =1143) than males (16.14 %, n = 220) participated in the study. This could be explained by the fact that gender imbalance exists in the teaching profession in Kazakhstan (Information and Analytical Center, 2020). There are more female teachers than male teachers in schools across the country.

As shown in Table 1, over half of the surveyed teachers (51.99 %, n =704) indicated that their highest education level was a bachelor's degree. A relatively small proportion of respondents (4.65%, n = 63) had a master's degree, and 22.23% (n = 301) had a specialist diploma. Almost 38 % (n = 516) of the respondents reported that their teaching experience was more than 21 years. Less than a third of those surveyed (26.27 %, n = 358) indicated their teaching experience was between 10 and 20 years. The remaining respondents (35.87 %, n = 489) indicated their teaching experience as less than 10 years.

Table 1*Demographic Characteristics of Dyslexia*

Background Variables		N	Total
Gender	Male	220 (16.14%)	1363
	Female	1143 (83.86 %)	
The Highest Level of Education	Bachelor Degree	704 (51.99 %)	1354
	Specialist Degree	301 (22.23 %)	
	Master Degree	63 (4.65%)	
	Doctoral Degree (Doctor of Science or Ph.D)	-	
	Other	286 (21.12 %)	
Teaching Years	0-2 years	135 (9.90%)	1363
	3-5 years	164 (12.03%)	
	6-10 years	190 (13.94%)	
	11-15 years	198 (14.53%)	
	16-20 years	160 (11.74%)	
	21+ years	516 (37.86%)	
Teaching Subject	All Subjects in Primary school	328 (21.26%)	1543
	Kazakh language and literature	180 (11.67%)	
	Russian language and literature	102 (6.61%)	
	Mathematics (algebra, geometry), Physics, ICT	212 (13.74%)	
	Chemistry, Biology	84 (5.45%)	
	History (History of Kazakhstan, World History), Geography	122 (7.91 %)	
	Foreign language (English, German, French, etc.)	142 (9.20%)	
	Art, Self-knowledge, Technology / Handicraft (craft)	137 (8.88%)	
	Physical Education	102 (6.61%)	
	Other (Natural science, Military training, etc.)	134 (8.68 %)	

The Coverage of Dyslexia during Pre-service Teacher Education Programme	None	688 (50.81 %)	1354
	Some	511 (37.74%)	
	High	155 (11.45%)	
Additional Training on Dyslexia	Yes, I have had.	323 (23.91%)	1351
	No, I haven't had.	1028 (76.09%)	
Participation in Further Additional Professional Development Courses on Dyslexia	Yes	665 (49.26%)	1350
	No	208 (15.41%)	
	I don't know	477 (35.33%)	

One of the most significant findings was that 50.81% (n = 688) of the surveyed teachers responded that they did not cover dyslexia during their pre-service teacher education programmes. More than a third of the respondents (37.74%, n = 511) indicated that dyslexia was not covered well in their pre-service teacher education programmes. Only 11.45% (n = 155) responded that they studied dyslexia at a high level within their pre-service education programmes. Moreover, 76.09% (n = 1028) of those surveyed reported that they did not have any additional training on dyslexia. Only half of the respondents (49.26%, n = 665) answered that they would like to participate in additional professional development courses on dyslexia while 15.41% (n = 208) did not want to participate in such courses. More than a third (35.33%, n = 477) of the surveyed teachers responded that they do not know whether they wanted to participate in additional professional development courses on dyslexia.

4.2. The results of the Scale of Knowledge and Beliefs about Developmental Dyslexia

To examine teachers' knowledge of dyslexia, the Scale of Knowledge and Beliefs about Developmental Dyslexia (KBDDS) was utilized. The scale consists of 36 one-sentence statements with the response options of 'True', 'False', or 'I don't know'. Overall, 1275 teachers completed the questionnaire. As the respondents were free to skip the questions, only the valid percentage of responses is presented here. This section is divided into five main parts based on the survey questions. The first part presents teachers' knowledge concerning general information about

dyslexia; the second part reports the results about teachers' knowledge of the neurological and cognitive factors of dyslexia; the third part presents teachers' knowledge about the symptoms of dyslexia and the fourth and the fifth parts describe what teachers know about the treatment of dyslexia and about its identification process.

4.2.1. Teachers' Knowledge on General Information about Dyslexia

The fact that dyslexia is a lifelong condition is well-known among scientists and educators. Results obtained in the present research show that half of the surveyed teachers do not know that dyslexia is a chronic condition and that it lasts for a lifetime. As shown in Table 2, more than half of those surveyed (53.30%, $n = 597$) reported that they do not know that 'dyslexia refers to a relatively chronic condition that is often not completely overcome' (Item 29). Only 291 (25.98%) teachers out of 1120 who responded to this item knew that dyslexia is a chronic condition. More than 20 % ($n = 232$) of the respondents answered that dyslexia is not a chronic condition. Similarly, almost half of the teachers (44.64%, $n = 496$) indicated that they do not know that most dyslexic learners continue to have reading problems after they graduate from school (Item 30). Similar results were obtained from Item 35. Nearly half (49.01%, $n = 545$) of those who responded to this item, reported that they do not know that dyslexia lasts for a long time. These results suggest that although some teachers provided correct answers about the duration of dyslexia, the majority of teachers do not know that dyslexia is chronic and can last for a lifetime.

Table 2

Dyslexia is a Life-long Condition

No	Item	True	False	I don't know	Total
29	Dyslexia refers to a relatively chronic condition that is often not completely overcome.	291 (25.98%)	232 (20.71%)	597 (53.30%)	1120
30	Many students with dyslexia continue to have reading problems as adults.	468 (42.12%)	147 (13.23%)	496 (44.64%)	1111
35	Dyslexia usually lasts for a long time.	480 (43.17%)	87 (7.82%)	545 (49.01%)	1112

Note. Items 29, 30, 35 'True' is the correct answer.

Regarding the connection between dyslexia and intelligence, there is an idea that all people with dyslexia are intelligent. This idea is relatively popular in the media, but in fact, it does not reflect reality. Evidence shows that dyslexic people, just as people without dyslexia, have a broad spectrum of intelligence: they might be gifted, they might be of average intelligence or of less than average intelligence (Thomson, 2009). Interestingly, of the 1187 teachers who responded to Item 3 in the current research 'A child can be dyslexic and gifted', 62.26% (n = 739) knew that children with dyslexia could be gifted and talented (Table 3). The fact that 62% of those who completed the questionnaire understand that learners with dyslexia can be gifted is very encouraging as it means that almost two-thirds of the respondents knew that dyslexia is not connected to intelligence and that children with dyslexia can be bright regardless of the difficulties they experience in learning. Still, it should be mentioned that approximately one-third of the respondents (28.14 %, n = 334) indicated that they do not know whether 'a child can be dyslexic and gifted'. As shown in Table 3, one more interesting finding is that more than half of the surveyed teachers (56.58%, n = 636) knew that people with dyslexia are not stupid and lazy. However, nearly one-third of the respondents (31.32%, n = 352) reported that they do not know whether the statement 'people with dyslexia are not stupid or lazy' (Item 21) is true or false. Also, it is important to note that of the 1149 who responded to Item 11 'People with dyslexia have below average intelligence', almost half of the surveyed teachers (46.21%, n = 531) knew that this statement is false, but 39.08 % (n = 449) of those surveyed indicated that they do not know whether it is true or false. This is a significant outcome since it shows that one-third of the surveyed teachers revealed that they do not know the answer to the questions which are focused on dyslexia and intelligence; therefore, it might be suggested that professional development on dyslexia is highly required for teachers in Akmolá region.

Table 3*Dyslexia and Intelligence*

Nº	Item	True	False	I don't know	Total
3	A child can be dyslexic and gifted.	739 (62.26%)	114 (9.60%)	334 (28.14%)	1187
11	People with dyslexia have below average intelligence.	169 (14.71%)	531 (46.21%)	449 (39.08%)	1149
21	People with dyslexia are not stupid or lazy. Knowing about the term helps children.	636 (56.58%)	136 (12.10%)	352 (31.32%)	1124

Note. Items 3,21 'True' is the correct answer, Item 11 'False' is the correct answer.

As was mentioned in the literature review chapter, the International Association of Dyslexia (2020) estimates that nearly 5% of the whole school-age population experience learning difficulties connected with dyslexia. According to the results obtained in the current research, half (50, 95%, n= 587) of those who completed the questionnaire did not know that 'about 5% of school-age students have dyslexia' (Item 7). It can be seen from the data in Table 4 that only 40.63% (n = 468) of those who responded to Item 7 knew that it is true. Also, in response to Item 16, almost 14 % (n = 152) of the respondents mistakenly believed that 'all poor readers have dyslexia'. More than a third of the surveyed teachers (30.27 %, n = 346) indicated they do not know whether all poor readers have dyslexia. Still, it should be highlighted that more than half (56.43%, n = 645) of those surveyed reported that not all poor readers have dyslexia. However, only a minority of respondents (19.56%, n = 220) could indicate that 'students who have reading disabilities without an apparent cause are called dyslexic' (Item 20).

Table 4*Who has Dyslexia?*

Nº	Item	True	False	I don't know	Total
7	Most studies indicate that about 5% of school-age students have dyslexia.	468 (40.63%)	97 (8.42%)	587 (50.95%)	1152
16	All poor readers have dyslexia.	152 (13.30%)	645 (56.43%)	346 (30.27%)	1143

20	Students who have reading disabilities without an apparent cause are called dyslexic.	220 (19.56%)	464 (41.24%)	441 (39.20%)	1125
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Note. Items 7, 20 'True' is the correct answer, Item 16 'False' is the correct answer.

Recently research has examined the effects of dyslexia on the emotional consequences and self-esteem of dyslexic students. Evidence shows that dyslexia has destructive effects on some children's lives (Riddick, 2010). Numerous researchers and educators point out that they have found that dyslexic children have emotional problems and low self-esteem compared with children without dyslexia (Livingston et al., 2018; Riddick, 2010; Thomson, 2009). The results obtained from the present research show that 49.87 % (n = 581) and 40.16% (n = 449) of the surveyed teachers knew that dyslexic children often have emotional and social disabilities and low self-esteem (Table 5). However, 34.08 % (n = 397) and 43.47% (n = 486) of the respondents did not know that learners with dyslexia have emotional and social problems (Items 4 and 31). A minority of the respondents (16.05% and 16.37%) unfairly believed that dyslexia does not have a devastating impact on children with dyslexia. Overall, these results indicate that almost half of the surveyed teachers are not well aware of the emotional problems that dyslexic children experience.

Table 5

Emotional Consequences of Dyslexia

No	Item	True	False	I don't know	Total
4.	Dyslexic children often have emotional and social disabilities.	581 (49.87%)	187 (16.05%)	397 (34.08%)	1165
31.	Many students with dyslexia have low self-esteem.	449 (40.16%)	183 (16.37%)	486 (43.47%)	1118

Note. Items 4,31 'True' is correct.

As was pointed out in the introduction to this thesis, heated discussions have been created around the notion of dyslexia. Many scholars agree that some myths and misconceptions exist about dyslexia, but they all stress that dyslexia is not a myth and, on the contrary, reliable scientific evidence proves that dyslexia exists (Elliot and Grigorenko, 2014; Riddick, 2010; Thomson, 2009). In the current research, only a small number of the respondents (7.57 %, n = 85) reported that they

think that dyslexia does not exist. Of the 1123 teachers who responded to Item 25 'I think dyslexia is a myth, a problem that does not exist', more than half (56.72%, n = 637) indicated that dyslexia is not a myth. Still, 35.71% (n = 401) of the surveyed teachers answered that they do not know the answer to this question. Despite the fact that more than half of the surveyed teachers (56.72%, n = 637) knew that dyslexia is not a myth, there is still a significant proportion of teachers (35.71%, n = 401) who revealed that they do not know whether it is true or false. The results in this section answer the first research question of the present paper and confirms Hypothesis 1 by indicating that teachers' knowledge of general information about dyslexia is relatively low.

4.2.2. Teachers' Knowledge of the Neurological and Cognitive Nature of Dyslexia

The fact that dyslexia has a neurological origin has been established by the innovative scientific methods (Breznitz, 2008; Elliot & Grigorenko, 2014). Evidence shows that dyslexia is a neurological condition and that the cause of this condition lies in differences in the brains of people with and without dyslexia (Elliot & Grigorenko, 2014; Riddick, 2010; Thomson, 2009). In the scale applied in this research, two items focused on the neurological origin of dyslexia: Item 1 'Dyslexia is the result of a neurologically-based disorder.' and Item 5 'The brains of individuals with dyslexia are different from those of people without dyslexia.'. Table 6 shows that of the 1216 respondents who completed the questionnaire, only 601 (49.42%) indicated that dyslexia results from a neurologically based disorder. Over a third of the surveyed teachers (34.79%, n = 423) revealed that they did not know that dyslexia has a neurological origin and 192 (15.79%) teachers wrongly believed that dyslexia is not a neurological disability. In response to Item 5, more than one-third of the teachers (37.47%, n = 435) provided correct answers reporting that the brains of people with and without dyslexia are different. Nearly 40 % of those surveyed (39.79%, n = 462) responded that they do not know the answer to this item and 264 teachers (22.74%) wrongly believed that the brains of dyslexic people are not different from the brains of people who do not suffer from this condition.

One more influential factor of dyslexia which teachers should be aware of is the genetic basis of dyslexia (Elliot & Grigorenko, 2014; Rose, 2009; Stein, 2008; Thomas, 2009). Numerous scientists and researchers highlight that genes play a significant role in dyslexia, and it can pass from parents to a child (Elliot & Grigorenko, 2014; Stein, 2008; Thomas, 2009). As shown in Table 6, in the current research, only 256 (22.26%) out of the 1150 surveyed teachers knew that dyslexia is hereditary. Almost half of the respondents (45.22 %, n = 520) did not know the answer to this question, and 32.52% (n = 374) of the respondents answered that dyslexia is not hereditary. These results suggest that teachers are not well aware of the neurological characteristics of dyslexia.

Table 6*The Neurological Nature of Dyslexia*

No	Item	True	False	I don't know	Total
1	Dyslexia is the result of a neurologically based disorder.	601 (49.42%)	192 (15.79%)	423 (34.79%)	1216
5	The brains of individuals with dyslexia are different from those of people without dyslexia.	435 (37.47%)	264 (22.74%)	462 (39.79%)	1161
6	Dyslexia is hereditary.	256 (22.26%)	374 (32.52%)	520 (45.22%)	1150

Note. Items 1,5,6 'True' is the correct answer.

When it comes to teachers' knowledge of the cognitive characteristics of dyslexia, a significant gap can be observed in teachers' responses. As can be seen from Table 7, more than one-third of the surveyed teachers (40.47%, n = 467) did not know that 'children with dyslexia are more consistently impaired in phonemic awareness' (Item 9) while 141(12.22%) respondents reported that dyslexic children usually do not experience problems connected with phonemic awareness. Similar responses were received to Item 2 'Dyslexia is caused by visual-perception deficits, producing the reversal of letters and words'. More than one-third of those surveyed (34.19%, n = 399) revealed that they do not know whether this statement is true or false. Almost half of the surveyed teachers (46.79%, n = 546) mistakenly believed that 'dyslexia is caused by visual-perception deficits, producing the reversal of letters and words' and only 19.02% of respondents

reported that it is false. This information should be taken into consideration since the obtained data shows that a significant proportion of the surveyed teachers are not well aware of the neurological and cognitive nature of dyslexia. These results confirm Hypothesis 1 of the current research and suggest that teachers' understanding of the neurological and cognitive causes of dyslexia is relatively low.

Table 7*The Cognitive Characteristics of Dyslexia*

No	Item	True	False	I don't know	Total
2	Dyslexia is caused by visual-perception deficits, producing the reversal of letters and words.	546 (46.79%)	222 (19.02%)	399 (34.19%)	1167
9	Children with dyslexia are more consistently impaired in phonemic awareness (i.e ability to hear and manipulate sounds in language) than any other ability.	546 (47.31%)	141 (12.22%)	467 (40.47%)	1154

Note. Item 2 'False' is the correct answer, Item 9 'True' is the correct answer.

4.2.3. Teachers' Knowledge of the Behavioural Characteristics of Dyslexia

Acquiring a deep understanding of the neurological and cognitive difficulties that students with dyslexia experience enables teachers to recognize the symptoms of dyslexia in children and provide high quality interventions for such learners. Elliot and Grigorenko (2014) argue that the phonological deficit is considered by numerous neuroscientists and linguists as one of the dominant cognitive aspects that influences dyslexia. Moreover, several lines of evidence suggest that phonemic awareness is one of the strongest predictors of dyslexia (Elliot & Grigorenko, 2014). In the current research, as can be seen in Table 8, in response to Item 14 'Difficulty with the phonological processing of information is one of the most important deficits in dyslexia', almost half of the surveyed teachers (45.53%, n = 519) indicated that they do not know that phonological processing is a significant factor that can cause dyslexia.

One more factor that can help teachers to identify dyslexia is difficulties connected with learning to read fluently. Numerous scholars define dyslexia as a learning disorder that mainly affects the skills needed for accurate and fluent reading and spelling (Rose, 2009). It is now well established from a variety of researchers that these difficulties emerge regardless of effective classroom teaching, normal intelligence and socio-cultural background (IDA, 2002). The results, obtained in the present survey, show that while half of the surveyed teachers (51.31%, n = 588) knew that 'dyslexia is often characterized by inaccuracy and lack of fluency' (Item 12), more than one-third (37.17%, n = 426) of the respondents indicated that they do not know these characteristics of dyslexia. As shown in Table 8, similar answers were given to Item 36 'Dyslexia is characterized by difficulty with learning to read fluently'. More than half of the teachers (57.81%, n = 644), who responded to this item, reported that difficulty in learning to read fluently is one of the main features of dyslexia, whilst 34.74% (n = 387) of those surveyed reported that they do not know whether it is true or false. Turning now to the difficulties connected with spelling which learners with dyslexia experience, the table below illustrates that the majority of the surveyed teachers (60.70%, n = 678) knew that students with dyslexia 'tend to spell words wrong' (Item 34). Still, of the 1117 teachers who responded to this item, almost one-third of the respondents (32.05%, n = 358) did not know the answer to this question. Only a minority of those surveyed (7.25%, n = 81) mistakenly believed that learners with dyslexia do not tend to spell words wrong.

As was mentioned in the previous sections, many myths and misconceptions exist around dyslexia and one of the widely spread misconceptions which surrounds this condition is that one of the basic characteristics of dyslexia is seeing letters and words backwards (Chourmouziadou, 2016; Wadlington & Wadlington, 2005). In the current research, as Table 8 shows, more than one-third of the surveyed teachers (35.44%, n = 404) also believed that 'seeing letters and words backwards is a basic characteristic of dyslexia' and 42.63% (n = 486) of those surveyed did not know whether seeing letter and words backwards is the main symptom of dyslexia or not.

Table 8*The Behavioural Characteristics of Dyslexia*

No	Item	True	False	I don't know	Total
12	The reading of students with dyslexia is often characterized by inaccuracy and lack of fluency.	588 (51.31%)	132 (11.52%)	426 (37.17%)	1146
13	Seeing letters and words backwards is a basic characteristic of dyslexia	404 (35.44%)	250 (21.93%)	486 (42.63%)	1140
14	Difficulty with the phonological processing of information is one of the most important deficits in dyslexia.	485 (42.54%)	136 (11.93%)	519 (45.53%)	1140
34	Dyslexics tend to spell words wrong.	678 (60.70%)	81 (7.25%)	358 (32.05%)	1117
36	Dyslexia is characterized by difficulty with learning to read fluently.	644 (57.81%)	83 (7.45%)	387 (34.74%)	1114

Note. Items 12, 14, 34, 36 'True' is the correct answer, Item 13 'False' is the correct answer.

The results in this section demonstrate that although a significant proportion of teachers know the behavioural characteristics of dyslexia, a considerable number of teachers are still not well aware of the signs which could be used to help with the identification of dyslexia.

To test Hypothesis 2 'Teachers know the behavioural characteristics of dyslexia better than the neurological and cognitive ones', the statements that indicated teachers' knowledge of the neurological, cognitive and behavioural characteristics of dyslexia were chosen for an analysis of the teachers' answers. The frequency of correct answers was compared between two groups: the neurological and cognitive characteristics of dyslexia and the behavioural characteristics of dyslexia. If the correct answers given by teachers to statements indicating their knowledge of the neurological and cognitive factors (Table 9) are compared with the answers given to the statements indicating the behavioural factors (Table 10), it becomes apparent that teachers are more aware of the behavioural characteristics of dyslexia than of the neurological and cognitive ones. These results show that Hypothesis 2 of the current research was confirmed and although teachers showed that

they have some misunderstandings of the behavioural facet of dyslexia, they know the behavioural characteristics better than the neurological and cognitive ones.

Table 9*Teachers' Knowledge of the Neurological and Cognitive Characteristics of Dyslexia*

№	Items which Indicate Teachers' Knowledge of the Neurological and Cognitive Characteristics of Dyslexia	N (valid)	Valid Percentage of Correct Answers	Frequency (correct answers)
1	Dyslexia is the result of a neurologically-based disorder.	1216	49.4	601
2	Dyslexia is caused by visual-perception deficits, producing the reversal of letters and words.	1167	19	222
5	The brains of individuals with dyslexia are different from those of people without dyslexia.	1161	37.5	435
6	Dyslexia is hereditary	1150	22.3	256
9	Children with dyslexia are more consistently impaired in phonemic awareness (i.e ability to hear and manipulate sounds in language) than any other ability	1154	47.3	546

Table 10*Teachers' Knowledge of the Behavioural Characteristics of Dyslexia*

№	Items which Indicate Teachers' Knowledge of the Behavioural Characteristics of Dyslexia	N (valid)	Valid Percentage of Correct Answers	Frequency (correct answers)
11	People with dyslexia have below average intelligence	1149	46.2	531
12	The reading of students with dyslexia is often characterized by inaccuracy and lack of fluency.	1146	51.3	588
13	Seeing letters and words backwards is a basic characteristic of dyslexia.	1140	21.9	250
14	Difficulty with the phonological processing of information is one of the most important deficits in dyslexia.	1140	42.5	485
32	Children with dyslexia have problems with decoding and spelling but not with listening comprehension.	1107	49.7	550
34	Dyslexics tend to spell words wrong	1117	60.7	678
36	Dyslexia is characterized by difficulty with learning to read fluently	1114	57.8	644

4.2.4. Teachers' Knowledge on Treatment of Dyslexia

Another myth that exists about dyslexia is connected to the strategies that can help to adapt to this condition. People wrongly believe that dyslexia can be overcome with the help of colored lenses or colored overlays. As shown in Table 11, present research shows that more than half (59.04%, $n = 673$) of those who responded to item 17 'Children with dyslexia can be helped by using colored lenses/colored overlays' said that they do not know whether it is true or false. Almost 18 % ($n = 199$) of respondents mistakenly believed that colored lenses/colored overlays can help students with dyslexia to adapt to their condition and only 23.51 % ($n = 268$) out of 1140 who responded to this item knew that it is not true. Interestingly, 15.93% ($n = 181$) of the respondents think that medications can help learners with dyslexia which is not actually true, according to up-to-date research. Numerous neuroscientists and educational researchers stated that dyslexia is not a disease and therefore cannot be cured by medications (IDA, 2020). However, more than half of the surveyed teachers (54.23%, $n = 616$) reported that they do not know whether 'physicians can prescribe medications to help students with dyslexia' or not (Table 11).

Table 11

Treatment of Dyslexia

No	Item	True	False	I don't know	Total
17	Children with dyslexia can be helped by using colored lenses/colored overlays.	199 (17.46%)	268 (23.51%)	673 (59.04%)	1140
18	Physicians can prescribe medications to help students with dyslexia.	181 (15.93%)	339 (29.84%)	616 (54.23%)	1136

Note. Items 17, 18 'False' is the correct answer.

It is now well established from a variety of studies that systematic, multisensory and phonologically based teaching is a highly effective approach to tackle reading problems for children with dyslexia (Riddick, 2010; Rose, 2009; Elliot & Grigorenko, 2014). In the current research, as can be seen from Table 12, over half of the surveyed teachers (51.99%, $n = 588$) reported that they do not know whether multisensory instruction is an effective teaching method or not. Nearly one-

third (31.48%, n = 356) of those who responded to Item 19 'Multisensory instruction is not an effective training method at the moment' wrongly believed that it is true. Only 16.53% (n = 187) of the surveyed teachers indicated that multisensory teaching is an effective strategy to teach learners with dyslexia. However, almost half (49.64%, n = 553) of those who responded to Item 28 knew that learners with dyslexia 'need structured, sequential, direct instruction in basic skills and learning strategies.' Still, of the 1114 teachers who answered to this item, approximately 43% (n = 471) indicated that they do not know the answer to this question. Similar results were obtained to Item 23 'Intervention programs that emphasize the phonological aspects of language with the visual support of letters are effective for students with dyslexia'. More than half (52.27%, n = 586) of those surveyed knew that the focus on the phonological aspects of language in teaching is an effective strategy for learners with dyslexia while 40.14% (n = 450) of the respondents did not know that phonologically based instruction with the visual support is effective for students with dyslexia. In response to Item 10 'Modeling fluent reading is often used as a teaching strategy', more than one-third of the surveyed teachers (37.78%, n = 428) reported that they do not know whether it is true or false, but almost half of the surveyed teachers (47.40%, n = 537) knew that 'modeling fluent reading is often used as a teaching strategy'. Interestingly, almost two-thirds of the surveyed teachers (65.78%, n = 738) knew that 'repeated reading techniques are useful reading material to improve reading fluency' (Item 26). Overall, these results suggest that significant knowledge gaps of methods and strategies that support learners with dyslexia among the surveyed teachers exist.

Table 12*Teaching Strategies*

No	Item	True	False	I don't know	Total
10	Modeling fluent reading is often used as a teaching strategy.	537 (47.40%)	168 (14.83%)	428 (37.78%)	1133
19	Multisensory instruction is not an effective training method at the moment.	356 (31.48%)	187 (16.53%)	588 (51.99%)	1131
23	Intervention programs that emphasize the phonological aspects of language with the visual support	586 (52.27%)	85 (7.58%)	450 (40.14%)	1121

	of letters are effective for students with dyslexia.				
26	Repeated reading techniques are useful reading material to improve reading fluency.	738 (65.78%)	108 (9.63%)	276 (24.60%)	1122
28	Students with dyslexia need structured, sequential, direct instruction in basic skills and learning strategies.	553 (49.64%)	90 (8.08%)	471 (42.28%)	1114

Note. Items 10, 23, 26, 28 'True' is the correct answer, Item 19 'False' is the correct answer.

4.2.5. Identification Process

The identification process plays a crucial role in teaching learners with dyslexia. It is generally recognized that early identification gives better chances for children with dyslexia to adapt to difficulties they experience (Rose, 2009). Until recently intelligence tests were considered to be a decisive component in the diagnostic process of dyslexia, but now the International Dyslexia Association (2019) says that cognitive or intelligence testing is not necessary for identifying dyslexia (IDA, 2019). As can be seen from the results obtained in the current research (Table 13), almost half of the teachers (45.28 %, n = 513), who responded to Item 15, thought that intelligence tests are useful in the identification process of dyslexia. More than one-third of those surveyed (35.39%, n = 401) reported that they do not know whether intelligence tests are useful or not in identifying dyslexia. As for the administration of individual reading tests as one of the effective tools in identifying dyslexia, more than half of the teachers (58.21%, n = 645) who responded to Item 33 knew that 'applying an individual reading test is essential to diagnosing dyslexia'. More than one-third (34.57%, n = 348) of the surveyed teachers reported that they do not know if this statement is true or false. Only a minority of respondents (7.22%, n = 80) mistakenly believed that an individual reading test is not essential in the identification of dyslexia. Interestingly, in response to Item 22 'Giving students with dyslexia accommodations, such as extra time on tests, shorter spelling lists, special seating, etc., is unfair to other students', only one-third of the surveyed teachers (35.95%, n = 403) did not agree with this statement while 27.03 % (n = 303) of those surveyed thought that it is true. More than one-third (37.02%, n = 415) of teachers reported that they do not know the answer to this question.

Table 13*Identification Process*

No	Item	True	False	I don't know	Total
15	Intelligence tests are useful in identifying dyslexia.	513 (45.28%)	219 (19.33%)	401 (35.39%)	1133
22	Giving students with dyslexia accommodations, such as extra time on tests, shorter spelling lists, special seating, etc., is unfair to other students.	303 (27.03%)	403 (35.95%)	415 (37.02%)	1121
33	Applying an individual reading test is essential to diagnosing dyslexia.	645 (58.21%)	80 (7.22%)	383 (34.57%)	1108

Note. Items 15, 22 'False' is the correct answer, Item 33 'True' is the correct answer.

Taken together, these results provide important insights into teachers' knowledge of dyslexia in Akmola region of Kazakhstan. The answer to Research Question 1 of the current research might be formulated as follows: the results obtained within the survey indicate that a considerable proportion of the surveyed teachers are not well aware of dyslexia. Although some teachers demonstrated a good awareness of dyslexia, a significant proportion of the surveyed teachers do not have a deep understanding of dyslexia across the neurological, cognitive and behavioural layers.

4.3. The Relationship between Teachers' Knowledge of Dyslexia and their Training Experiences

Experiences

This section will focus on the influence of teachers' training experience factors on their knowledge of dyslexia. Bivariate analysis was run to analyze whether any relationship between teachers' knowledge and their training experiences exists. Cross-tabulation was employed to explore the relationship between teachers' knowledge of dyslexia and their pre-service training experience, additional training experience, and teachers' interest in further training on dyslexia. For this purpose, the following three questions were included in the demographic part of the questionnaire:

- ✓ Have you covered dyslexia during your pre-service teacher education programme? (with response options 'None', 'Some', 'High');

- ✓ Have you had additional training on dyslexia? (with response options 'Yes', 'No');
- ✓ Would you like to participate in additional professional development courses on dyslexia? (with response options 'Yes', 'No', 'I don't know').

The results obtained are presented in Tables 14,15 and 16. It can be seen from the data in Table 14, that only a minority of teachers from the group of teachers who reported that they had covered dyslexia during their teacher education programme at a high or satisfactory level showed a good knowledge of dyslexia. As shown in Table 14, of the 581 surveyed teachers who indicated that they had covered dyslexia within teacher education programme, only 301 knew that 'dyslexia is the result of a neurologically-based disorder'. Interestingly, the number of teachers who gave correct answers to the questions that measure their knowledge of the behavioural facet of dyslexia is higher than the number of teachers who gave correct answers to the questions indicating their knowledge of the neurological and cognitive factors of dyslexia. This is additional evidence that confirms Hypothesis 2, which says that teachers know the behavioural characteristics of dyslexia better than the neurological and cognitive ones. The fact that only a small number of teachers from the group of teachers who reported that they had covered dyslexia during their teacher education programme have a good understanding of dyslexia implies that the quality of the training on dyslexia within teacher education programmes might not have been substantial.

Table 14

Teachers' Knowledge of Dyslexia and their Pre-service Training Experiences on Dyslexia

Scale of Knowledge and Beliefs about Developmental Dyslexia	Total Number of Teachers Responding to the Question (N)	Teachers who reported that they have covered dyslexia during their pre-service teacher education programme at a high or satisfactory level (N)	Correct answers of teachers who had covered dyslexia during their pre-service teacher education programme at a high or satisfactory level (N)
Neurological and Cognitive Characteristics			

1. Dyslexia is the result of a neurologically-based disorder.	1201	581 (48.38 %)	310 (51.81%)
2. Dyslexia is caused by visual-perception deficits, producing the reversal of letters and words.	1154	570 (49.39 %)	122 (21.40 %)
5. The brains of individuals with dyslexia are different from those of people without dyslexia.	1152	566 (49.13 %)	222 (39.22 %)
6. Dyslexia is hereditary	1140	558 (48.95 %)	147 (26.34 %)
9. Children with dyslexia are more consistently impaired in phonemic awareness (i.e ability to hear and manipulate sounds in language) than any other ability	1145	564 (49.26 %)	284 (50.35 %)

Behavioural Characteristics

11. People with dyslexia have below average intelligence	1140	560 (49.12 %)	270 (48.21 %)
12. The reading of students with dyslexia is often characterized by inaccuracy and lack of fluency.	1137	558 (49.08 %)	314 (56.27 %)
13. Seeing letters and words backwards is a basic characteristic of dyslexia.	1131	551 (48.72 %)	131 (23.77 %)
14. Difficulty with the phonological processing of information is one of the most important deficits in dyslexia.	1132	550 (48.59 %)	253 (46 %)
32. Children with dyslexia have problems with decoding and spelling but not with listening comprehension.	1099	539 (49.04 %)	280 (51.95 %)
34. Dyslexics tend to spell words wrong	1108	546 (49.28 %)	357 (65.38 %)
36. Dyslexia is characterized by difficulty with learning to read fluently	1105	541 (48.96 %)	339 (62.66 %)

General Knowledge

3. A child can be dyslexic and gifted	1176	577 (49.06 %)	392 (67.94 %)
4. Dyslexic children often have emotional and social disabilities.	1155	569 (49.26 %)	311 (54.66 %)
7. Most studies indicate that about 5% of school-age students have dyslexia.	1141	563 (49.34 %)	265 (47.07 %)

21. People with dyslexia are not stupid or lazy. Knowing about the term helps children.	1116	541 (48.48 %)	310 (57.30 %)
25. I think dyslexia is a myth, a problem that does not exist.	1115	551 (49.42 %)	333 (60.44 %)
29. Dyslexia refers to a relatively chronic condition that is often not completely overcome.	1111	542 (48.78 %)	170 (31.37 %)
30. Many students with dyslexia continue to have reading problems as adults.	1103	543 (49.23 %)	262 (48.25%)
31. Many students with dyslexia have low self -esteem	1109	544 (49.05 %)	237(43.57 %)
Treatment			
10. Modeling fluent reading is often used as a teaching strategy.	1125	553 (49.16 %)	289 (52.26 %)
17. Children with dyslexia can be helped by using colored lenses/colored overlays.	1132	550 (48.59 %)	139 (25.27 %)
18. Physicians can prescribe medications to help students with dyslexia	1128	551 (48.85 %)	177 (32.12 %)
19. Multisensory instruction is not an effective training method at the moment.	1123	549 (48.89 %)	105 (19.13 %)
22. Giving students with dyslexia accommodations, such as extra time on tests, shorter spelling lists, special seating, etc., is unfair to other students.	1113	545 (48.97 %)	192 (35.23 %)
23. Intervention programs that emphasize the phonological aspects of language with the visual support of letters are effective for students with dyslexia.	1113	542 (48.70 %)	306 (56.46 %)
26. Repeated reading techniques are useful reading material to improve reading fluency.	1114	549 (49.28 %)	378 (68.85 %)
28. Students with dyslexia need structured, sequential, direct instruction in basic skills and learning strategies.	1106	545 (49.28 %)	287 (52.66 %)
Identification Process			
33. Applying an individual reading test is essential to diagnosing dyslexia.	1100	540 (49.09 %)	328 (60.74 %)

If we now turn to the responses of teachers who reported that they had had additional training on dyslexia, it becomes apparent that a general trend of their answers is similar to the answers of teachers who reported that they had covered dyslexia during their teacher education programme. As shown in Table 15, only a small number of teachers who indicated that they had had additional training on dyslexia showed a good awareness of dyslexia and provided correct answers. For example, only 124 teachers out of 275 who reported that they have had additional training on dyslexia knew that dyslexia results from a neurologically-based disorder. The data in Table 15 reveals that approximately more than half of the surveyed teachers who had had additional training on dyslexia were not well aware of this learning disorder. It is apparent from this data that only a small number of teachers provided correct answers to the questionnaire, and these results might suggest that the quality of additional training on dyslexia should be improved.

Table 15*Teachers' Knowledge of Dyslexia and Additional Training on Dyslexia*

Scale of Knowledge and Beliefs about Developmental Dyslexia	Total Number of Teachers (N)	Teachers who reported that they have had additional training on dyslexia. (N)	Correct answers of teachers who have had additional training on dyslexia. (N)
Neurological and Cognitive Characteristics			
1. Dyslexia is the result of a neurologically-based disorder.	1201	275 (22.90 %)	124 (45.09 %)
2. Dyslexia is caused by visual-perception deficits, producing the reversal of letters and words.	1153	267 (23.16 %)	65 (24.34 %)
5. The brains of individuals with dyslexia are different from those of people without dyslexia.	1151	261 (22.68 %)	107 (41 %)
6. Dyslexia is hereditary	1139	254 (22.30 %)	72 (28.35 %)
9. Children with dyslexia are more consistently impaired in phonemic awareness (i.e ability to hear and manipulate sounds in language) than any other ability.	1144	255 (22.29 %)	129 (50.59 %)

Behavioural Characteristics

11. People with dyslexia have below average intelligence	1139	255 (22.39 %)	113 (44.31 %)
12. The reading of students with dyslexia is often characterized by inaccuracy and lack of fluency.	1136	255 (22.45 %)	129 (50.59 %)
13. Seeing letters and words backwards is a basic characteristic of dyslexia.	1130	250 (22.12 %)	62 (24.8 %)
14. Difficulty with the phonological processing of information is one of the most important deficits in dyslexia.	1130	257 (22.74 %)	110 (42.80 %)
32. Children with dyslexia have problems with decoding and spelling but not with listening comprehension.	1098	239 (21.77 %)	118 (49.37 %)
34. Dyslexics tend to spell words wrong	1108	243 (21.93 %)	148 (60.91 %)
36. Dyslexia is characterized by difficulty with learning to read fluently	1105	239 (21.63 %)	142 (59.41 %)

General Knowledge

3. A child can be dyslexic and gifted	1176	270 (22.96 %)	173 (64.07 %)
4. Dyslexic children often have emotional and social disabilities.	1154	265 (22.96 %)	149 (56.23 %)
7. Most studies indicate that about 5% of school-age students have dyslexia.	1141	258 (22.61 %)	119 (46.12 %)
21. People with dyslexia are not stupid or lazy. Knowing about the term helps children.	1113	245 (22.01 %)	133 (54.29 %)
25. I think dyslexia is a myth, a problem that does not exist.	1114	250 (22.44 %)	128 (51.2 %)
29. Dyslexia refers to a relatively chronic condition that is often not completely overcome.	1111	245 (22.05 %)	78 (31.84 %)
30. Many students with dyslexia continue to have reading problems as adults.	1102	245 (22.23 %)	109 (44.49 %)
31. Many students with dyslexia have low self -esteem	1108	245 (22.11 %)	104 (42.45 %)

Treatment			
10. Modeling fluent reading is often used as a teaching strategy.	1123	252 (22.44 %)	142 (56.35 %)
17. Children with dyslexia can be helped by using colored lenses/colored overlays.	1129	248 (21.97 %)	66 (26.61 %)
18. Physicians can prescribe medications to help students with dyslexia	1126	248 (22.02 %)	71 (28.63 %)
19. Multisensory instruction is not an effective training method at the moment.	1120	247 (22.05 %)	44 (17.81 %)
22. Giving students with dyslexia accommodations, such as extra time on tests, shorter spelling lists, special seating, etc., is unfair to other students.	1111	247 (22.23 %)	74 (29.96 %)
23. Intervention programs that emphasize the phonological aspects of language with the visual support of letters are effective for students with dyslexia.	1110	250 (22.52 %)	127 (50.8 %)
26. Repeated reading techniques are useful reading material to improve reading fluency.	1113	250 (22.46 %)	163 (65.2 %)
28. Students with dyslexia need structured, sequential, direct instruction in basic skills and learning strategies.	1104	248 (22.46 %)	132 (53.23 %)
Identification Process			
33. Applying an individual reading test is essential to diagnosing dyslexia.	1099	238 (21.66 %)	138 (57.98 %)

To test Hypothesis 3 'Teachers who showed interest in further training on dyslexia have a better understanding of dyslexia', the third cross-tabulation analysis was performed, and a Z-test of proportions was run. A frequency distribution analysis showed that only 665 (49.26%) out of the 1350 surveyed teachers reported that they would like to participate in additional professional development courses on dyslexia while 208 (15.41%) respondents answered that they are not interested in further professional development on dyslexia, and 455 (35.33%) teachers indicated that

they do not know whether they want or do not want to participate in additional courses on dyslexia. The differences between the answers of teachers who showed interest in further professional development on dyslexia and teachers who were not interested in further training on dyslexia are highlighted in Table 16. The comparison of the results of these two groups reveals that there is no difference between their answers. Teachers who reported that they would like to participate in additional professional development courses on dyslexia showed the same results as those teachers who are not interested in additional professional development on dyslexia. Therefore, it might be concluded that the third hypothesis is not confirmed and teachers who are interested in further professional development on dyslexia do not have better knowledge of dyslexia than those teachers who are not interested in further training on dyslexia.

Table 16

Teachers' Knowledge of Dyslexia and their Interest in Further Training on Dyslexia

Scale of Knowledge and Beliefs about Developmental Dyslexia	Number of Teachers who Showed Interest in Further Professional Development on Dyslexia. (N)	Correct Answers of Teachers who Showed Interest in Further Professional Development on Dyslexia (N)	Number of Teachers who are not Interested in Further Training or do not know if they want to participate in Further Professional Development on Dyslexia. (N)	Correct Answers of Teachers who are not Interested in Further Training or do not know if they want to participate in Further Professional Development on Dyslexia. (N)	Difference between Proportions, Z-test
Neurological and Cognitive Characteristics					
1. Dyslexia is the result of a neurologically-based disorder.	590	309 (52.37 %)	609	282 (46.31 %)	p < .05
2. Dyslexia is caused by visual-perception deficits, producing the reversal of letters and words.	568	109 (19.19 %)	584	111 (19.01 %)	p > .05
5. The brains of individuals with	566	223 (39.40 %)	584	208 (35.62 %)	p > .05

dyslexia are different from those of people without dyslexia.					
6. Dyslexia is hereditary	566	142 (25.09 %)	573	111 (19.37 %)	p < .05
9. Children with dyslexia are more consistently impaired in phonemic awareness than any other ability	566	279 (49.29 %)	576	261 (45.31 %)	p > .05
Behavioural Characteristics					
11. People with dyslexia have below average intelligence	566	285 (50.35 %)	571	238 (41.68 %)	p < .05
12. The reading of students with dyslexia is often characterized by inaccuracy and lack of fluency.	559	287 (51.34 %)	576	293 (50.87 %)	p > .05
13. Seeing letters and words backwards is a basic characteristic of dyslexia.	557	126 (22.62 %)	571	123 (21.54 %)	p > .05
14. Difficulty with the phonological processing of information is one of the most important deficits in dyslexia.	559	261 (46.69 %)	571	219 (38.35 %)	p < .05
32. Children with dyslexia have problems with decoding and spelling but not with listening comprehension.	534	272 (50.94 %)	562	270 (48.04 %)	p > .05
34. Dyslexics tend to spell words wrong	540	339 (62.78 %)	565	332 (58.76 %)	p > .05
36. Dyslexia is characterized by	541	320 (59.15 %)	561	317 (56.51 %)	p > .05

difficulty with learning to read fluently					
General Knowledge					
3. A child can be dyslexic and gifted	581	398 (68.50 %)	594	334 (56.23 %)	p < .05
4. Dyslexic children often have emotional and social disabilities.	570	294 (51.58 %)	584	280 (47.95 %)	p > .05
7. Most studies indicate that about 5% of school-age students have dyslexia.	562	264 (46.98 %)	578	201 (34.78 %)	p < .05
21. People with dyslexia are not stupid or lazy. Knowing about the term helps children.	545	328 (60.18 %)	567	303 (53.44 %)	p < .05
25. I think dyslexia is a myth, a problem that does not exist.	553	330 (59.67 %)	558	299 (53.58 %)	p < .05
29. Dyslexia refers to a relatively chronic condition that is often not completely overcome.	545	147 (26.97 %)	563	141 (25.04 %)	p > .05
30. Many students with dyslexia continue to have reading problems as adults.	543	241 (44.38 %)	558	223 (39.96 %)	p > .05
31. Many students with dyslexia have low self-esteem	539	233 (43.23 %)	567	211 (37.21 %)	p < .05
Treatment					
10. Modeling fluent reading is	557	293 (52.60 %)	568	242 (42.61 %)	p < .05

often used as a teaching strategy.					
17. Children with dyslexia can be helped by using colored lenses/colored overlays.	555	149 (26.85 %)	573	114 (19.90 %)	p < .05
18. Physicians can prescribe medications to help students with dyslexia.	553	174 (31.46 %)	571	160 (28.02 %)	p > .05
19. Multisensory instruction is not an effective training method at the moment.	547	97 (17.73 %)	571	87 (15.24 %)	p > .05
22. Giving students with dyslexia accommodations, such as extra time on tests, shorter spelling lists, special seating, etc., is unfair to other students.	549	192 (34.97 %)	561	204 (36.36 %)	p > .05
23. Intervention programs that emphasize the phonological aspects of language with the visual support of letters are effective for students with dyslexia.	543	289 (53.22 %)	565	290 (51.33 %)	p > .05
26. Repeated reading techniques are useful reading material to improve reading fluency.	547	360 (65.81 %)	565	369 (65.31 %)	p > .05
28. Students with dyslexia need structured, sequential, direct instruction in basic skills and	543	275 (50.64 %)	561	270 (48.13 %)	p > .05

learning strategies.					
Identification Process					
33. Applying an individual reading test is essential to diagnosing dyslexia.	535	317 (59.25 %)	563	320 (56.84 %)	p >.05

4.4. Summary of Findings

This chapter has presented the findings obtained after the online survey administered on the Qualtrics platform. The data was analyzed within the IBM Statistical Package for the Social Sciences (SPSS) software. The survey results indicate that although some teachers demonstrated a good understanding of dyslexia, a significant proportion of teachers are not well aware of dyslexia. It should be highlighted that one-third of teachers reported they do not know the answer to almost all the items in the scale. The answer to the first question of the current research ‘What is the level of teachers’ knowledge of dyslexia in Akmola region of Kazakhstan?’ might be formulated as follows – the level of teachers’ knowledge of dyslexia across all its aspects is relatively low. Teachers are not well aware of the neurological and cognitive factors of dyslexia which confirms Hypothesis 1 of the current research. Turning to Hypothesis 2 of this paper, it might be concluded that the collected data proved the hypothesis since the survey results showed that teachers know the behavioural characteristics of dyslexia better than the neurological and cognitive factors. However, although teachers are more aware of the behavioural aspects of dyslexia, considerable knowledge gaps about the symptoms of dyslexia still exist among the surveyed teachers.

The results of this research showed that teachers’ training experiences do not have much influence on teachers’ understanding of dyslexia since only a minimum number of respondents from those who reported that they had pre-service or in-service training on dyslexia provided correct answers in the survey. Thus, in response to Question 2 of this research, it might be suggested that a weak relationship may exist between teachers’ knowledge about dyslexia and their pre-service or in-service training experiences.

As for the teachers' interest in further training on dyslexia, it was detected that there is no statistically significant difference in the proportion of correct answers between two groups of teachers, those who reported that they would like to participate in additional professional development courses on dyslexia and those who are not interested in further training on dyslexia. Since no statistically significant relationship between teachers' knowledge of dyslexia and their interest in further training was proven, Hypothesis 3 is rejected. The discussion of these findings will be presented in the next chapter.

Chapter 5: Discussion

The present research was designed to measure teachers' knowledge about dyslexia in mainstream schools in Akmola region in the North of Kazakhstan and to analyze if any relationship between teachers' knowledge of dyslexia and their training experiences exists.

The findings will be discussed with reference to the literature review and organized according to the following themes: teachers' general knowledge of dyslexia, teachers' knowledge across the neurological, cognitive and behavioural layers of dyslexia, teachers' knowledge about the treatment of dyslexia and its identification process and the relationship between teachers' knowledge of dyslexia and their training experiences.

5.1. Teachers' Knowledge of General Information about Dyslexia is Relatively Low

Many misconceptions and beliefs exist around the notion of dyslexia. Numerous researchers argue that a large proportion of students with dyslexia will not graduate school successfully nor continue their education in higher educational institutions since not all teachers are well aware of this condition (Price & Gerber, 2008). The present research found that nearly 57 % of the surveyed teachers in Akmola region know that dyslexia exists and it is not a myth. This result is encouraging as it shows that more than half of the surveyed teachers are aware of the existence of this learning disability. However, in other countries, the proportion of teachers who know that dyslexia is not a myth is much higher. For example, the research in Spain and Peru found that 85 % of respondents knew that dyslexia really exists (Soriano-Ferrer et al., 2016). A recent study conducted in China

also indicated that most Chinese teachers knew that dyslexia is a serious problem that might influence students' academic performance (Yin et al., 2019). Although 57 % of those surveyed in Akmola region knew that dyslexia is not a myth, unfortunately, almost 36 % of the surveyed teachers reported that they do not know if this learning disability is real or not. This result is disappointing as it demonstrates that more than one-third of teachers in Akmola region do not know about the existence of dyslexia, and consequently, are not well aware of how to handle dyslexia in the classroom and offer assistance in learning for children with this learning disability. This might have a negative impact on learners with dyslexia as educational scientists argue that the success of such children mainly depends on teachers' knowledge and awareness of dyslexia (Elliot & Grigorenko, 2014; Livingston, Siegel & Ribary, 2018; Riddick, 2010; Rose, 2009; Thomson, 2008).

Moreover, the current research found that 74 % of the surveyed teachers did not know that dyslexia is a chronic condition that cannot be completely overcome. These results mirror those observed in China (Yin et al., 2019), where researchers detected that more than 75 % of the surveyed teachers were not aware that dyslexia is a life-long condition. Unlike the results obtained in Kazakhstan and China, in Greece, the researchers found that more than 77 % of the respondents knew that dyslexia is a lifelong condition (Chourmouziadou, 2016). Similar findings were obtained by Wadlington and Wadlington (2005), who reported that most surveyed educators in the USA knew that dyslexia lasts a lifetime (Wadlington & Wadlington, 2005).

Regarding the intelligence of dyslexic people, the present research showed that almost 63 % of the surveyed teachers in Akmola region knew that children with dyslexia can be gifted, and nearly 47 % of those surveyed knew that people with dyslexia do not have below-average intelligence. These results are in agreement with Chourmouziadou's (2016) findings which showed that 53.9 % of the respondents in Greece knew that learning difficulties experienced by students with dyslexia are not related to low intelligence (Chourmouziadou, 2016). These findings are relatively modest compared with the USA results, where recent research indicated that 96 % of the

surveyed teachers in America (Wadlington & Wadlington, 2005) knew that people with dyslexia do not have below-average intelligence.

The findings discussed in this part of the chapter showed that a large proportion of the surveyed teachers in Akmola region do not know that dyslexia is a chronic condition and that this learning disability is not connected with intelligence. Moreover, the present research revealed that the percentage of the surveyed teachers who gave correct answers about the general characteristics of dyslexia are lower in comparison with such countries as Greece, Spain, Peru, the USA and China.

5.2. Teachers' Knowledge of the Neurological and Cognitive Nature of Dyslexia is Low

Regarding teachers' knowledge of the neurological and cognitive characteristics of dyslexia, the present findings are consistent with other research in the field, which found that teachers have a limited understanding of the neurological and cognitive origins of dyslexia. Surveys, such as those conducted by Bell et al. (2011) in England and Ireland, Knight (2016) in England and Wales and Yin et al. (2019) in China have shown that the surveyed teachers in their countries are not well aware of the neurological causes of dyslexia. These results agree with the present research findings, which indicated that more than 50% of 1216 surveyed teachers in mainstream schools in Akmola region did not know that dyslexia is a neurologically-based learning disability. One more important finding supporting the findings of the previous research (Chourmouziadou, 2016; Wadlington & Wadlington, 2005; Yin et al., 2019) is that a large proportion of the surveyed teachers did not know that dyslexia is hereditary. In the current research, almost 78 % of the surveyed teachers are not aware of the genetic basis of dyslexia which is much more than in other countries. For example, in the USA, the proportion of teachers who believe that dyslexia is not hereditary is 51.2 % (Wadlington & Wadlington, 2005); in China, the proportion varies from 36 to 54 % (Yin et al., 2019) and in Greece, the proportion of teachers who do not know that dyslexia can run in families is 45.6 % (Chourmouziadou, 2016). Such a large number of teachers in Akmola region who do not know about the genetic origin of dyslexia might imply serious problems for dyslexic learners in

Kazakhstan. Many scientists perceive hereditary factors as an additional predictor for identifying students at risk and providing them with extra assistance and support in learning (Carrol et al., 2014; Elliot & Grigorenko, 2014; Stein, 2008; Thomas, 2009). When teachers are not well aware of the genetic factors of dyslexia, they might not be able to recognize dyslexia in learners, and, consequently, it can result in the underestimation of dyslexia in the country and poor-quality education for children with this learning disability.

Thomson (2009) argues that deep knowledge of the neurological characteristics of dyslexia enables teachers to understand individual differences that children with dyslexia have and adjust teaching methods to meet such children's needs. The fact that a large proportion of the surveyed teachers in Akmola region of Kazakhstan do not know that dyslexia has a neurological origin suggests that learners with dyslexia in Kazakhstan do not have the required assistance and high-quality teaching in school.

A possible explanation for such a low awareness about dyslexia among Kazakhstani teachers may be the lack of adequate training on dyslexia for teachers during their pre-service and in-service education programmes. This suggestion is supported by the present research results, which revealed that 50.81 % of the surveyed teachers in Akmola region reported that they did not cover dyslexia during their pre-service teacher education programmes and 76.09% of those surveyed indicated that they did not have any additional training on dyslexia as in-service teachers. This finding is similar to the results presented by Knight (2018), who reported that 71.8% of teachers in England and Wales indicated that dyslexia was "not covered well at all" during their pre-service teacher training programme and also 50.4% of surveyed teachers reported that they did not have additional training on dyslexia.

Another important finding was that most of the surveyed teachers in Akmola region are not well aware of the cognitive factors of dyslexia. Almost 46 % of surveyed teachers reported that they do not know that phonological processing is one of the most influential factors that can cause this condition. Only 42 % of the current research respondents knew that phonological awareness is the

most important deficit in dyslexia. This finding is consistent with those of Chourmouziadou (2016), who found that only 44 % of surveyed teachers in Greece knew that phonological awareness deficit is the most agreed cause of dyslexia. Phonological awareness is critical in developing literacy; therefore, teachers' deep understanding of the difficulties which learners with dyslexia experience due to their condition can make their teaching practice more focused and productive for such children. Evidence shows that the environmental component positively impacts the development of reading skills and improvement of phonemic awareness (Castles & Coulthart, 2004; Elliot & Grigorenko, 2014; Thomson, 2009). Therefore, raising teachers' awareness of the phonological theory in Akmola region and Kazakhstan is vital for learners with dyslexia.

Based on the results obtained in this research, it can be concluded that the results of the present research confirm Hypothesis 1, which says that teachers' knowledge of the neurological and cognitive nature of dyslexia is low. Most educational scientists highlight that a thorough awareness of the neurological and cognitive causes of dyslexia is needed for teachers to organize an effective process of teaching and learning for students with dyslexia (Elliot & Grigorenko, 2014; Gyorfi & Smith, 2010; Riddick, 2010). Therefore, this finding has important implications both for higher education institutions that prepare future teachers and educational organizations which are involved in the professional development of in-service teachers as they need to strengthen their teacher training programmes by including recent and scientifically proven information about dyslexia into their courses.

5.3. Teachers' Knowledge of the Behavioural Factors of Dyslexia is Better than of the Neurological and Cognitive Characteristics

The current research results indicated that although teachers had some misunderstandings of the behavioural factors of dyslexia, they know the behavioural characteristics better than the neurological and cognitive ones. Research shows that one of the widely spread misconceptions about dyslexia is that one of the basic characteristics of dyslexia is seeing letters and words backwards (Chourmouziadou, 2016; Wadlington & Wadlington, 2005). In the current research,

almost 36 % of the surveyed teachers also believed that 'seeing letters and words backwards is a basic characteristic of dyslexia'. Moreover, nearly 43% of those surveyed in Akmola region reported that they do not know whether seeing letters and words backwards is the main symptom of dyslexia or not. Interestingly, these results differ from some published studies (Chourmouziadou, 2016; Wadlington & Wadlington, 2005; Yin et al., 2019). For example, research in the USA and China revealed that nearly 70% of the surveyed educators in both countries wrongly believed that word reversal is the main criterion to identify dyslexia (Wadlington & Wadlington, 2005; Yin et al., 2019). Research in Greece uncovered that 93 % of surveyed teachers thought that reversing letters and words is the main characteristic of dyslexia (Chourmouziadou, 2016). It is surprising that the proportion of surveyed teachers who believed that 'seeing letters and words backwards is a basic characteristic of dyslexia' in Akmola region is less than in other countries. However, it should be stressed that the percentage of teachers who do not know the answer to this question is 43% which is very high.

One of the main features that characterizes dyslexia is difficulties connected with learning to read fluently. In comparison with results obtained in China (Yin et al., 2019) and Greece (Chourmouziadou, 2016), where more than 90% of teachers knew that one of the main symptoms of dyslexia is a difficulty with learning to read fluently, only 57.81 % of the surveyed teachers in Akmola region could identify 'difficulties in learning to read fluently' as one of the basic features of dyslexia. Moreover, approximately 35 % of those surveyed did not know whether it is true or false. These results show that teachers in Kazakhstan know less about dyslexia than their counterparts in other countries such as Greece and China.

The frequency of correct teachers' answers about the neurological and cognitive characteristics of dyslexia and the behavioural characteristics of dyslexia demonstrated that teachers knew the behavioural characteristics of dyslexia better than the neurological and cognitive ones. The present findings are consistent with other research, which found that although teachers lack some knowledge of the behavioural factors of dyslexia, they still know the behavioural

characteristics better than the neurological and cognitive ones (Bell et al., 2011; Chourmouziadou, 2016; Gonzalez & Brown, 2019; Knight, 2018; Soriano-Ferrer et al., 2016; Wadlington & Wadlington, 2005; Yin et al., 2019). A possible explanation for these results may be that teachers can observe difficulties that learners with dyslexia experience in the classroom but do not know the real causes of these difficulties. The main value of the behavioural theory is that a deep understanding of the behavioural characteristics of dyslexia allows teachers to recognize the causes that lie behind the problems dyslexic learners encounter in learning and arrange an appropriate system of support and assistance for them (Elliot & Grigorenko, 2014; Thomson, 2009).

5.4. Teachers' Knowledge of Treatment and Identification Process of Dyslexia is not Sufficient

As mentioned in the literature review, early identification of dyslexia in children and timely intervention can allow students to adapt to the difficulties they experience and benefit from the process of learning and teaching (Elliot & Grigorenko, 2014; Livingston, Siegel & Ribary, 2018; Riddick, 2010; Rose, 2009; Thomson, 2008). The present research results indicated that almost 59 % of the surveyed teachers in Akmola region understand that individual reading tests are essential in identifying dyslexia. These results might be interpreted as encouraging as the majority of the surveyed teachers demonstrated knowledge of how they can identify dyslexia. However, a considerable proportion of the surveyed teachers (34.57%) reported that they do not know that an individual reading test is an effective instrument for identifying dyslexia. This result shows that more than one-third of the surveyed teachers in Akmola region do not know how to identify dyslexia. One of the issues that emerges from this finding is that teachers' limited knowledge about a 'reading test' as an identification instrument of dyslexia might lead to the underestimation of dyslexia among students in schools (Elliot & Grigorenko, 2014). Moreover, if teachers cannot recognize children at risk, they will not be able to provide them with appropriate and timely intervention (Rose, 2009).

Regarding the treatment of dyslexia, almost 53 % of the surveyed teachers in the present research knew that intervention programmes with a focus on the development of phonological

awareness are effective in teaching learners with dyslexia. This result supports previous research (Chourmouziadou, 2016), but the proportion of teachers (82 %) who knew that teaching phonological awareness is an effective tool in Greece is much more than in Akmola region.

Another important finding is that almost half of the surveyed teachers in the present research knew that providing learners with dyslexia with structured, sequential, direct instruction in basic skills and learning strategies is one of the most effective strategies. If the results obtained in China (Yin et al., 2019) are compared with the results gained in Akmola region, it can be seen that the proportion of teachers who knew that students with dyslexia need structured, sequential, direct instruction in basic reading skills was 72-90 % which is more than in Akmola region where only 49.64 % of the surveyed teachers knew about this fact. The proportion of teachers who do not know if physicians can prescribe medications to help learners with dyslexia in Akmola region (54.23 %) is almost consistent with the results (46-53%) obtained in China (Yin et al., 2019).

As was pointed out in the literature review, multisensory and phonologically based teaching is the prime approach in teaching children with dyslexia to read (Rose, 2009; Wadlington & Wadlington, 2005). Unfortunately, only 16.53 % of the surveyed teachers in Akmola region knew that multisensory instruction is one of the effective techniques to use with learners with dyslexia. These results mostly match those observed in Spain and Peru, where the researchers detected that more than 70 % of surveyed teachers in both countries were not aware of the effectiveness of multisensory instruction (Soriano-Ferrer et al., 2016).

The results obtained in the present research are not very encouraging as they demonstrate that although some teachers are aware of useful strategies to use with dyslexic learners, most surveyed teachers do not know how to work with children who experience difficulties related to dyslexia. Moreover, comparing the results from other countries, we can see that teachers in Akmola region know less than their colleagues in other countries. These results are significant in at least one respect: they show that the preparation of teachers to work with dyslexic learners is not adequate,

and there is a high need for quality training on dyslexia for teachers in Akmola region and likely in the whole of Kazakhstan as the country has a uniform teacher training approach.

5.5. There is no Strong Relationship between Teachers' Knowledge of Dyslexia and their Training Experiences

The present research showed no strong relationship between teachers' knowledge about dyslexia and their training experiences, including pre-service teacher education programmes and additional in-service training. In this study on Akmola region in Kazakhstan, only a small number of teachers from the group of teachers who reported that they had covered dyslexia during their teacher education programme were well aware of this learning disability. Similarly, teachers who reported that they had additional training on dyslexia mainly demonstrated a limited knowledge about dyslexia. It can be suggested that a possible explanation for these results may be that teacher training programmes lack evidence-based information about dyslexia and do not provide student teachers with up-to-date academic knowledge about all aspects of dyslexia.

The teachers who indicated that they would like to participate in additional professional development courses on dyslexia did not show better results than those teachers who were not interested in further training on dyslexia. In comparison, the results obtained by Wadlington and Wadlington (2005) showed that those respondents who expressed an interest in getting more training on dyslexia had substantially better results than those who were not interested in further professional development on dyslexia. This difference can be explained in part by the low quality of training Kazakhstani teachers have received and the overall awareness about dyslexia in society.

The present research findings revealed that teachers in Akmola region of Northern Kazakhstan have limited knowledge about dyslexia across three layers: neurological, cognitive and behavioural. Educational scientists highlight that the lack of teachers' knowledge about dyslexia influences teaching efficacy (Elliot & Grigorenko, 2014; Knight, 2018; Riddick, 2010; Rose, 2009; Thomson, 2009). If teachers are not well aware of dyslexia and its characteristics, they will not be able to identify learners with dyslexia and provide such learners with timely and effective support.

Evidence shows that early interventions have better chances to prevent dyslexia or help dyslexic children to adapt to this condition (Elliot & Grigorenko, 2014; Thomson, 2009). Therefore, it is apparent that the more teachers know about dyslexia, the more chances learners with dyslexia will have to cope with this learning barrier. The current research findings raise crucial questions regarding the quality of teacher education programmes on dyslexia and suggest that existing teacher training programmes on dyslexia in Kazakhstan are insufficient and should be reconsidered.

Chapter 6: Conclusion

6.1. What do Teachers in Akmola Region Know about Dyslexia? Answers to the Research

Questions and Hypotheses

The present research aimed to examine teachers' knowledge about dyslexia in mainstream schools in Akmola region of Northern Kazakhstan and to analyze whether there is any relationship between teachers' understanding of dyslexia and their training experiences. To achieve this aim, an online survey was conducted. Overall, 1435 mainstream school teachers participated in the survey.

The first question in this research sought to measure teachers' knowledge about dyslexia in public schools in Akmola region of Northern Kazakhstan. The answer to this question was obtained by frequency distribution analysis which revealed that teachers' knowledge about dyslexia in Akmola region is insufficient and relatively modest compared to other countries. The investigation of teachers' knowledge has shown that teachers are not well aware of general information about dyslexia and have limited awareness of the neurological and cognitive characteristics of this learning disorder. These results confirmed the first hypothesis of the present research, which states that teachers' understanding of the neurological and cognitive causes of dyslexia is low. One of the more significant findings to emerge from this research is that a large proportion of teachers do not know what effective strategies can be used in teaching learners with dyslexia. These results might suggest that the needs of students with dyslexia are not met successfully in mainstream schools in Akmola region, and that these children have fewer opportunities to succeed in school and life.

Another significant finding of this research is that more than half of surveyed teachers reported that they did not study dyslexia during their initial teacher education programmes, and more than three-quarters of those surveyed had not received any additional training on dyslexia. Therefore, teachers should not be blamed for their low level of knowledge about dyslexia, but the results do suggest that more training opportunities are needed for teachers in this area.

The second question of this research was to explore the relationship between teachers' understanding of dyslexia and their pre-service and in-service teacher training experiences. The research results have shown no association between teachers training experiences and their knowledge about dyslexia. Most teachers who reported that they covered dyslexia within their in-service teacher education programme or had extra training on dyslexia as in-service teachers had a limited understanding of dyslexia. It seems possible that these results are due to the insufficient quality of training programmes on dyslexia for teachers, which highlights a high need for reconsidering teacher education programmes in regards to dyslexia.

The second hypothesis posed in this research was that teachers know the behavioural characteristics of dyslexia better than the neurological and cognitive ones. The results of this investigation showed that although teachers misunderstood some of the behavioural factors of dyslexia, in general, they knew the behavioural characteristics better than the neurological and cognitive ones. Frequency distribution analysis showed that the number of teachers who responded correctly to the questions that estimated their knowledge of the behavioural aspect of dyslexia was higher than the number of teachers who gave correct answers to the questions measuring the knowledge of the neurological and cognitive origins of dyslexia. This result implies that teachers might observe the difficulties that learners with dyslexia experience in the classroom, but they are not aware of the causes of these difficulties.

Finally, this research hypothesized that teachers who showed interest in further training on dyslexia have a better understanding of this condition. The evidence obtained in this research demonstrated that teachers who reported that they would like to participate in additional

professional development courses on dyslexia are not better aware of dyslexia than those teachers who were not interested in additional professional development on dyslexia. Therefore, it might be concluded that the third hypothesis is not confirmed and the findings in this research are not in line with what was observed in other countries.

6.2. Implications and Recommendations Based on Obtained Data for Practice and Policy

Taken together, the present research findings revealed that teachers' knowledge about dyslexia across all three layers (neurological, cognitive and behavioural) is relatively low in Akmola region of Northern Kazakhstan. Most teachers did not know about the neurological and cognitive causes that lie behind dyslexia and were not well aware of effective strategies and techniques to work with dyslexic learners. The research detected that even teachers who indicated that they had training on dyslexia as in-service and pre-service teachers did not have a good understanding of this learning disability. A possible explanation for these results might be that dyslexia is not well covered during pre-service and in-service teacher training programmes. Therefore, it seems fair to suggest that to ensure that teachers have adequate knowledge of how to effectively organize the teaching process for learners with dyslexia, evidence-based information about dyslexia should be included in teacher education programmes in higher education institutions. If teachers have an opportunity to develop a deeper understanding of the neurological, cognitive and behavioural aspects of dyslexia, they will be better equipped to meet the educational needs of students with this learning disability. In that case, children with dyslexia will be able to adapt to any difficulties they experience and to reach their true potential.

Moreover, extra-training on dyslexia should be organized for in-service teachers to raise their awareness of recent and up-to-date investigations about dyslexia. Chourmouziadou (2016), Knight (2018), Wadlington and Wadlington (2005) and Yin et al. (2019) arrived at the same conclusion in the context of the countries they studied and they further stress that quality training on dyslexia should be provided for teachers to equip them with up-to-date knowledge about dyslexia. Knight (2018) has highlighted that this training should be organized regularly during a teacher's

career to guarantee that teachers are provided with the most recent information about this learning disorder. Therefore, Kazakhstan has a definite need to include dyslexia in teacher education programmes and to organize additional professional development courses on dyslexia for pre-service and in-service teachers.

6.3. Limitations and Further Research

Several limitations to the present research need to be acknowledged. First, to obtain the information for this research, only a quantitative research approach was employed. For further research, it might be more informative to conduct mixed methods research including qualitative and quantitative methods. The use of quantitative and qualitative methods provides a researcher with a deeper understanding of the researched problem. For example, interviews might have given more insights into obtained survey data of the current work. Second, although the scale chosen for the present research is of high quality and strong validity, the response options such as 'True', 'False' or 'I don't know' did not allow to employ a wider range of statistical tests. Further research could employ a different measurement scale allowing for more versatile quantitative data analysis.

Another limitation of this research was that a link to the survey was distributed to schools by managers of the district departments of the Department of Education of Akmola region. One of the district managers sent the link to the survey, not to one of the district schools as was planned, but to all schools in the district. Therefore, instead of 63 teachers of one school responding to the survey, 185 teachers completed the questionnaire in this district. Yet, the data analysis did not indicate any systematic bias in the data due to this deviation in sampling.

This is the first research investigating teachers' knowledge about dyslexia in Kazakhstan and it focuses on one of the regions in the country. More research on dyslexia needs to be conducted in Kazakhstan to better understand what teachers in other regions of Kazakhstan know about dyslexia and to what extent teachers' knowledge and understanding of dyslexia influence their teaching practices.

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Appendices**Appendix A****Nazarbayev University****M.Sc. in Educational Leadership: Inclusive Education****INFORMED CONSENT FORM****Teachers' Knowledge of Dyslexia in Akmola region of Kazakhstan**

You are invited to participate in a research study "Teachers' Knowledge of Dyslexia in Akmola region". The topic of dyslexia has practically not been studied in Kazakhstan. The information you provide in this study will be of great value and importance for improving the current teacher education system and the entire system of inclusive education as a whole in Kazakhstan. Your participation in this study will make an invaluable contribution to the research of this topic! The purpose of this study is to measure the level of teachers' knowledge of dyslexia in the mainstream schools of Akmola region and to analyze if there any relationship between teachers' knowledge of dyslexia and their training experiences exists.

This survey will take approximately 10 minutes to complete 47 questions (11 demographic questions and 36 one-sentence factual statements about dyslexia). If you feel uncomfortable to answer any question included in this survey, you may skip it and respond to the next questions. This survey is on an anonymized link and, therefore, no personal identifying information is requested. If you have read this information and have decided to participate in this research, please understand your participation is voluntary and you have the right to withdraw your consent or discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled. You have the right to refuse to answer specific questions. The results of this research study may be presented at scientific or professional meetings or published in scientific journals.

Contact Information:

If you have any questions, concerns or complaints about this research, its procedures, risks and benefits, contact the Master's Thesis Supervisor for this student work, (Rita Kasa, rita.kasa@nu.edu.kz). If you have any other questions or concerns or if you are not satisfied with how the research was conducted, you may contact NUGSE Research Committee at gse_researchcommittee@nu.edu.kz

Statement of Consent

By clicking "I agree" below you are indicating that you are more than 18 years old, have read and understood this consent form and agree to participate in this research study:

I agree

I disagree

DATA COLLECTION INSTRUMENT (Survey)**Survey Questions (English)****Section 1****Demographic Questions**

1. What is your age?
 - 25 years or below
 - 26-35 years
 - 36-45 years
 - 46 years or above
2. Indicate your gender
 - Male
 - Female
3. Your highest level of education completed is:
 - Bachelor Degree
 - Specialist Degree
 - Master Degree
 - Doctoral Degree (Doctor of Science or Ph.D)
 - Other, please specify _____
4. How many years have you been teaching at this school?
 - 0-2 years
 - 3-5 years
 - 6-10 years
 - 11-15 years
 - 16-20 years
 - 21+ years
5. How many years have you been teaching at school in total?
 - 0-2 years
 - 3-5 years
 - 6-10 years
 - 11-15 years
 - 16-20 years
 - 21+ years
6. What grade level do you teach? *Several options can be chosen*
 - Primary school
 - Secondary school
 - High school
7. What subject do you teach?
 - Primary school
 - Kazakh language and literature
 - Russian language and literature
 - Mathematics (algebra, geometry)
 - ICT
 - Physics
 - Chemistry
 - Biology
 - History (History of Kazakhstan, World History)
 - Geography
 - Foreign language (English, German, French, etc.)
 - Physical Education

- Art
 - Self-knowledge
 - Technology / Handicraft (craft)
 - Natural science
 - Military training
 - Other _____
8. Which city is your school in?
- Arshalynsky district
 - Atbasar district
 - Birzhan Sal district
 - Burabai district
 - Bulandy district
 - Egendykolsky district
 - Esilsky district
 - Kokshetau
 - Korgalzhinsky district
 - Sandyktau district
 - Tselinogradsky district
 - Zhaksynsky district
 - Zharkayinsky district
 - Zerenda
9. Have you covered dyslexia during your pre-service teacher education programme?
- None
 - Some
 - High
10. Have you had additional training on dyslexia?
- Yes, I have had
 - No, I haven't had
11. Would you like to participate in additional professional development courses on dyslexia?
- Yes
 - No
 - I don't know

Section 2

The following questions ask about dyslexia. Please tick the response which best applies to you.

#	Questions	True	False	I don't know
1	Dyslexia is the result of a neurologically-based disorder.			
2	Dyslexia is caused by visual-perception deficits, producing the reversal of letters and words.			
3	A child can be dyslexic and gifted.			
4	Dyslexic children often have emotional and social disabilities.			
5	The brains of individuals with dyslexia are different from those of people without dyslexia.			
6	Dyslexia is hereditary.			

7	Most studies indicate that about 5% of school-age students have dyslexia.			
8	Dyslexia has a greater occurrence in males than in females.			
9	Children with dyslexia are more consistently impaired in phonemic awareness (i.e ability to hear and manipulate sounds in language) than any other ability.			
10	Modeling fluent reading is often used as a teaching strategy.			
11	People with dyslexia have below average intelligence.			
12	The reading of students with dyslexia is often characterized by inaccuracy and lack of fluency.			
13	Seeing letters and words backwards is a basic characteristic of dyslexia.			
14	Difficulty with the phonological processing of information is one of the most important deficits in dyslexia.			
15	Intelligence tests are useful in identifying dyslexia.			
16	All poor readers have dyslexia.			
17	Children with dyslexia can be helped by using colored lenses/colored overlays.			
18	Physicians can prescribe medications to help students with dyslexia.			
19	Multisensory instruction is not an effective training method at the moment. (Multisensory instruction is a way of teaching that engages more than one sense at a time. Using sight, hearing, movement, and touch gives kids more than one way to connect with what they are learning.)			
20	Students who have reading disabilities without an apparent cause are called dyslexic.			
21	People with dyslexia are not stupid or lazy. Knowing about the term helps children.			
22	Giving students with dyslexia accommodations, such as extra time on tests, shorter spelling lists, special seating, etc., is unfair to other students.			
23	Intervention programs that emphasize the phonological aspects of language with the visual support of letters are effective for students with dyslexia.			
24	Most teachers receive intensive training in working with dyslexic children.			

25	I think dyslexia is a myth, a problem that does not exist.			
26	Repeated reading techniques are useful reading material to improve reading fluency.			
27	Problems in establishing laterality (body schema) are the cause of dyslexia.			
28	Students with dyslexia need structured, sequential, direct instruction in basic skills and learning strategies.			
29	Dyslexia refers to a relatively chronic condition that is often not completely overcome.			
30	Many students with dyslexia continue to have reading problems as adults.			
31	Many students with dyslexia have low self-esteem.			
32	Children with dyslexia have problems with decoding and spelling but not with listening comprehension.			
33	Applying an individual reading test is essential to diagnosing dyslexia.			
34	Dyslexics tend to spell words wrong.			
35	Dyslexia usually lasts for a long time.			
36	Dyslexia is characterized by difficulty with learning to read fluently.			

Thank you for the participation!

Appendix B**Nazarbayev University****АҚПАРАТТАНДЫРЫЛҒАН КЕЛІСІМ НЫСАНЫ (Сауалнама)****Ақмола облысы мұғалімдерінің «Дислексия» туралы білім деңгейін зерттеу**

Сіздерді «Ақмола облысы мұғалімдерінің «Дислексия» туралы білім деңгейін зерттеу» атты ғылыми-зерттеуге қатысуға шақырамыз. Дислексия тақырыбы Қазақстанда іс жүзінде зерттелмеген, бұл тақырып бойынша әдебиет пен ғылыми зерттеулердің жеткіліксіздігі білім беру жүйесін тиімді дамытуға мүмкіндік бермейді. Аталмыш зерттеу аясында сіз ұсынатын ақпарат білім беру жүйесін жақсарту және болашақ мұғалімдерді тиімді даярлау үшін өте маңызды әрі құнды болып табылады. Сіздің осы зерттеуге қатысуыңыз бұл тақырыпты зерттеуге баға жетпес үлес қосады!

Осы зерттеудің мақсаты Ақмола облысы жалпы білім беретін мектеп мұғалімдерінің дислексия туралы білім деңгейін анықтау және мұғалімдердің дислексия туралы білімі мен олардың оқыту тәжірибесі арасындағы қандай да бір байланыстың болуына талдау жасау болып табылады.

Бұл сауалнама 47 сұраққа жауап беру үшін шамамен 10 минутты алады (11 демографиялық сұрақ және KBDDS шкаласына негізделген "Дислексия" тақырыбы бойынша 36 сұрақ). Егер сіз осы сауалнаманың белгілі бір сұрағына жауап бергіңіз келмесе, оны өткізіп жіберіп, келесі сұраққа өтуіңізге болады.

Бұл зерттеуге қатысудың ықтимал қаупі – сіз жұмыс уақытыңызды сауалнамадан өтуге жұмсауыңыз мүмкін. Бұл мәселені болдырмау үшін сауалнаманы бос уақытыңызда толтыруды ұсынамыз. Сіздің толық аты-жөніңіз және телефон нөмірі мен тұрғылықты мекен-жайы сияқты басқа да сәйкестендіретін ақпарат сауалнамаға кірмейді, сондықтан сіз берген кез-келген ақпаратқа сіздің байланысыңыз болмайды.

Осы зерттеуден күтуге болатын артықшылық – бұл зерттеудің нәтижелері жоғары оқу орындарында мұғалімдерді даярлаумен айналысатын жаңа бағдарламалар жасау үшін пайдаланылуы мүмкін. Дислексия тақырыбын зерттейтін оқытушылар мен ғалымдар болашақ зерттеулер үшін маңызды және пайдалы нәтижелер мен қорытындыларды таба алады.

Егер сіз осы форманы оқып, зерттеуге қатысуға шешім қабылдаған болсаңыз, онда сіздің қатысуыңыз ерікті екенін және кез-келген уақытта айыппұлсыз және сізге берілген жеңілдіктер пакетін жоғалтпай келісіміңізді қайтарып алу немесе қатысуды тоқтату құқығыңыз бар екенің түсінуіңіз керек. Балама таңдау жасап зерттеуге қатыспауға болады. Сонымен қатар, сіздің кез-келген сұраққа жауап бермеуге құқығыңыз бар. Осы зерттеудің нәтижелері ғылыми немесе кәсіби мақсаттарда ұсынылуы немесе жариялануы мүмкін.

Байланыс деректері

Егер сізде осы зерттеуге, оның жүзеге асу жолдарына, қауіптері мен артықшылықтарына қатысты сұрақтарыңыз, алаңдаушылықтарыңыз немесе шағымдарыңыз болса, осы ғылыми зерттеу жұмысы бойынша магистрлік диссертацияның жетекшісіне хабарласыңыз (Рита Каса, rita.kasa@nu.edu.kz). Егер сізде басқа да сұрақтар немесе алаңдаушылықтар болса немесе зерттеудің жүргізілуіне қанағаттанбасаңыз, NUGSE зерттеу комитетімен келесі мекенжай бойынша байланыса аласыз gse_researchcommittee@nu.edu.kz

Келісім туралы өтініш

Төмендегі "Мен келісемін" батырмасын басу арқылы сіз 18 жастан асқаныңызды көрсетесіз, сондай-ақ, сіз осы Келісім нысанымен танысып және осы зерттеуге қатысуға келісім бересіз:

Мен келісемін

Мен келіспеймін

САУАЛНАМА (Kazakh)**1-бөлім**

1. Сіздің жасыңыз нешеде?

- 25 жас немесе одан төмен
- 26-35 жас
- 36-45 жас
- 46 жас немесе одан жоғары

2. Жынысыңызды көрсетіңіз:

- Ер
- Әйел

3. Сіздің білім деңгейіңіз:

- Бакалавр
- Маман
- Магистр дәрежесі
- Докторлық дәреже (Ғылым докторы немесе Ph.D)
- Басқа _____

4. Осы мектепте неше жылдан бері сабақ бересіз?

- 0-2 жыл
- 3-5 жыл
- 6-10 жыл
- 11-15 жыл
- 16-20 жыл
- 21 жыл және одан жоғары

5. Жалпы алғанда қанша жыл сабақ беріп келесіз?

- 0-2 жыл
- 3-5 жыл

- 6-10 жыл
 - 11-15 жыл
 - 16-20 жыл
 - 21 жыл және одан жоғары
6. Қандай сынып буындарында сабақ бересіз? *Бірнеше жауап нұсқасын таңдауға болады*
- Бастауыш сынып
 - Орта буын
 - Жоғарғы буын
7. Оқытатын пәніңізді көрсетуіңізді сұраймын:
- Бастауыш сыныптағы барлық пән / Бастауыш сыныптар
 - Қазақ тілі және әдебиеті
 - Орыс тілі және әдебиеті
 - Математика (алгебра, геометрия)
 - Информатика
 - Физика
 - Химия
 - Биология
 - Тарих (Қазақстан тарихы, Дүниежүзі тарихы)
 - География
 - Шет тілі (ағылшын тілі, неміс тілі, француз тілі және т.б.)
 - Дене шынықтыру
 - Мәдениет
 - Өзін-өзі тану
 - Еңбекке баулу (Технология)
 - Жаратылыстану
 - Алғашқы Әскери Оқыту
 - Басқа _____
8. Сіздің мектебіңіз қай жерде орналасқан?
- Аршалы ауданы
 - Атбасар ауданы
 - Біржан сал ауданы
 - Бурабай ауданы
 - Бұланды ауданы
 - Егіндікөл ауданы
 - Есіл ауданы
 - Көкшетау қаласы
 - Қорғалжын ауданы
 - Сандықтау ауданы
 - Целиноград ауданы
 - Жақсы ауданы
 - Жарқайың ауданы
 - Зеренді ауданы
9. Сіз педагогикалық білім алған жоғары оқу орындарында немесе колледжде дислексия тақырыбын оқыдыңыз ба?
- Жоқ
 - Аздап

- Ия, толығымен

10. Сіз дислексия бойынша біліктілікті арттыру курстарынан өттіңіз бе (коучингтер, семинарлар, онлайн-курстар)?

- Ия
- Жоқ

11. Дислексия бойынша біліктілікті арттыру курстарын (коучингтер, семинарлар, онлайн-курстар) өткіңіз келеді ме?

- Ия
- Жоқ
- Білмеймін

2-бөлім

Сіздің ойыңызға сәйкес келетін жауапты таңдауыңызды сұраймын:

#	Сұрақтар	Ия	Жоқ	Білмеймін
1	Дислексия неврологиялық бұзылыстың нәтижесі.			
2	Дислексия әріптер мен сөздердің ауысуына әкелетін визуалды қабылдаудың жетіспеушілігінен туындайды.			
3	Балада дислексия да, дарындылық та болуы мүмкін.			
4	Дислексиясы бар балаларда эмоционалды және әлеуметтік мәселелер жиі туындайды.			
5	Дислексиясы бар адамдардың миы дислексиясы жоқ адамдардан өзгеше.			
6	Дислексия тұқым қуалайды.			
7	Көптеген зерттеулер көрсеткендей, мектеп жасындағы оқушылардың шамамен 5% -інде дислексия бар.			
8	Дислексия әйел адамдарға қарағанда ерлерде жиі кездеседі.			
9	Дислексиясы бар балаларда фонематикалық қабылдау (яғни, тілдегі дыбыстарды есту қабілеті және қолмен қимылдар жасау қабілеті) басқа балаларға қарағанда жиі бұзылады.			
10	Мүдірмей тез оқуды модельдеу көбінесе оқыту стратегиясы ретінде қолданылады.			
11	Дислексиясы бар адамдардың ақылы (интеллект) орташадан төмен.			
12	Дислексиясы бар оқушылардың оқу дағдылары көбінесе дәлсіздікпен және жылдамдықтың жоқтығымен сипатталады.			

13	Әріптер мен сөздерді арттан алдына қарай көру – дислексияның негізгі сипаттамасы.			
14	Ақпаратты фонологиялық өңдеудегі қиындықтар – дислексияның негізгі кемшіліктерінің бірі.			
15	Зият (интеллект) деңгейін анықтайтын тестілер дислексияны анықтау үшін пайдалы.			
16	Оқу дағдысында қиындығы бар оқушылардың барлығында дислексия бар.			
17	Дислексиясы бар балаларға түрлі түсті линзаларды немесе қаптамаларды қолдану арқылы көмектесуге болады.			
18	Дәрігерлер дислексиясы бар оқушыларға дәрі-дәрмек тағайындай алады.			
19	Мультисенсорлы оқыту қазіргі кезде оқытудың тиімді әдісі болып табылмайды.			
20	Оқу дағдысында айқын себепсіз қиындығы бар оқушылар дислексикасы бар болып табылады.			
21	Дислексиясы бар адамдар ақымақ немесе жалқау емес. «Дислексия» термині оқушыларды өзін ақымақ емес екенін сезінуге көмектеседі.			
22	Дислексиясы бар оқушыларға қосымша жағдай жасау, мысалы, тестілер өтуге қосымша уақыт, салыстырмалы түрде қысқа жазбаша тапсырмалар, сыныптағы арнайы орындарды және т.б. беру, басқа оқушыларға әділетсіз қарым-қатынас болып табылады.			
23	Әріптерді визуалды қолдай отырып, тілдің фонологиялық аспектілеріне бағытталған арнайы бағдарламалар дислексиясы бар оқушылар үшін тиімді.			
24	Мұғалімдердің көпшілігі дислексиясы бар балалармен жұмыс жасау бойынша қарқынды дайындықтан өтеді.			
25	Менің ойымша, дислексия – бұл аңыз, ол нақты мәселе емес.			
26	Қайталап оқу техникасы еркін оқуды жақсарту үшін пайдалы стратегия болып табылады.			
27	Дене сұлбасын анықтаудағы қиындықтар дислексияның себебі болып табылады.			
28	Дислексиясы бар оқушыларға негізгі дағдылар мен оқыту стратегиялары бойынша құрылымдық, жүйелі және тікелей нұсқаулық қажет.			

29	Дислексия – созылмалы ауру, көп жағдайда ол есейе келе кетпейді.			
30	Дислексиясы бар оқушылардың көпшілігінде ересек кезінде оқу қиындықтары болады.			
31	Дислексиясы бар оқушылардың көпшілігінің өзіне деген сенімділігі төмен.			
32	Дислексиясы бар балалар тыңдап түсінуге қарағанда сөзді әріптеп айтуда және мағынасын ашуда қиындықтарға тап болады.			
33	Оқуға бағытталған жеке тестіні қолдану дислексияны диагностикалау үшін өте маңызды.			
34	Дислексиясы бар оқушылар орфографиялық қателерді жиі жібереді.			
35	Дислексия, әдетте, ұзақ уақытқа созылады.			
36	Дислексия еркін оқуды үйренудегі қиындықтармен сипатталады.			

Сауалнамаға қатысқаныңыз үшін рақмет!

Appendix C

Назарбаев Университет

Высшая Школа Образования

Программа Магистратуры в Области Управления Образованием: Инклюзивное Образование

Форма Согласия

Исследования уровня знаний учителей по теме «Дислексия» в общеобразовательных школах Акмолинской области

Приглашаем Вас принять участие в научном исследовании по теме “Изучение знаний учителей общеобразовательных школ Акмолинской области о дислексии”. Информация, предоставленная Вами в рамках данного исследования, будет иметь огромную ценность и важность для улучшения системы образования в целом и для более успешной и эффективной подготовки будущих учителей в Казахстане. Ваше участие в данном исследовании внесет неоценимый вклад в изучении этой темы!

Целью данного исследования является изучение уровня знаний о дислексии среди учителей общеобразовательных школ Акмолинской области.

Данный опрос займет около 10 минут, чтобы ответить на 47 вопросов (11 демографических вопросов и 36 вопросов по теме «Дислексия» по шкале KBDDS. Если Вы не желаете отвечать на какой-либо вопрос данного опроса, Вы можете пропустить его и перейти к следующему вопросу.

Данный опрос является анонимным, Ваше имя, фамилия и другая идентифицирующая Вас информация, такая, как номер телефона и адрес проживания не будут включены в опрос, поэтому Вы не будете связаны с информацией, которую Вы предоставляете.

Если Вы прочитали данную информацию и решили принять участие в исследовании, Вы должны понимать, что Ваше участие является добровольным и что у Вас есть право отозвать свое согласие или прекратить участие в любое время без штрафных санкций и без потери социального пакета, который Вам предоставляли. В качестве альтернативы можно не участвовать в исследовании. Также Вы имеете право не отвечать на какие-либо вопросы.

Если у вас есть какие-либо вопросы, опасения или жалобы по поводу этого исследования, его процедур, рисков и преимуществ, свяжитесь с руководителем данной исследовательской работы (Рита Каса, rta.kasa@nu.edu.kz). Если у вас есть другие вопросы или опасения, или если вы не удовлетворены тем, как было проведено исследование, вы можете связаться с исследовательским комитетом NUGSE по адресу gse_researchcommittee@nu.edu.kz

Нажав кнопку “Я согласен” ниже, вы указываете, что вам больше 18 лет, Вы ознакомились с данной формой согласия и согласны участвовать в этом исследовании:

Да, Я согласен

Нет, Я не согласен

ОПРОС (Russian)

Часть I

1. Сколько Вам лет?

- 25 лет или менее
- 26-35 лет
- 36-45 лет
- 46 лет или более

2. Укажите Ваш пол

- Мужской
- Женский

3. Уровень Вашего образования:

- Бакалавр
- Специалист
- Степень магистра
- Докторская степень (степень доктора наук)
- Другое _____

4. Сколько лет Вы преподаете в этой школе?

- 0-2 года
- 3-5 лет
- 6-10 лет
- 11-15 лет
- 16-20 лет
- 21 и более лет

5. Сколько лет Вы преподаете в общей сложности?

- 0-2 года
- 3-5 лет
- 6-10 лет
- 11-15 лет
- 16-20 лет
- 21 и более лет

6. В какой параллели Вы работаете? *Можно указать несколько ответов*

- Начальное звено
- Среднее звено
- Старшее звено

7. Укажите, пожалуйста, предмет, который Вы преподаёте?

- все предметы в начальных классах/ начальные классы

- Казахский язык и литература
 - Русский язык и литература
 - Математика (алгебра, геометрия)
 - Информатика
 - Физика
 - Химия
 - Биология
 - История (История Казахстана, Всемирная история)
 - География
 - Иностранный язык (английский язык, немецкий язык, французский язык итд)
 - Физическая культура
 - Искусство
 - Самопознание
 - Трудовое Обучение (Технология)
 - Естествознание
 - НВП
 - Другое _____
8. В каком городе/районе находится школа, в которой Вы работаете?
- Аршалынский район
 - Атбасарский район
 - район Биржан сал
 - Бурабайский район
 - Буландынский район
 - Егендыкольский район
 - Есильский район
 - Кокшетау
 - Коргалжинский район
 - Сандыктауский район
 - Целиноградский район
 - Жаксынский район
 - Жаркаинский район
 - Зеренда
9. Вы изучали тему дислексии в университете, институте или колледже, где Вы получали педагогическое образование?
- Нет
 - Немного
 - Да, в полной мере
10. Проходили ли Вы дополнительные курсы профессионального развития по теме дислексии (коучинги, семинары, онлайн курсы)?
- Да
 - Нет
11. Хотели бы Вы пройти дополнительные курсы профессионального развития по теме дислексии (коучинги, семинары, онлайн курсы)?
- Да
 - Нет
 - Не знаю

Часть II

Пожалуйста, выберите наиболее подходящий Вам ответ:

#	Вопросы	Да	Нет	Не знаю
1	Дислексия это результат неврологического расстройства.			
2	Дислексия вызвана дефицитом зрительного восприятия, приводящим к переворачиванию букв и слов.			
3	Ребенок может иметь дислексию и быть одаренным.			
4	Дети с дислексией часто имеют эмоциональные и социальные проблемы.			
5	Мозг людей с дислексией отличается от мозга людей без дислексии.			
6	Дислексия передается по наследству.			
7	Большинство исследований показывают, что около 5% учеников школьного возраста страдают дислексией.			
8	Дислексия чаще встречается у мужчин, чем у женщин.			
9	У детей с дислексией фонематическое восприятие (то есть способность воспринимать и различать звуки речи) нарушается чаще, чем у других детей.			
10	Моделирование беглого чтения часто используется в качестве стратегии обучения.			
11	Люди с дислексией имеют интеллект ниже среднего.			
12	Навык чтения у учащихся с дислексией часто характеризуется неточностью и отсутствием беглости.			
13	Видеть буквы и слова задом наперед-это основная характеристика дислексии.			
14	Трудности с фонологической обработкой информации являются одним из наиболее важных недостатков при дислексии.			
15	Тесты на выявления уровня интеллекта полезны для выявления дислексии.			
16	Все учащиеся имеющие проблемы с навыком чтения страдают дислексией.			
17	Детям с дислексией можно помочь с помощью цветных линз/цветных накладок.			

18	Врачи могут выписать лекарства, чтобы помочь учащимся с дислексией.			
19	Мультисенсорное обучение в настоящее время не является эффективным методом обучения. (Мультисенсорное обучение – это метод обучения, при котором используются разные каналы восприятия информации (зрительный, слуховой, кинестетический и т.д.).			
20	Учащиеся, у которых есть нарушения чтения без видимой причины, являются дислексиками.			
21	Люди с дислексией не глупы и не ленивы. Термин «дислексия» дает возможность учащимся не чувствовать себя глупыми.			
22	Предоставление учащимся с дислексией дополнительных условий, таких как дополнительное время на тестах, более короткие письменные работы, специальные места в классе и т. д. это несправедливо по отношению к другим студентам.			
23	Специальные программы, которые сфокусированы на фонологические аспекты языка с визуальной поддержкой букв, эффективны для студентов с дислексией.			
24	Большинство учителей проходят интенсивную подготовку по работе с детьми с дислексией.			
25	Я думаю, что дислексия-это миф, проблема, которой не существует.			
26	Метод повторного чтения является полезной стратегией для улучшения беглости чтения.			
27	Нарушение связей между участками головного мозга является причиной дислексии.			
28	Студенты с дислексией нуждаются в структурированном, систематическом и последовательном обучении основным навыкам и стратегиям обучения.			
29	Дислексия это хроническое расстройство, часто оно не проходит с возрастом.			
30	Большинство учащихся с дислексией продолжают испытывать проблемы с чтением, став взрослыми.			
31	Многие студенты с дислексией имеют низкую самооценку.			

32	Дети с дислексией имеют проблемы с пониманием фонем и правописанием, но не с пониманием на слух.			
33	Применение индивидуального теста на чтение имеет важное значение для диагностики дислексии.			
34	Учащиеся с дислексией часто делают ошибки в правописании.			
35	Дислексия, как правило, длится в течение длительного времени.			
36	Дислексия характеризуется трудностями в обучении беглому чтению.			

Спасибо за участие в опросе!