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Jennifer Preschern

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INTERNATIONAL BACCALAUREATE PRIMARY YEARS TEACHERS'  
PERCEPTIONS ON EDUCATING STUDENTS WITH DYSLEXIA

A dissertation submitted in partial fulfillment  
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

to the faculty of the

DEPARTMENT OF EDUCATION SPECIALTIES  
of

THE SCHOOL OF EDUCATION

at

ST. JOHN'S UNIVERSITY

New York

by

Jennifer Preschern

Date Submitted : 2/04/2021

Date Approved : 5/19/2021

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Jennifer Preschern

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Kyle Cook

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## ABSTRACT

### INTERNATIONAL BACCALAUREATE PRIMARY YEARS TEACHERS' PERCEPTIONS ON EDUCATING STUDENTS WITH DYSLEXIA

Jennifer Preschern

Global organizations, such as the United Nations, have increasingly focused on ensuring that students with special needs are receiving high quality education. With schools in over 158 countries worldwide, the International Baccalaureate (IB) system provides an ideal forum to investigate if students with dyslexia globally are receiving adequate instruction. Yet, there is a general lack of research investigating IB schools, specifically for students with learning differences such as dyslexia. Providing a curriculum framework for students ages three to 12, the Primary Years Program (PYP) forms the foundation of the IB system. This quantitative research study used online survey methods to assess IB PYP teacher perceptions of educating students with dyslexia with a global sample of IB PYP teachers. Through a combination of descriptive and regression analyses, this research describes overall IB PYP teacher understanding of dyslexia, as well as identifies potential educational barriers that affect students with dyslexia. As a result of this research, IB instructors and administrators may have a better understanding of potential areas for growth in order to ensure that students internationally with dyslexia receive high quality education.

## DEDICATION

I'd like to thank several people for supporting me on this journey. First, I want to thank my parents for always encouraging me to pursue academic excellence. From my early childhood, my mother (also an educator) took on extra playground duties and after-school tutoring assignments in order to financially support my various academic pursuits. My dad encouraged both my brother and I to spread our wings and fly. As a result, I've had the opportunity to travel the world, live abroad, and become a student of the world. I've had fun storming the castle, dad.

I'd also like to thank my brother Dr. Tim McGee for being an inspiration. In college, he told me that teaching aerobics wasn't as hard as his marathons, so I ran a marathon. Then, he told me that marathons were not as challenging as triathlons, so I had to do an Ironman too. Tim got a PhD. I finally caught up. We are not (really) in a race, but pushing myself to keep up with you has always made me better.

I would also like to thank my daughters, Isabella and Veronika. I am inspired on a daily basis by their fearless abilities to integrate into new cultures. Watching them learn to speak several languages, make international friends, and grow into beautiful and kind women has been a great joy in my life. Thank you to both of you ladies for cooking and cleaning while I've been sitting in front of my computer working, every day.

Finally, I'd like to thank Richard Preschern, my husband. When I met him, I knew relatively little about the world outside of the USA. As an Austrian citizen and international student, he opened the world to me. I am forever changed because of his influence. Thank you for supporting me on my endless adventures.

## ACKNOWLEDGEMENTS

First, I'd like to thank my advisor, Dr. Kyle Cook, for her support throughout this process. I'm constantly amazed at the speed at which Dr. Cook answers emails. She has provided a constant stream of feedback throughout both my studies and this dissertation process. I'd also like to thank Dr. Olivia Stewart for her guidance. Dating back from her class in multi-literacies, she has inspired me to see literacy in new ways. Next, I'd like to thank Evan Ortlieb and the entire SJU school of education faculty. This cutting-edge program has revolutionized my understanding of what education is and could become.

In addition to the SJU staff and faculty, I want to thank my SJU peer cohort. Thanks to all of your endless messages, emails, and Whats App late night conversations, you have made me feel supported throughout this journey. Team Umbrage forever! Special thanks to Dona Carhart for being my constant cheerleader and leader of the pack. You are a special lady.

I'd also like to thank all of my colleagues over the years who have encouraged me to go back to school for the PhD and supported me professionally, including Kate Gottfred, John Lybolt, Abbie Olszewski, Molly and Rick Aceves, Hilary Holder, and Julie Irons. I've learned something from each and every one of you.

Finally, I'd like to thank my outstanding extended family. In particular, thank you TJ for being my copy editor. My paternal grandfather, Patrick McGee, was a dean at St. Johns University. It has been an honor to follow in so many McGee footsteps before me.

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# CHAPTER I

## INTRODUCTION

### Global Historical Background on Dyslexia

As one of the most common types of learning disabilities, dyslexia's prevalence has been estimated at 5-10% of school-aged children, depending on language and culture (Verhoeven et al., 2019; Wagner et al., 2020). Despite its prevalence, dyslexia is sometimes considered an *invisible disability* (Dreyer et al., 2020), and dyslexia advocates themselves have long faced criticism from those who allege dyslexia is a myth and those who contend students with dyslexia are unworthy of additional educational support (Nicolson, 1996; Worthy et al., 2018).

In the past two decades, researchers have identified genetic and neurobiological markers of dyslexia (Becker et al., 2017; Black et al., 2017; Eckert, 2004; Gialluisi et al., 2019). Well-documented methods for how to help students with dyslexia improve their reading abound (Compton, 2020; Fuchs et al., 2017; Lindstrom, 2019; Shaywitz & Shaywitz, 2020; Wanzek et al., 2017), and research from the fields of neuroscience and cognitive science can also inform literacy intervention (Aboud et al., 2018; D'Mello, 2018; Wolf & Stoodley, 2007).

Many schools globally, however, do not utilize effective teaching techniques based on extant dyslexia research (BBC, 2019; Boas, 2020; Landi et al., 2019; Sienknecht, 2020). Furthermore, many countries in the world still do not even recognize dyslexia as a disability (Mather et al., 2020). As a result, dyslexia-studies remains a very hot topic according to top literacy experts (Cassidy et al., 2020). This study contributes to educational discourses about dyslexia, as it analyzes International Baccalaureate Primary

Years Teachers' perceptions of dyslexia. Specifically, this project aims to uncover whether international teachers feel they have adequate preparation, resources, and support to help students with dyslexia.

In some countries, such as the United States and England, researchers and dyslexia advocates have spent decades lobbying for systemic laws, regulations, and educational supports to guarantee the rights of individuals with disabilities such as dyslexia. In the 1920s, Samuel Orton, a neuropathologist from the State University of Iowa, created the first program in the world specifically designed for students with dyslexia. Orton's program paired multi-sensory teaching strategies with systematic, sequential lessons focused on phonics (Institute for Multisensory Education, n.d.).

After the death of Dr. Orton in 1949, his widow, June Lyday Orton, formalized the Orton Society, which remains the oldest organization in the world dedicated to the study of dyslexia. Urged by advocates, such as the Orton Society and political activists (Moody, 2012), United States President Gerald Ford signed the first global special education law in 1968 — the *Education for All Handicapped Children Act* (Public Law 94.142) (Gerber, 2001). This law, now known as the *Individuals with Disabilities Education Act* (IDEA), upholds and protects the rights of infants, toddlers, children, and youths with disabilities and their families. In 1968, the law stated:

The term *specific learning disability* means a disorder in one or more basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, speak, write, spell or do mathematical calculations. The term includes such conditions as perceptual handicap, brain injury, minimal brain dysfunction, DYSLEXIA

(emphasis added), and developmental aphasia. Such terms do not include children who have learning disabilities which are the result of visual, hearing, or motor handicaps of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage (US Office of Education, 1977).

The Orton Society was renamed the Orton Dyslexia Society in 1982, due to growing acceptance of the term *dyslexia*. In 1994, the Orton Dyslexia Society, in partnership with the National Center for Learning Disabilities and the National Institute of Child Health and Development, created the first globally-accepted, official definition of dyslexia as part of their Definition Consensus Project (International Dyslexia Association, n.d.). This definition, which is still utilized by many states and countries today, reads as follows:

Dyslexia 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 growth of vocabulary and background knowledge.

This standardized definition aligned the professional community and laid the groundwork for important future North American public policy initiatives (Nicolson, 1996).

The United States Individuals with Disabilities Education Act (IDEA) was reauthorized in 2004, and again in 2015, with the Every Student Succeeds Act (2015).

However, it still does not specifically define dyslexia. Although individual states have to

provide the minimum rights and protections delineated by IDEA, they can individually decide how to address these issues (US Department of Education, 2015).

Dyslexia advocates in Britain have also long championed both national protection and teacher education to support students with disabilities. In 1962, several United Kingdom neurologists and psychologists opened the Word Blind Centre in Bloomsbury (University of Oxford, n.d.). The World Blind Centre endeavored to research the causes and the treatments of dyslexia. In addition, the group sought to advocate for students with dyslexia, oftentimes fighting against governmental and educational authorities who argued against the existence of dyslexia (Kirby, 2019). Following the closure of the Word Blind Centre in the early 1970s, more research centers and private dyslexia schools were opened in England. In 1972, many of these organizations joined to form the British Dyslexia Association (British Dyslexia Association, n.d.).

The British Dyslexia Association campaigned against the notion that dyslexia was a middle-class myth (Nicolson, 1996). Their campaign peaked in 1978, when the Baroness Mary Warnock authored the Warnock report, a study commissioned by the Department for Education and Science. Baroness Warnock reported that government officials told her “not to suggest that there is a special category of learning difficulty called dyslexia” (Warnock, 2013). Eventually, British dyslexia advocates scored their first real victory with the Education Act of 1981 (Education Act, 1981). The Education Act of 1981 finally implemented several of the Warnock report’s recommendations. Notably, the Education Act changed the language used to describe students. Whereas before students were described as handicapped, now they were described according to a

*continuum of need*. This linguistic change made it possible for students with dyslexia in England to receive support services through a formal *statement of special educational needs* (Education Act 1981). A decade later, the Education Act of 1993, and a subsequent Code of Practice, made it the responsibility of schools to identify and to support students with special needs as soon as possible (British Department of Education, 1994). This onus of responsibility resulted in students with dyslexia receiving treatment much earlier. In 2009, the United Kingdom government commissioned the ROSE Review, an independent group, to make recommendations on how to identify and teach children with dyslexia (Rose, 2009; University of Oxford, n.d.). This group made the definition of dyslexia official in Britain. It still reads as follows:

Dyslexia is a learning difficulty that primarily affects the skills involved in accurate and fluent word reading and spelling. Characteristic features of dyslexia are difficulties in phonological awareness, verbal memory and verbal processing speed. Dyslexia occurs across the range of intellectual abilities. Co-occurring difficulties may be seen in aspects of language, motor co-ordination, mental calculation, concentration and personal organization, but these are not, by themselves, markers of dyslexia.

Expanding on the work of the British Dyslexia Association and the United States-based International Dyslexia Association, the European Dyslexia Association (EDA) was founded in Brussels in 1987 (Mather, 2020). The EDA amalgamated similar organizations from Belgium, Ireland, Germany, Denmark, Norway, the Netherlands, France, and the United Kingdom. In the past ten years, the EDA has expanded to include these countries: Austria, Belgium, Cyprus, Czech Republic, Denmark, Finland, Greece,

Ireland, Italy, Lithuania, Luxembourg, North Cyprus, Malta, Poland, Portugal, San Marino, Slovenia, Spain, Sweden, and Switzerland. The EDA is still dedicated to its mission of informing people and policy-makers how to support individuals with dyslexia. Central to the EDA's mission is an insistence on providing an appropriate education that helps preserve individual self-esteem (European Dyslexia Association, n.d.).

In the past thirty years, other major governmental organizations have also started to advocate for the rights of people with disabilities. Inclusive education is now established as a global field of educational-research and has the ability to inform policy and practice (Hernández-Torrano, 2020; Slee, 2018). In 1994, for example, over 92 governments participated in the United Nations Educational, Scientific and Cultural Organization (UNESCO)'s *Salamanca Statement and Framework for Action on Special Needs Education*, which declared that every child has a right to have their unique characteristics, interests, abilities, and learning needs met (UNESCO, 1994). Similarly, the UN Convention on the Rights of Persons with Disabilities created a non-discriminatory agreement among signatories— and featured UN record-high participation (UN, n.d.). The non-discriminatory agreement outlined transformative changes in inclusive education and underscored improvements in educational practices for individuals with disabilities (UN, 2006).

Advocates and change-makers continue to rally behind inclusive pedagogy. In 2006, for instance, a group called Dyslexia and Literacy International (originally Dyslexia International) was granted official status with UNESCO. In 2010, Dyslexia and Literacy International helped coordinate the World Dyslexia Forum at UNESCO, inviting literacy experts from across the world to discuss literacy acquisition (Dyslexia and

Literacy International, n.d.) Dyslexia and Literacy International works with some of the most impoverished countries in the world and provides low-to-no-cost training for teachers. In addition, they currently provide free online dyslexia courses for teachers in a variety of languages.

Global advocacy groups and international educational agreements are widespread, but educational access for students with dyslexia remains fraught with challenges (Cassidy et al., 2020; Hernández-Torrano, 2020; Kiru & Cooc, 2018). Challenges remain for several reasons. First, providing learning support and differentiated instruction for students who struggle is not a universal goal. Second, resources are not allocated equitably in all countries (Cassidy et al., 2020; Mather, 2020).

In many countries, there is also variability regarding how disabilities such as dyslexia are defined, identified, and treated. China represents one such example of variability. The Chinese government has produced the China Special Education Promotion Plan (China's Law on the Protection of Persons with Disabilities, 1990), but the plan itself contains no recognition of dyslexia or any other learning disability. (Fu et al., 2020; Kim, et al., 2019). A similar problem besets Europe, where only half the countries currently consider dyslexia as a special education need (Gyoerfi & Smythe, 2010; Ramberg & Watson, 2020). In Austria, to cite another example, students can receive one hour per week of remedial teaching (*Förderunterricht*) and support to learn German as a “non-regular student” (*außerordentliche Schüler*) or through ancillary German instruction (Nusche et al., 2016). However, there is no national policy that identifies or supports learning disabilities, such as dyslexia, within the general school framework. In 2020, the European Dyslexia Association (EDA) recognized the



exclusionary practices of many schools when it comes to dyslexia. The EDA wrote an open letter to the European members of parliament, which testified that millions of citizens are excluded from educational and employment opportunities when dyslexia and other learning disorders are not taken into account. The EDA's letter states that "European standardization and policies do not sufficiently take into account the needs of people with disabilities and are not sufficiently enforced at national level" (European Dyslexia Association, 2020).

In 2020, Mather et al. briefly documented the current state of dyslexia around the world. Utilizing an intensive search-engine study, Mather's team documented the global online presence of dyslexia. Their study's objective was to document how dyslexia is viewed internationally. According to Mather et al., the world-leading dyslexia organizations remain the following: International Dyslexia Association, European Dyslexia Association, and Dyslexia and Literacy International (partner of UNESCO). Although Mather's study concludes that dyslexia has a strong online presence internationally, many countries still do not acknowledge dyslexia and many individuals with dyslexia continue to be stigmatized across the world.

### **International Baccalaureate System Background**

The International Baccalaureate (IB) system, founded in 1968, currently offers programs worldwide in over 4,964 schools in 153 countries. Its mission is to develop inquiring, knowledgeable, and caring young people who help create a better and more peaceful world through intercultural understanding and respect. To this end, the organization works with schools, governments and international organizations to develop

challenging programs of international education and rigorous assessment (International Baccalaureate, 2019).

Originally, the IB system focused on secondary school students (roughly ages 14-18) in a Diploma Program (DP). However, the program expanded to include a Middle Years Program (MYP) in 1994 and a Primary Years Program (PYP) in 1997 (International Baccalaureate, 2017a). The IB offers schools, both private and public, a framework for learning that focuses on developing inquiring, knowledgeable, and caring young people who help to create a better and more peaceful world through intercultural understanding and respect (International Baccalaureate, 2017b). While not providing directive curriculum requirements, the IB system offers schools an educational framework. Schools worldwide can choose to become IB accredited by following the IB guidelines and process (International Baccalaureate, n.d.).

International schools, which operate alongside but outside of national public-school systems, are encouraged to adapt practices that support students who have additional needs, such as dyslexia, under the IB guidelines (Gabor, 2010). Schools are also encouraged to create Individual Learning Plans for students (International Baccalaureate, 2016).

At this time, the IB provides guidelines that suggest students with learning differences should be included in education. According to the IB, inclusion can be defined as:

An ongoing process that aims to increase access and engagement in learning for all students by identifying and removing barriers to learning. It involves change

and is facilitated in a culture of collaboration, mutual respect, support and problem solving (International Baccalaureate, 2016).

The IB offers six strategies to help create an inclusive school (International Baccalaureate, 2016). These include creating optimal learning environments that celebrate and embrace the diversity of all learners, using technology that is accessible to all learners, developing collaborative learning activities that include initiatives with shared goals and involve all members of the school community, promoting approaches to learning that develop affective and metacognitive skills, creating accessible assessments in terms of design, content and medium, and teaching to variability. This also includes differentiation (Tomlinson & Cunningham, 2003; International Baccalaureate, 2014) and Universal Design for Learning (UDL) – a framework for curriculum development that provides all students with equal opportunities to learn (Rose & Gavel, 2010; Rose & Meyer, 2011).

However, unlike public schools in the United States or Britain, where laws specifically govern how schools are expected to operate and protect students with learning differences, the international education sector, specifically within the IB, currently has no specific regulations or protections for children with special needs (Pletser, 2016). For example, in the USA, the federal *Individuals with Education Act* describes student rights (Individuals with Disabilities Education Act, 2004) while states and local school districts define special education processes and labels. By contrast, the IB school system does not have specific regulations, procedures, and labels in place like this. According to the IB, it is the individual school's responsibility to determine how to turn inclusion theory into practice (IB Community Blog, 2019). However, many IB

schools are located in countries with no national legislation regarding special education. It is unknown if this influences educational practices for students with special needs, specifically dyslexia, within the IB PYP setting. It is also not well understood if IB PYP teachers who work in countries with national special education policies, like the USA or Britain, are utilizing these national frameworks within their school settings. In addition, there are no IB systemic policy documents specifically protecting education for students with dyslexia or other reading difficulties. There is little research that looks at whether or not this influences instruction in IB PYP schools.

Another focus in IB schools is on removing barriers to learning (IB Community Blog, 2019). The IB states barriers to learning might include the ways schools are organized and resourced. School cultures and policies, approaches to teaching and learning, physical aspects of buildings, and the ways in which individuals within the school community interact on a daily basis might also create barriers (International Baccalaureate, 2016). For example, Dr. Jayne Pletser, curriculum manager for inclusive education at the IB, explains IB inclusion as “an ongoing process to remove barriers to learning, with respect to all students. The IB acknowledges the changing histories of students – barriers to learning and assessment are not restricted to those with a ‘statement of needs’” (IB Community Blog, 2019).

At this time, there is little to no research that examines if students with dyslexia are having their needs met within the IB system. There is also very little research conducted on the PYP in general (Lochmiller et al., 2016; McDonald-Lane, 2020). There are few studies assessing these students’ successes or challenges, nor are there studies looking at how IB PYP teachers perceive students with disabilities, specifically those

with reading disabilities within the IB system. It is unknown if there are, in fact, barriers to learning for students with special needs, specifically dyslexia. For example, are schools organized with adequate funding and resources to support students with dyslexia? Have IB PYP schools created their own policies and procedures to help students with dyslexia? Do IB PYP teachers have enough education about dyslexia? In 2016, Pletser noted lack of IB research in the area of special education by quoting Haldimann (1998) by stating “research pertaining to special learning needs populations in international schools is relatively uncommon,” (p. 133), Pletser then describes how there is still a lack of research at the time of her literature review.

### **Purpose of the Study**

There is limited research examining if IB Primary Years Program (PYP) students with dyslexia are receiving adequate support, including sufficiently-funded support programs and teachers with knowledge about dyslexia. It is also unclear whether factors such as lack of IB shared special education terminology and specific procedures to identify dyslexia influence student education. While many global organizations and advocacy groups have created guides for how to help students with dyslexia, it is not well understood if this knowledge is being utilized within the IB system. This study helps fill this knowledge gap by using a correlational survey research design as the purpose is to describe and interpret the current status of individuals, settings, and conditions (Mertler, 2018).

Specifically, the purpose of the study was to analyze IB PYP teacher knowledge about dyslexia, as well as to explore other potential barriers to instructing students with dyslexia. A correlational survey design (Creswell & Creswell, 2018) was used to examine

IB teacher perceptions of barriers they face educating students with reading difficulties or dyslexia.

### **Significance of the Study**

Misconceptions about dyslexia can result in students being considered lazy or unintelligent (Mather et al., 2020). Students with dyslexia are also more likely to be teased or bullied (Anderson et al., 2020; Beckman et al, 2019). In addition, many individuals with dyslexia struggle because their disability is hidden, and has not been recognized, diagnosed, and addressed (Leitão et al., 2017).

Understanding teacher perceptions of educating students with dyslexia is especially important because teacher attitude is related to a variety of factors from student academics to personal life (Castillo & Gilger, 2018, Hornstra et. al., 2010). Educator self-perceived efficacy also relates to the way that they interact with students (Woodcock et al., 2019). As a result, educators' perceptions of inclusion and awareness of the hindrances are crucial in order to create an inclusive learning environments (Andrikopoulous & Ifanti, 2018; Hoenig et al., 2008). This study aimed to explore IB PYP teacher knowledge and concerns about dyslexia, as the success of any special education program often hangs on buy-in of skilled classroom teachers (Yadav et al., 2015; Woodcock & Woolfson, 2019).

Results from this study can also be utilized to help the global International Baccalaureate system improve educational outcomes for students with dyslexia. Specifically, this study will serve as a foundational analysis of potential barriers that teachers are facing.

## Research Questions

The purpose of this study was to examine IB PYP teacher perceptions of educating students with dyslexia. Survey data was collected to address the questions:

1. What do IB teachers know about dyslexia in the domains of general information, symptoms/diagnosis, and treatment of dyslexia?
2. What are some teacher-perceived barriers that influence education of students with dyslexia within the IB classroom?
3. How does teacher knowledge about dyslexia, as well as overall teacher education level, predict perceived barriers of working with students with dyslexia?"

## Definition of Terms

**International Baccalaureate (IB).** The International Baccalaureate system was founded in 1968 in Geneva, Switzerland. Its mission is to develop inquiring, knowledgeable, and caring young people who help create a better and more peaceful world through intercultural understanding and respect. To this end, the organization works with schools, governments and international organizations to develop challenging programs of international education and rigorous assessment (International Baccalaureate, 2019). As of May, 2020, there were 7,002 IB programs being offered worldwide, across 5,284 schools in 158 countries (International Baccalaureate, n.d.). While not providing directive curriculum requirements, the IB system offers schools an educational framework. Schools worldwide can choose to become IB accredited by following the IB guidelines and process (International Baccalaureate, n.d.). The IB can be

offered in English, Spanish, or French; although many schools supplement with other additional languages.

**Barriers to Instruction.** The concept of barriers to instruction forms one of the principles of inclusion within IB schools (International Baccalaureate, 2016). According to the IB, barriers to learning might include the way schools are organized and resourced. This includes school cultures and policies, approaches to teaching and learning, physical aspects of buildings, and the ways in which individuals within the school community interact on a daily basis. In this study, barriers to learning might include teacher knowledge of dyslexia, school funding and supports, procedures for identification/treatment of students with dyslexia, and use of special education terms (dyslexia labels).

**Differentiation.** At a basic level, differentiation means that teachers can provide multiple options for students to take in information and express what they learn (Deunk et al., 2018). A differentiated classroom provides different avenues to acquire content, process or make sense of ideas, and develop products. (Tomilson, 2014).

**Dyslexia.** In reviewing almost 30 years of definitions, Gabor (2010) identified 34 different indicators of dyslexia. For the purposes of this study, dyslexia will be defined in accordance with the First Step Act (2018) (USA) which states: The term dyslexia means an unexpected difficulty in reading for an individual who has the intelligence to be a much better reader, most commonly caused by a difficulty in the phonological processing (the appreciation of the individual sounds of a spoken language), which affects the ability of an individual to speak, read, and spell (First Step Act, 2018).



**Inclusion.** An ongoing process that aims to increase access and engagement in learning for all students by identifying and removing barriers to learning. It involves change and is facilitated in a culture of collaboration, mutual respect, support and problem solving (International Baccalaureate, 2016).

**Primary Years Program (PYP).** The Primary Years program is the first step of the International Baccalaureate system. The PYP provides a curriculum framework for students aged 3 to 12. As of 3 September 2019, there are 1,782 schools offering the PYP, in 109 different countries worldwide (International Baccalaureate, n.d.). The PYP curriculum framework is built around six transdisciplinary themes including: who we are, where we are in place and time, how we express ourselves, how the world works, how we organize ourselves, sharing the planet.

**Universal Design for Learning (UDL).** UDL is based on the idea that variability among learners is the norm (Rose & Gravel, 2010). UDL is a method of that allows teachers to use flexible instruction, techniques and strategies to meet diverse student needs.

### **Positionality**

While I attempted to take an etic, objective approach to this research study, like every researcher, I bring certain biases to how I view the world. As an American-Speech-Language-Hearing Association credentialed speech/language pathologist and Illinois-certified learning disabilities teacher with over 20 years of experience serving students of all ages, helping them improve their language and literacy practices in schools, my bias is to create highly structured special education systems for students with disabilities.

For over 5 years, I have lived and worked abroad in Europe. However, as a citizen of the United States of America, a country with specific national policies regarding

special education, my bias is also to create some form of international special education policy statements. In addition, as a member of several reading organizations, including the International Dyslexia Association, my further bias is to ensure that all teachers have a shared language of instruction for special education terms, such as dyslexia.

## CHAPTER II

### REVIEW OF RELATED RESEARCH

#### Theoretical/Conceptual Framework

This study was framed by an Ecological Systems Theory (Bronfenbrenner, 1994; Brofenbrenner & Morris, 2006; Ettekal & Mahoney, 2016), as it examined factors that restricted student access to educational opportunities. Ecological Systems Theory states that individuals interact within interdependent systems that shape their experiences, opportunities, and personal identities. These systems include: micro-, meso-, exo-, and macrosystems. The levels move from smaller, proximal, individual settings to larger, distal settings that indirectly influence people.

The microsystem includes individual and collective capacities, the mesosystem includes interrelationships between contexts, the exosystem includes organization factors, and the macrosystem includes societal and legislative influences (Price & McCallum, 2015). According to Bronfenbrenner (1979), the evolving interactions between the individual (teacher) and the environment (microsystem) is influenced by perceptions, capacities, and method in managing this interaction. The various levels within ecological systems theory are often presented graphically as a series of four systems nested around a focal individual like a set of concentric circles (Ettekal & Mahoney, 2016).

Originally used to describe the systems surrounding a child's biological and psychological development, Ecological Systems Theory has been broadened to help understand multifaceted and interactive effects of personal and environmental factors that determine behavior in various fields (Zavelevsky & Lishchinsky, 2020). Ecological Systems Theory can be particularly useful for understanding teacher perspectives

regarding student access to the general education context, as teachers are also situated in complex social contexts (Ruppar et al., 2017). The goal of this study was to analyze teachers' perspectives on educating students with dyslexia from several systems, as all levels will impact a child with dyslexia within the IB PYP setting.

**Microsystem and Mesosystem:** The microsystem acknowledges “activities, roles, and interpersonal relations experienced by the person in a given setting” (Bronfenbrenner, 1979, p. 22). This is surrounded by the mesosystem which “comprises the interrelations among two or more settings in which the developing person actively participates” (Bronfenbrenner, 1979, p. 25). For this study, these layers include teacher demographic information, as well as teacher knowledge about dyslexia.

**Exosystem:** The exosystem consists of social structures, events, and processes which indirectly impact the student in their immediate environment. This includes actions which may “affect, or are affected by, what happens in the setting containing the [...] person” (Bronfenbrenner, 1979, p. 25). This level might also include school decision making processes, practice in other classrooms and school policy over which they have no influence but could impact upon the organization (Dobson & Douglas, 2020). This survey in this research will analyze factors such as individual school funding, use of definitions, and support services.

**Macrosystem:** The most distal process relates to cultural, ideology, and wider factors. The macrosystem refers to school policies, structures, cultural, and social values impacting students with disabilities and their access to inclusive education (Kurth et al., 2018). In this study, questions were asked about overall perception of labels, policies, and guidelines for dyslexia.

## **Related Research**

### **International Baccalaureate Inclusion Model**

At this time, the International Baccalaureate (IB) system does not have specific regulations and policies for special education. However, schools are encouraged to be inclusive of all learning needs. According to Dr. Jayne Pletser, global curriculum manager for inclusive education at the IB, inclusion is “an ongoing process to remove barriers to learning, with respect to all students. The IB acknowledges the changing histories of students – barriers to learning and assessment are not restricted to those with a ‘statement of needs.’” With this being said, Dr. Pletser also stated that how a school puts this definition into practice is dependent on the school context, culture, and national legislation of the school’s location (IB Community Blog, 2019).

To date there are no studies directly related to inclusion of students with dyslexia within the IB PYP system. The little research that currently exists for inclusion within the IB system is focused on students enrolled in the IB Diploma Program (DP), which serves high school students. For example, a 2020 study by Bittencourt analyzed whether inclusive IB DP policies created higher achievement levels and more social cohesion for underserved school students in Ecuador. During a year-long ethnographic study of a low-income public school with an IB DP option, Bittencourt outlined that the IB program did not in fact increase the school’s social inclusion and cohesion. Instead, it led to a dichotomized school, creating tensions between students and staff. It also stigmatized students who were not enrolled or accepted into the IB program.

Another 2020 study by Chae utilized a transcendental phenomenological research design to identify barriers preventing underrepresented student access to the IB diploma

program. She found families and students struggled to navigate the curriculum. As a result, they struggled with the IB DP. No studies to my knowledge, have been conducted to identify whether or not the inclusive guidelines of the IB are in resulting in students with special needs being successfully included in IB PYP programs.

### **Universal Design for Learning within the IB**

The IB encourages schools to use Universal Design for Learning (UDL) as one method for creating an inclusive environment for all students (International Baccalaureate, 2016; Rao et al., 2016). UDL is based on the concept of universal design (UD), which was developed in the 1980s by Ronald Mace, an architect (Zazler & Joines, 2009). Originally, UD focused on creating physical access to the environment, with the idea that all areas could become more accessible to people with disabilities (Mace, 1998). In the 1980s, researchers at the Center for Applied Special Technologies (CAST) extended this concept to the learning environment, focusing on curriculum development and instruction (Ralabate, 2011; Rose & Meyer, 2006). They called this modification Universal Design for Learning. UDL provides a framework for creating instructional goals, methods, materials and assessments that accurately assess learner progress (Cressey, 2020; Glass et al., 2013). According to CAST (2018), UDL has three main principles:

- **Multiple means of representation:** This includes using multi-modal tools to provide information through a combination of visual, auditory, oral, and text-formats.
- **Multiple means of engagement:** Teachers are encouraged to connect lessons with authentic and relevant information.

- Multiple means of action and expression: In this UDL principle, students are encouraged to demonstrate knowledge in a variety of ways, including using both digital and online tools.

According to UDL, teachers can meet the needs of diverse learners by flexibly presenting content, designing activities to motivate and engage students, and providing options for students to demonstrate their understanding of the content (Meyer et al., 2014; Schreiber, 2017).

In an IB-sanctioned 2016 study, Rao et al. explored how IB educators and administrators are implementing UDL in classrooms and school settings across all three IB regions (Africa, Europe, and the Middle East; Asia-Pacific; and the Americas). Survey data was collected from 127 participants, and 10 participants were selected for case study interviews. This study looked at all grade levels of the IB curriculum, with 14% at the Primary Years Level, 12% at Middle Years Program, 98% at Diploma Program, and 6% at Career Certificate Level. Some respondents marked more than one grade level if the school included multiple programs. The results indicate that IB educators are implementing inclusive practices, although their degree of knowledge about the UDL framework itself varies. IB teachers and administrators are familiar with various strategies to differentiate instruction, integrate flexible options during instruction, and implement instructional strategies to engage and motivate all learners. The authors suggested that more research should focus on a broader sample of schools, especially those which operate under national special education laws that protect the right of all students to an education. In addition, the schools in the case studies had significant resources available to them. The authors also suggested expanding research to include

other less-well funded schools. Finally, even though inclusive practices were implemented at high levels in the chosen schools, study participants still frequently reported that they needed more time and knowledge to implement the practices of UDL. This study did not investigate teacher perceptions whether students with disabilities, including dyslexia, were having their needs met. Finally, the authors suggested that more research is needed to examine specific areas where teachers need support in order to better implement practices in their classrooms.

### **International Baccalaureate and Differentiation**

Another aspect of inclusion within IB schools is differentiation. The IB defines differentiation as a process of identifying within each learner the most effective strategies for achieving agreed goals so learning opportunities can be created that enable every student to develop, pursue and achieve appropriate personal learning goals (International Baccalaureate, 2016). Using the works of Tomlinson and Cunningham (2003), the IB further describes the three aspects of differentiation: content (information that a student should learn and understand), process (methods in which student gains access to the knowledge, understanding, and skills), and product (evidence that students can provide for what they know and understand).

There has been very limited documentation of potential problems that IB schools face at all grade levels regarding implementing differentiation for students with learning differences. Researchers at the University of Georgia's Education Policy and Evaluation Center, for example, collected data in three elementary schools in Georgia to determine how the PYP was implemented (Hall et al., 2009). While this study did not investigate if students with special needs, such as dyslexia, were specifically having their needs met,



this study identified six strategies that were needed for successful PYP implementation in general: whole-school immersion, collaborative planning, continuous training, availability of resources, community involvement strategies, and supportive school leadership. In this particular study, the schools were able to find support from state education agencies and school districts in the United States of America. By contrast, Lochmiller and colleagues (2016) analyzed challenges facing IB PYP implementation within four Colombian schools for bilingual learners. In this study, the authors noted that coherent, sustained support to classroom teachers at all levels was a missing element to IB PYP best practice implementation, as there were no available state or local resources.

At the high school IB level, Dulfer (2019) conducted a series of case studies analyzing differentiation within IB DP schools. His results indicate that IB DP teachers also struggled with processes for inclusion, especially when content loads were high. He concluded that teachers need support in order to create flexible teaching to meet the individual learning needs of students (Allcock & Hulme, 2010; Santangelo & Tomlinson, 2009). At this time, little to no research has investigated whether differentiation within IB PYP schools includes instruction specifically targeted to meet the specific needs of students with dyslexia.

### **Potential Barriers to Instruction**

Another way that the IB encourages inclusion of all students is by removing barriers to instruction. The IB describes that barriers to learning include school organization, resources, culture, and policies. Approaches to learning, building design, and student-community interactions create additional potential barriers (International Baccalaureate, 2016). Dr. Jayne Pletser, global curriculum stated that “inclusion can be

impeded when learning barriers are not identified and removed” (International Baccalaureate Community Blog, 2019).

While there are currently little to no studies analyzing barriers that students with dyslexia may face within IB PYP schools, there are many studies globally that document barriers in other school contexts for students with dyslexia. Issues that might affect IB PYP schools include: lack of funding and uniform policy, multiple definitions of dyslexia, controversy over labelling, and lack of teacher education on dyslexia.

**Uniform Funding and Policy.** Lack of both funding and uniform policy to support and govern practice are more potential barriers. Poor funding for extra learning support in some countries makes it difficult to develop inclusive practices (Pletser, 2016; Woodcock & Wolfson, 2019). Successful implementation of the IB PYP for all students is resource-heavy (Bittencourt, 2020). This has been identified as a barrier to successful IB PYP implementation in general, in particular for developing countries and state-sponsored schools (Barnett, 2013, Resnik, 2012). Specific concerns include lack of funding for purchasing and retaining high-quality resources, hiring and retaining high quality teachers, and providing professional development (Gaetane et al., 2015).

In a 2020 study, McDonald-Lane conducted case study analysis with IB PYP teachers to identify areas where teachers needed support, in general. Her research participants indicated that lack of resources was a barrier to successfully implementing the PYP curriculum for all students. Participants also indicated that information on the IB’s website is too varied, confusing, and hard to navigate. Many of the IB resources are also not applicable to concepts being taught. In addition, teachers struggled to find

enough time to adjust resources. McDonald-Lane did not specifically investigate the impact of policy, funding, and resources on students with special needs.

According to the IB, schools should create inclusive policies using national legislation from the schools' location as a guide (IB Community Blog, 2019). However, many countries have variable, unclear policies. Others lack policy for special needs and dyslexia completely. For example, the United States Individuals with Disabilities Education Act (IDEA) legislation recognizes specific learning disabilities as a category (Individuals with Disabilities Education Act, 2004). IDEA governs how states and public agencies must provide early intervention, special education, and related services for more than 6.5 million eligible US infants, toddlers, children, and youths with disabilities (Individuals with Disabilities Education Act, 2004). While IDEA does not specifically identify the category dyslexia, some individual state laws do. However, specific language regarding dyslexia remains blurry and unspecified in many states (Zirkel, 2020). In addition, concerns still remain about how best to operationalize policy and definitions (Al Otaiba & Petscher, 2020).

As another example, only half the countries in Europe consider dyslexia as a special education need (Gyoerfi & Smythe, 2010, Ramberg & Watson, 2020). The European Dyslexia Association wrote a letter to the members of European Parliament in 2020 reminding all candidates that "millions of citizens are still excluded from school and employment in Europe as dyslexia and specific learning disorders are often poorly taken into account" (European Dyslexia Association, 2020).

Moreover, the China Special Education Promotion Plan also has no category for dyslexia (Fu et. al., 2020; Kim et al., 2019). According to Wang Lei, director of Weining

Dyslexia Education Center which is one of the few centers to help students with dyslexia in mainland China, it is difficult to convince both parents and schools that dyslexia is a real disability due to the lack of educational policies for students with dyslexia (Yiwen, 2018).

Finally, there is also no specific policy regarding dyslexia in India. A 2012 Indian *Rights of Persons Disabilities Bill* required schools to detect specific learning disabilities, but implementation still varies from state to state with only 4 states, Maharashtra, Karnataka, Kerala and Delhi, taking serious action (Sadhu, 2015). As a result, children in India with dyslexia and other learning disabilities have often been undiagnosed and labelled as “difficult” or “not bright,” rendering students socially and vocationally disadvantaged (Shetty, 2014). It is not clear how this variability in national policy impacts teachers and students with dyslexia within IB PYP schools.

**Defining Dyslexia and Disability.** The definition of dyslexia itself is another possible barrier to learning for students with dyslexia in IB schools. Dickman (2017) describes that a definition, such as the definition of dyslexia, has a life cycle. First, it informs research that requires common cohorts to promote replicability. Then, it promotes practice to identify effective principles of instruction. Finally, it creates policy to identify the demographic entitled to such research-based practice. Various organizations in countries around the world define dyslexia differently (Mather et al., 2020). In reviewing almost 30 years of definitions, Gabor (2010) identified 34 different indicators of dyslexia. Some countries do not even have a recognized description of dyslexia. For example, only seven European countries (Bulgaria, Denmark, Hungary, Poland, Romania, Sweden, United Kingdom) have a national level official definition

(Gyorfi & Smythe, 2010). Lack of shared teacher language for disabilities is a documented barrier for instruction in other educational settings (Broadbent, 2018; Wagner et al., 2019).

International schools are often comprised of teachers from around the globe. It is unknown if the lack of global shared terminology affects instruction within individual IB PYP schools. Furthermore, studying these differences in policies and definitions is difficult to conduct and implement without unified global terminology (European Agency, 2018). The concept of labelling a child is also still controversial around the world. Lacking associated physical signs or symptoms, dyslexia is often considered an invisible disability (Dreyer et al., 2020). As a result, students labeled dyslexic are frequently considered simply lacking in motivation or commitment (Osterholm et al., 2007). Some professionals do not like labelling students at all because they feel that labels do more damage than good (Boyle, 2007; Cuttler & Ryckmann, 2018; Elliot 2020; Osterholm et al., 2007; Shifrer, 2013). There is also a question whether labelling a student as “dyslexic” creates a sense in teachers that the problems within the child are immutable (Gibbs & Elliot, 2015; Gibbs, et al., 2020). Dr. Jayne Pletser, IB Global Curriculum Manager for Inclusive Education, stated that the IB is not focused on special education labels, as they are not helpful. She stated “They do not tell us about the individual student, their strengths or interests, but describe a whole range of issues that might have very little to do with their learning needs. Inclusion can only be successfully achieved in a culture of collaboration, mutual respect, support and problem solving.” (International Baccalaureate Community Blog, 2015).

By contrast, others feel that labels help professionals provide quality service to children and help keep focus on the child (Gallagher, 1976; Gwernan-Jones & Burden, 2010; Lindstrom, 2019; Riddick, 2000). In addition, with neuroscience research identifying brain differences in students with dyslexia (Centanni, 2020), some claim that the label dyslexic is justified, as there is actually a quantifiable medical neurological difference (Camilleri et al., 2020). It is also unknown how IB PYP teachers perceive special education labels, like dyslexia.

**Teacher Knowledge of Dyslexia.** Another potential barrier is lack of IB PYP teacher knowledge about dyslexia. Dyslexia is often misunderstood and educators frequently attributed the cause of dyslexia to a visual deficit (Hudson et al., 2007; Wadlington & Wadlington, 2005; Washburn et al., 2011). However, it is widely accepted that dyslexia is language based and characterized by poor phonological processing (Lyon et al., 2003; Snowling, 2000; Perfetti et al., 2019; Torgeson et al., 1997; Vellutino et al., 2004; Wagner et al., 1997). In order to properly educate a student with dyslexia, teachers must be familiar with basic language constructs such as phonology, orthography, and morphology (Bos et al., 2001; Cunningham et al., 2019; Washburn et al., 2011; Wong, 2020). Moats (2009), in her seminal study on teacher knowledge, stated that teachers' of beginning readers need to know phonological units of English, such as rhymes, syllables, and phonemes. Snow, Burns, and Griffin (2005) stated that teachers' knowledge of English orthography and morphology would also help their students' understanding of word structure.

No research study has directly analyzed IB teachers' familiarity with dyslexia. However, other research studies have demonstrated that teachers worldwide lack

understanding of these basic language constructs necessary to help students with dyslexia (Knight, 2018; Mather et al., 2020; Soriano-Ferrer et al., 2016; Stark et al., 2016; Washburn et al., 2016; Washburn et al., 2017; Wong, 2020; Worthy et al., 2016; Yin, 2020; Zhao et al., 2016). Teachers in studies worldwide have also reported that they need more training to help students with dyslexia (Brown & Bell, 2014; Hauerwas & Mahon, 2018; Peltier et al., 2020; Yin, 2020). Further, Binks-Cantrell, Washburn, Joshi, and Hougen (2012) supported the basic notion that teachers cannot teach what they don't know.

### **Summary**

The International Baccalaureate System encourages inclusion of all students within the Primary Years Program. In order to support inclusion, the IB encourages use of Universal Design for Learning and differentiation. In addition, educators are encouraged to identify and reduce barriers to learning such as school organization and resources, school policies, instructional approaches, school interactions, and physical layout of the school. As the IB does not provide specifications, individual schools must decide how to put these ideas into practice. At this time, there is little research analyzing whether schools are using these general guidelines to successfully educate students with learning disabilities, specifically dyslexia. There are many potential barriers that IB PYP educators might face including lack of individual school policy and funding, unclear definitions of dyslexia, various opinions about labels, and lack of teacher knowledge on dyslexia. There are few studies analyzing whether these issues create barriers to IB PYP teachers. This study aims to fill this gap.

## CHAPTER III

### METHODS

#### Specific Research Questions/ Hypotheses

The purpose of this study was to examine IB PYP teacher perceptions of educating students with dyslexia. Survey data was collected to address the following research questions:

**Research Question One.** What do IB teachers know about dyslexia in the domains of general information, symptoms/diagnosis, and treatment of dyslexia?

**Research Question Two.** What are some barriers that influence education of students with dyslexia within the IB classroom?

**Research Question Three.** How does teacher knowledge about dyslexia, as well as overall teacher education level, predict perceived barriers of working with students with dyslexia?

For research question one, I hypothesized that there would be variability in what teachers know. For example, some teachers would be more familiar with how to identify and treat dyslexia than others. For research question two, I hypothesized that teachers would confirm barriers, including lack of funding and support, previously identified in research. Research question three included two parts. Specifically, it assessed the connection between teacher dyslexia knowledge and overall teacher education and number of perceived barriers. I hypothesized that as teacher knowledge and education increase, overall barriers would increase. At the same time, I also hypothesized that more dyslexia knowledge and overall education would result in fewer barriers for questions that look at adequacy of teacher training, as previous research states that teacher training



is the most important factor in meeting the needs of students with dyslexia (Knight, 2017; Nijakowska, 2019). Consequently, I planned to investigate both the overall number of barriers as well as the relationship of dyslexia-knowledge and overall education level on individual barriers. The null hypothesis was that knowledge of dyslexia and teacher education level would both have no influence on perceived barriers.

### **Research Design**

This study utilized an online survey design in order to provide a quantitative description of IB PYP teacher knowledge and opinions (Creswell & Creswell, 2018). The study was based on Ecological Systems Theory (Bronfenbrenner, 1994; Bronfenbrenner & Morris, 2006; Ettekal & Mahoney, 2016). This theory has been used in past research to understand teacher perspectives towards student access to the general education environment (Ruppar et al., 2017). This study design aimed to look at teacher perspectives on all of the inter-connected systems. A survey method was chosen for the economy of the design and constraints that preclude other designs. Considering there was very limited research on the topic of dyslexia within the IB system, I also sought to obtain opinions from a wide range of teachers for the purpose of the exploratory study. Participants for the survey were recruited by a multi-faceted sampling technique, including convenience sampling (Creswell & Creswell, 2018) and snowball sampling (Huck, 2012).

### **Sample**

There were no previous studies looking at the correlation of teacher knowledge and factors that relate to dyslexia services in order to determine a power analysis as suggested by Creswell and Creswell (2018). However, a survey study by Rao, et al.

(2016) analyzed IB teacher perceptions of *Universal Design for Learning* with 127 participants. Therefore, this was the target number of this study.

Two hundred and twenty-eight participants started the survey. Ten were removed from the sample because they completed less than five questions. Therefore, the analysis was conducted on a sample of 218 International Baccalaureate (IB) Primary Years Program (PYP) teachers who work in English-speaking schools. Participants were working in 52 different countries, across all six continents with 12.39% working in North America, 6.42% in South America, 17.43% in Europe, 10.56% in Africa, and 32.11% in Asia, and 6.42% in Australia (See Table 1 for participant school location by continent and country).

**Table 1**

*Participant School Location*

Continent *	n	%	Continent	n	%
North America	27	12.39%	Africa	23	10.56%
Canada	3		Botswana	8	
Virgin Islands	1		Egypt	3	
USA	23		Ghana	1	
South America	14	6.42%	Jordan	2	
Brazil	3		Mauritius	1	
Chile	2		Nigeria	1	
Ecuador	1		Mauritius	1	
Mexico	2		Mozambique	1	
Peru	3		South Africa	2	
Uruguay	3		Uganda	1	
Europe	38	17.43%	United Republic of Tanzania	1	
Austria	13		Zimbabwe	1	
Belgium	1		Asia	70	32.11%
Germany	3		Azerbaijan	1	
Norway	3		Bangladesh	1	
Poland	3		Cambodia	2	
Portugal	1		China	7	
Spain	2		Hong Kong	5	
Switzerland	3		India	24	
Sweden	2				

Continent *	n	%	Continent	n	%
Turkey	1		Indonesia	4	
UK and Northern Ireland	6		Japan	1	
Australia	14	6.42%	Kazakhstan	1	
Australia	9		Lebanon	1	
Fiji	5		Mongolia	1	
			Pakistan	8	
			Philippines	1	
			Republic of Korea	1	
			Russian Federation	2	
			Saudi Arabia	2	
			Singapore	4	
			Thailand	2	
			UAE	1	
			Vietnam	1	
			Missing Data	27	12.40%

\* Islands categorized by closest continent, n=218

Participants were citizens of 47 different countries, across six continents, with 23.29% participants possessing citizenship from a North American country; 5.50% participants possessing citizenship from South American country; 16.51% participants possessing citizenship from a European country; 9.17% participants possessing citizenship from an African country; and 23.39% participants possessing citizenship from an Asian country. (See Table 2 below for participant citizenship.)

**Table 2**

*Participant Citizenship*

Continent *	n	%	Continent*	n	%
North America	51	23.39%	Africa	20	9.17%
Canada	7		Botswana	4	
USA	44		Egypt	2	
South America	12	5.50%	Jordan	2	
Argentina	1		Mauritius	1	
Brazil	1		Nigeria	1	
Chile	3		Mauritius	1	
Ecuador	1		South Africa	8	
Mexico	1		Uganda	1	
Peru	3		United Republic		

Continent *	n	%	Continent*	n	%
Uruguay	2		of Tanzania	1	
Europe	36	16.51%	Zimbabwe	1	
Austria	3		Asia	51	23.39%
Germany	2		Bangladesh	1	
Hungary	1		Cambodia	1	
Ireland	4		China	3	
Norway	1		Hong Kong	1	
Poland	1		India	24	
Portugal	1		Indonesia	1	
Spain	1		Japan	1	
Switzerland	2		Kazakhstan	1	
Turkey	1		Lebanon	2	
UK and Northern Ireland	19		Malaysia	1	
Australia	16	7.33%	Pakistan	8	
Australia	13		Philippines	2	
Fiji	2		Saudi Arabia	1	
New Zealand	1		Singapore	2	
			Syrian Arab Republic	2	
			Missing Data	31	14.22%

\* Islands categorized by closest continent, n=218

The sample was 82.3% women and 5.2% men, with a mean age of 40.96 (SD=8.57). Participants had a wide variety of teaching and IB experience, ranging from new teachers to veterans with more than 30 years' experience. In addition, 32.7% of the sample had a bachelors' degree or equivalent and 54.5% had a Masters' degree or equivalent (see Table 3 for sample demographic characteristics).

**Table 3***Sample Demographic Characteristics*

Identified Gender			Years Teaching Overall		
Male	11	5.20%	0-5	23	10.56%
Female	175	82.90%	6-10	53	24.31%
Non-Binary	0	0.00%	11-15	34	15.60%
Missing	24	11.40%	16-20	32	14.68%
Age			21-25	22	10.09%
25-30	25	11.47%	26-30	14	6.42%
31-35	30	11.76%	31+	5	2.29%
36-40	35	16.06%	Missing Data	27	12.80%
41-45	36	16.51%	Years Teaching within IB		
46-50	36	16.51%	0-5	89	40.83%
51-55	16	7.34%	6-10	59	27.06%
55+	6	2.75%	11-15	26	11.93%
Missing Data	27	12.8%	16-20	8	3.67%
Highest Education Level			21+	1	.46%
Bachelors	69	32.7%	Missing Data	28	13.30%
Master's Degree	115	54.50%			
PhD	0	0.00%			
Other	3	1.40%			
Missing Data	24	11.4%			

n=211

Of the sample, 77.3% reported experience teaching a class that contained students with dyslexia, with 12.8% of the sample reporting no experience teaching students with dyslexia in any format (See Table 4 for experience teaching students with dyslexia).

**Table 4***Experience Teaching Students with Dyslexia*

	n	%
I have never taught a student with dyslexia	27	12.8%
I have taught classes with some students with dyslexia	142	67.3%
I have taught special classes for students with dyslexia	17	8.1%
I have taught small group, specialized reading sessions for students with dyslexia	47	22.3%

n=218

## Instruments

IB YP teachers completed a three-part online survey using Qualtrics (Qualtrics, 2020). The survey was designed based Ecological Systems Theory (Bronfenbrenner, 1994; Bronfenbrenner & Morris, 2006; Ettekal & Mahoney, 2016). I attempted to analyze all of Bronfenbrenner's systems in order to determine the multifaceted and interactive effects of personal and environmental factors that impact teachers (Zavelevy & Lishchinsky, 2020). IRB participant informed consent was obtained as the first part of the survey (Appendix A). Participants were informed that the survey could be completed anonymously. They were provided information on the study including: purpose, contact information, risks, and benefits. Measures to ensure confidentiality were described.

The next part of the survey was a set of researcher-generated questions called, *Survey of Teacher Experiences and Perceptions of Dyslexia* (Appendix B). This survey assessed teacher perceived factors that might influence dyslexia services including teacher training, policies and funding, and definitions and labelling. These factors included all of Bronfenbrenner's systems in Ecological Systems Theory. For example, teacher training could be considered the microsystem. Policies and funding included both exosystem (school policies/funding) and macrosystem (IB policies). Definitions and labelling crossed all the systems.

Items in the *Survey of Teacher Experiences and Perceptions of Dyslexia* were modeled after Buell's study (1999) that analyzed teacher perceptions of programmatic factors necessary for inclusion. The perceptions were analyzed using a yes/no format. Teachers were asked if a factor was present, and if they needed this factor to successfully educate students with dyslexia. This yes/no method generated four possible answers for

every two items—I have/need; I have/do not need; I do not have/need; and I do not have/do not need. Items that participants answered as do not have/need were considered educational barriers: items that participants answered as have/need, do not have/do not need, and do not have/do not need were not considered barriers to student learning. Two questions were excluded from this analysis. These questions were question number 10 (*The country where my school is located has a national policy and/or laws on how to help students with special needs, including but not limited to issues like dyslexia and/or reading difficulties*) and question number 11 (*students can be declined entrance to your school because of academic abilities, including but not limited to dyslexia*). Questions 10 and 11 were used to provide more information on potential barriers: they were not part of analyzing the need/have four-square matrix.

Confirmatory Factor analysis was completed with these barriers (See Table 5 for Factor Loading). The barriers loaded onto two factors that could be labelled *Educational Supports* and *Special Education Labels*.

**Table 5**

*Factor Loading Matrix for Barriers Identified on the Survey of Teacher Experiences and Perceptions of Dyslexia*

Barriers	Factors	
	1	2
1. Access to support personnel	<b>.51</b>	.43
2. Dyslexia label used	.33	<b>.58</b>
3. School specific guidelines and procedures regarding how to help students with reading difficulties.	<b>.62</b>	-.13
4. Classroom teachers have specialized training for dyslexia.	<b>.63</b>	-.30
5. Teachers have shared definition of dyslexia.	<b>.55</b>	-.29
6. School uses special education labels	.22	<b>.50</b>
7. I have specialized dyslexia training.	<b>.54</b>	.13
8. School has specialized, high quality materials and resources for dyslexia.	<b>.68</b>	.08

	Factors	
9. The IB has specific policies and guidelines to support students with dyslexia.	.33	-.64

n=211

Reliability was only .26 on the Special Education Label factor, and .64 on Educational Supports. Due to this this low reliability with the Special Education Label factor, I decided to keep all the barriers together for analysis. The Cronbach's Alpha for the entire barrier scale was .63.

The third part of the survey was the *Knowledge and Beliefs about Developmental Dyslexia Scale (KBDSS)* (Soriano-Ferrer & Echegaray-Bengoa, 2014; Soriano-Ferrer et al., 2016). This final part of the survey focused on the microsystem within Ecological Systems Theory. The goal was to identify individual teacher perspectives and knowledge on dyslexia. This 36-item true/false/don't know scale (Appendix C) analyzed teacher knowledge and beliefs regarding developmental dyslexia.

This scale was chosen because it could gather a great deal of information about knowledge and beliefs on dyslexia in a short amount of time. On each item, teachers read a statement and identified if it was true or false. If the teacher did not know, they checked "do not know." The scale allowed the researcher to differentiate what teachers didn't know from their misconceptions about dyslexia (Soriano-Ferrer et al., 2016). Answers were categorized into *correct responses*, *incorrect responses*, and *don't know responses*.

Using exploratory factor analysis, I found that all 36 items loaded onto one KBDSS scale. The Cronbach's alpha for this new variable was .81— a higher internal reliability than .76, which was what Soriano-Ferrer identified with their participants in 2016 (Soriano-Ferrer et al., 2016).



The final part of the survey (Appendix D), modelled after the demographic data taken by Najakowska (2018), assessed teacher country of origin, country of current employment, presence/lack of special education national policy in this country, education level obtained, years teaching, current job description, and amount of experience teaching students with dyslexia.

### **Procedures**

Prior to giving the survey to teachers, it was pilot-tested with three PhD literacy students in order to determine the length of testing and whether participant fatigue was an issue. These trial subjects reported that the survey took approximately 10 minutes, so no changes were made.

Then, I placed a request for participation with four IB PYP Teacher Facebook groups (PYP Teachers - *let's share some ideas*, 20,021 members; IB PYP Teachers *let's share our daily experience*, 9,363 members; PYP Online Collaboration, 11,507 members, and PYP *coordinator group*, 3,882 members) using my personal Facebook account. Research by Baltar and Brunet (2012) suggested that using a personal account for online survey design increased participation as it increased participant confidence. A direct link to the survey, along with a few short sentences, an infographic, and weblink to more information was posted. Willing PYP IB teachers were asked to recruit other PYP IB teachers in their network.

Next, an IB-PYP-global-curriculum-development manager tweeted out information about the study, inviting PYP teachers to participate on two IB platforms (IB PYP Twitter Account, 27,200 Followers; IB PYP LinkedIn Group, 7,130 Members). Willing IB-PYP teachers were asked to recruit other Primary Years IB teachers in their

network. From these initial social media contacts, participants referred me to other contacts, which included listservs and global organizations. As a result, I placed information about the study on listservs, which included the following: USA-based Spell Talk; Australian-based DDoll; and the Global Issues Listserv for the American Speech-Language-Hearing Association. Organizations such as the Asian SENIA network, Texas IB schools, IB Asia, and the Association for Central European Schools (ACES) were also contacted based on participant referrals. In addition, I followed up with social media postings for two months on a variety of social media sites including Facebook IB PYP groups, LinkedIn, and Twitter.

### **Data Analysis Plan**

Ecological Systems Theory was also used to frame data analysis, as it examined various factors that restricted student access to educational opportunities. SPSS software was used to analyze all results (IBM Corporation, 2013). Before analysis, data was checked and cleaned. To address the first research question (*What do IB teachers know about dyslexia in the domains of general information, symptoms, diagnosis, and treatment?*), descriptive data from the *Knowledge and Beliefs about Developmental Dyslexia Scale* (Soriano-Ferrer & Echegaray-Bengoa, 2014; Soriano-Ferrer et al., 2016) was presented, including percentages of correct responses, incorrect responses, and don't know responses.

To answer the second research question (*What are some barriers that influence education of students with dyslexia within the IB classrooms?*), descriptive statistics were analyzed for the *Survey of Teacher Experiences and Perceptions of Dyslexia*, including frequency data for participant responses and the amount of missing data.

Next, questions one through nine on parts one and two of the *Teacher Experiences and Perceptions of Dyslexia* survey were paired. Questions on part two analyzed teacher-perceived need, whereas similarly numbered questions on part one analyzed whether teachers felt that they possessed the described knowledge, resources, or skills. Then, the paired question was analyzed to identify need/have, need/do not have, do not have/do not need, and have/do not need.

Following question pairing, educational barriers were identified. Educational barriers were defined as areas in which teachers stated that they needed a resource, a skill or a piece of knowledge. For example: question one on part two stated that “having reading support personnel improves educational outcomes for students with reading problems” and was paired with question one on part one that read “my school has access to support service personnel to help students with reading difficulties, including dyslexia.” If a teacher answered *yes* on part two, question one, and *no* or *I don't know* on part one, question one, the answers together would constitute need/do not have. The need/do not have response was categorized as an educational barrier. By contrast, if a teacher answered *yes* on part two, question one, and *yes* on part one, question one, the answers together would constitute need/have. The need/have response was not categorized as an educational barrier. Frequency data was presented for *educational barriers* which included do not have/need, and *not-an-educational barrier*, which included have/need, do not have/do not need, and have/need.

To answer the two-part third question (*How does teacher knowledge, including knowledge about dyslexia as well as overall teacher-education level, predict perceived barriers of working with students with dyslexia?*), several regressions were completed.

First, the connection between teacher dyslexia-knowledge and overall number of perceived barriers was analyzed by using an ordinary-least-squares-linear regression. The independent, continuous variable was the participant-summed-raw scores from the *Knowledge and Beliefs about Developmental Dyslexia Scale (KBDDS)*. The dependent variable was the number of educational barriers each participant identified on the *Teacher Experiences and Perceptions of Dyslexia* survey. As described in the second research question, each pair of items from the *Teacher Experiences and Perceptions of Dyslexia* survey was categorized as either an educational barrier or not-an-educational barrier. For each participant, the sum total of identified educational barriers was combined to create a new, continuous variable for each participant, which was labeled *sum educational barriers*. Cronbach's alpha for this new variable was .63.

The purpose of the regression was to determine if the independent variable was a significant predictor of the dependent variable (Huck, 2012). For example, as teacher knowledge of dyslexia (independent variable) increased, did participants report a higher number of educational barriers on the *Teacher Experiences and Perceptions of Dyslexia survey*? Initially years of experience teaching was included as a covariate in the analysis, but it was removed as it was found to not be significantly related to barriers.

Then, in order to further analyze the impact of teacher dyslexia knowledge on barriers, binary logistic regressions were conducted with each individual barrier as the dependent variable and the score on the KBDDS as the independent variable. A barrier was defined as an item where teachers stated need/do not have on the *Teacher Experiences and Perceptions of Dyslexia* survey. Items categorized as do not need/do not have, need/have, and do not need/have were placed into the category not barriers. The

goal of the logistic regression was to determine whether the independent variable scores could be used to discuss the explanatory or predictive power of the dependent variables using the concepts of odds (Huck, 2012). For example, as teacher knowledge (independent variable) increased, what was the likelihood that teachers would perceive a lack of special education funding as being a barrier, as measured by do not have/need on the *Teacher Experiences and Perceptions of Dyslexia* survey.

In order to investigate the second part of research question three, the impact of teacher education level on perceived barriers, the same procedures were followed. First, the highest level of teacher education was recoded into a binary categorical variable. Participants who held secondary school and bachelor's degrees were coded together, resulting in 32.7% of the sample. Then, Masters and PhD degrees, which were 55.9% of the sample, were categorized together. Next, an ordinary least squares linear regression was completed with the binary teacher education level as the independent variable and the sum educational barriers as the dependent variable. Finally, independent binary logistic regressions were completed with each separate barrier as a dependent variables and teacher education as the independent variable. For example, if teachers held a masters or PhD degree, how did this impact the likelihood of them reporting that lack of specific IB special education guidelines was a barrier?

## CHAPTER IV

### RESULTS

#### Research Question One

To answer research question one “What do IB teachers know about dyslexia in the domains of general information, symptoms/diagnosis, and treatment of dyslexia?” descriptive data from the *Knowledge and Beliefs about Developmental Dyslexia Scale* (Soriano-Ferrer & Echegaray-Bengoa, 2014; Soriano-Ferrer et al., 2016) was analyzed. Using Ecological Systems Theory to guide the results, these questions fall within the microsystem level (Bronfenbrenner, 1994; Bronfenbrenner & Morris, 2006; Ettekal & Mahoney, 2016). The goal was to identify individual skills and knowledge of the teachers. Table six displays the frequency counts for correct, incorrect, and do not know answers.

IB PYP teachers were mostly in agreement about some aspects of dyslexia. For example, 96.2% believed dyslexia exists, 95.2% reported that children with dyslexia are not just lazy, and 92.5% answered that giving accommodations is not unfair to students with dyslexia. On the other hand, teachers also had a variety of misconceptions about the cause/symptoms, diagnosis, and treatment of dyslexia. For example, 59.7% of participants incorrectly reported that dyslexia was caused by visual perceptual problems, 47.3% falsely stated that reversing letters was the main symptom of dyslexia, and 47.1% reported that they didn't know if problems establishing laterality was a symptom of dyslexia. 31.9% of participants either didn't know or didn't think dyslexia was a neurologically based disorder and 45.7% didn't know if dyslexia was hereditary.

In terms of diagnosis, 60.7% of participants correctly stated that administering individualized tests could be helpful in diagnosing dyslexia. However, 65.2% falsely said that intelligence tests were not useful in diagnosing dyslexia. There were also many misconceptions in the area of treatment. Forty-four percent of participants incorrectly reported that color overlays could help students with dyslexia while another 32.8% said they weren't sure if color overlays could help. While 80.7% of participants correctly reported that structured, sequential direct instruction in basic skills and learning was needed, many didn't know exactly what this entailed. For example, 47.1% did not know if multisensory instruction was important to treat dyslexia. Of the participants, 32.1% either didn't know or didn't think phonological awareness training was helpful in treating dyslexia.

**Table 6**

*Knowledge and Beliefs about Developmental Dyslexia Scale*

Question	Correct	Incorrect	Don't Know
1. I think dyslexia is a myth, a problem that does not really exist. (False)*	96.2%	.5%	3.2%
2. Children with dyslexia are not lazy or unintelligent. Being knowledgeable about dyslexia can help them. (True)	95.2%	1.1%	3.8%
3. A child can be dyslexic and gifted. (True)	95.2%	0%	4.8%
4. Giving students with dyslexia accommodations such as extra time on tasks, shorter spelling lists, special seating close to the teacher, etc., is unfair to other students. (False)	92.5%	3.8%	3.8%
5. All poor readers have dyslexia. (False)	94.1%	2.7%	3.2%
6. People with dyslexia have below-average intelligence. (False)	94.1%	1.1%	4.8%
7. Students with dyslexia need structured, sequential, direct instruction in basic skills and learning strategies. (True)	80.7%	9.1%	10.2%
8. Students with dyslexia often read with inaccuracy and lack of fluency. (True)	80.1%	12.4%	7.5%
	79.0%	9.7%	11.3%

9. Children with dyslexia tend to be poor spellers. (True)	78.1%	3.7%	18.2%
10. Physicians can prescribe medications to help students with dyslexia. (False)	78.0%	1.6%	20.4%
11. Intervention programs that emphasize phonological aspects of language with letters as visual support are effective for students with dyslexia. (True)			
12. Most teachers receive specific training to work with dyslexia children. (False)	76.6%	15.2%	8.2%
13. Difficulty with phonological processing of information is one of the major deficits of dyslexia. (True)	76.5%	5.9%	17.6%
14. Dyslexia is a neurologically based disorder. (True)	72.6%	7.0%	20.4%
15. Techniques involving repeated readings of materials (e.g., words, sentences or texts) help to improve reading and fluency. (True)	71.9%	14.6%	13.5%
16. Many students with dyslexia have low self-esteem. (True)	69.2%	17.3%	13.5%
17. Children with dyslexia have problems with decoding and spelling, but not with listening comprehension. (True)	68.8%	15.1%	16.1%
18. Generally, children with dyslexia have problems with phonological awareness (e.g., the ability to hear and manipulate sounds in language). (True)	67.9%	18.7%	13.4%
19. Dyslexia is characterized by difficulties in learning to read fluently. (True)	67.2%	19.9%	12.9%
20. Dyslexia usually lasts a long time. (True)	64.5%	8.6%	26.9%
21. The brains of people with dyslexia are different from those of people without dyslexia. (True)	61.3%	19.9%	18.8%
22. Administering an individual reading test is essential in diagnosing dyslexia. (True)	60.7%	16.4%	23.0%
23. Many students with dyslexia continue to have reading problems as adults. (True)	59.5%	23.2%	17.3%
24. Modelling fluent reading is often used as a teaching technique. (True)	58.2%	17.4%	24.5%
25. Dyslexia is hereditary. (True)	51.1%	19.9%	29.0%
26. Most studies indicate that about 5% of school-age students have dyslexia. (True)	43.5%	10.8%	45.7%
27. Reversing letters and words is the main characteristic of dyslexia. (False)	41.0%	47.3%	11.7%
28. Multisensory instruction has been shown to be an ineffective teaching method for treating dyslexia. (False)	38.8%	34.2%	27.8%
	38.5%	14.4%	47.1%



29. Dyslexia is more frequent in males than in females. (True)	36.8%	41.1%	22.2%
30. Dyslexia refers to a relatively chronic condition that usually cannot be completely overcome. (True)			
31. Problems in establishing laterality (body schema) are the cause of dyslexia. (False)	35.3%	11.4%	47.1%
32. Dyslexia is caused by visual perception deficits resulting in reversals of letters and words. (False)	29.6%	59.7%	10.8%
33. Most children with dyslexia usually have emotional and/or social problems. (True)	29.4%	48.7%	21.9%
34. Children with dyslexia can be helped by using colored lenses/overlays. (False)	22.6%	44.6%	32.8%
35. Students who have reading disabilities without an apparent cause (e.g., intellectual disabilities, absenteeism, inadequate instruction...) are referred to as dyslexic. (True)	19.4%	57.0%	23.7%
36. Intelligence tests are useful in identifying dyslexia. (True)	17.1%	65.2%	17.6%

*\*Parentheses identify correct and incorrect answers. n=186*

## Research Question Two

Data from 210 teacher-responses on the *Teacher Experiences and Perceptions of Dyslexia Survey* was analyzed to answer research question two, “what are some barriers that influence education of students with dyslexia within the IB classroom?” This research question crosses all of Brofenbrenner’s interdependent systems in Ecological Systems Theory. Some of the barriers looked specifically at teacher activities and roles, which would be considered the microsystem (Brofenbrenner, 1979). Other barriers analyzed school-wide issues, which could be considered the mesosystem. Finally, other analyses looked at IB-wide and cultural issues, which is considered the exosystem or macrosystem. While Brofenbrenner classifies each of these as separate, many of the barriers, such as special education labelling cross boundaries.

Of all the participants, only 33.6% of participants reported that the country where their school was located possessed national policies and/or laws to help students with

special needs. Of all respondents, 30.8% reported that their school's country did not have special education policies/laws, and 33.7% of participants stated that they were not sure if a national policy existed. While the International Baccalaureate encourages schools to include all students (International Baccalaureate, 2016), twenty-three percent of participants reported that students could be declined entrance to their school as a result of academic abilities.

Table seven includes frequency data from part one of the *Teacher Experiences and Perceptions of Dyslexia Survey* that analyzed whether teachers reported that they have access to various supports, skills, policies, and special education labels. While 74.9% of respondents stated that their school used labels (i.e., special needs, special education, learning disabled, autism, dyslexia) to describe some students' academic needs, only 33.5% stated that the teachers in their school had an agreed-upon shared definition of dyslexia. Even though the IB states that schools should develop learning plans for students, only 50.2% of participants reported that their schools have guidelines and procedures how to do this. Furthermore, 47.8% of respondents stated that they were unsure if the IB had policies to support students with dyslexia. While 71.6% of respondents stated that their school had access to support service personnel to help students, only 17.1% of participants stated that teachers had any specialized training.

**Table 7***Responses on Teacher Experiences and Perceptions of Dyslexia Survey: Have*

<b>Part One Questions</b>	Yes	No	Don't Know
1. My school has access to support service personnel to help students with reading difficulties, including dyslexia.	71.6%	21.3%	6.6%
2. Some students at my school are identified as dyslexic.	75.4%	7.6%	16.1%
3. My school has specific guidelines and procedures regarding how to help with students with reading difficulties.	50.2%	39.3%	10.0%
4. Classroom teachers in my school have specialized training to help students with reading difficulties, including dyslexia.	17.1%	74.2%	8.6%
5. Teachers in my school have a shared definition of the word dyslexia.	33.5%	53.1%	13.4%
6. My school uses labels (i.e. special needs, special education, learning disabled, dyslexic, autism, dyslexia, ADHD) to describe some students' academic difficulties.	74.9%	21.8%	.9%
7. In order to help students with dyslexia, I have specialized training.	34.0%	65.1%	1.0%
8. My school has specialized, high-quality material resources to help students with reading difficulties, including dyslexia.	33.8%	55.7%	10.5%
9. The International Baccalaureate has specific policies and guidelines to support students with dyslexia.	24.9%	27.3%	47.8%
10. The country where my school is located has a national policy and/or laws on how to help students with special needs, including but not limited to issues like dyslexia and/or reading difficulties.	35.6%	30.8%	33.7%
11. Students can be declined entrance to your school because of academic abilities, including but not limited to dyslexia.	23.4%	61.7%	14.8%

n=210

Table 8 displays data that analyzed teacher perceived need of the supports, skills and special education labels described in part one of *Teacher Experiences and Perceptions of Dyslexia Survey*. Only 28.2% of respondents stated that they felt completely prepared to help students with dyslexia. Of respondents, 71.1% stated that they did not feel that the International Baccalaureate policies and guidelines to support students with dyslexia were adequate. Meanwhile, 92.8% of respondents reported that school-wide policies and guidelines that describe how to help students with reading

difficulties improve educational performance, 75.1% of teachers felt a specific label of dyslexia impacts educational services, with 88% stating that a shared definition is important. Sixty-nine percent of teachers answered that special education labels, in general, help provide quality educational services to children.

**Table 8**

*Responses on Teacher Experiences and Perceptions of Dyslexia Survey: Need*

<b>Part Two Questions</b>	Yes	No
1. Having reading support service personnel improves educational outcomes for students with reading problems, including dyslexia.	96.7%	2.9%
2. A specific label of “dyslexia” impacts the educational services that a student receives.	75.1%	24.9%
3. School-wide specific policies and guidelines that describe how to help students with reading difficulties improves education for students.	92.8%	7.2%
4. Classroom teachers at my school have adequate specialized training to help students with reading difficulties, including dyslexia.	17.3%	82.7%
5. Having an agreed-upon definition of dyslexia improves educational services.	88.0%	12.0%
6. A special education or special needs label (i.e. special needs, special education, learning disabled, dyslexic, autism, dyslexia, ADHD) helps provide quality educational services to a child.	69.2%	30.8%
7. I feel completely prepared to help students with dyslexia in my school.	28.2%	71.8%
8. Specialized high-quality material resources for students with reading problems, including dyslexia, improves educational outcomes for these students.	95.2%	4.8%
9. The International Baccalaureate policies and guidelines to support students with dyslexia are adequate.	28.9%	71.1%

n=210

To further analyze results, each question on the *Teacher Experiences and Perceptions of Dyslexia survey* was paired. Questions on part two analyzed teacher need of a particular skill, knowledge, or resource, while questions on part one analyzed whether teachers possessed this same skill, knowledge or resource. Paired items where teachers reported that they needed a particular skill, resource, knowledge or support, but

did not have it were labelled *educational barriers*. Table nine presents frequency counts for educational barriers for all the paired items.

**Table 9**

*IB Teacher-Perceived Educational Barriers to Instructing Students with Dyslexia*

Question Pair	Educational Barrier	Not a Barrier
Classroom teachers possess adequate training	74.9%	25.1%
Specialized school materials for dyslexia	62.1%	37.9%
Adequate personal training	59.7%	40.3%
IB has policies and guidelines to adequately support students with dyslexia	59.7%	40.3%
Teachers have shared definition of dyslexia	58.8%	41.2%
School has educational guidelines and policies to help students with dyslexia	44.1%	55.9%
Access to support services	25.6%	74.4%
Label of dyslexia used at school	17.5%	82.5%
Educational labels used at school to describe disabilities	13.3%	86.7%

n=211

Lack of adequate teacher preparation to help students with dyslexia was the greatest perceived barrier. 74.9% participants reported that lack-of-general-education-staff-dyslexia training posed a barrier: only 21.07% of participants reported that their classroom teachers have adequate preparation to help students with dyslexia. Lack of personal training for dyslexia also created a barrier for 59.7% of participants. When further analyzed, only 34% of the participants reported that they personally had adequate training to help students with dyslexia.

Lack of specialized school materials was another frequently perceived barrier. 62.1% participants reported that they needed specialized materials but did not have them. By contrast, access to support personnel was not a perceived barrier, with 82.5% of respondents stating that access to support personnel to help students with dyslexia was

not a barrier. Further analysis revealed that 72.2% of schools already had specialized support personnel to help students with dyslexia. 97.1% of participants reported that this support is needed.

Lack of IB policies and guidelines posed another perceived barrier to instruction for 59.7% of participants. When further analyzed, only 28.7% felt that no specific IB policy for special education was needed, while 69.2% felt it was needed. Several paired questions analyzed the use of special education labels. Question two specifically analyzed whether or not schools used the specific label of dyslexia. Seventy six percent of participants responded that their school already used the label of dyslexia for their students, and 82.5% of participants reported that having access to a label of dyslexia was not a barrier. However, on question five, 58.8% teachers reported that the lack of a shared teacher definition of the label dyslexia did present an educational barrier.

Several paired questions analyzed the use of special-education labels. Question two analyzed whether or not schools used the specific label of dyslexia. 76% of participants responded that their school already used the label of dyslexia for their students, and 82.5% of participants reported that having access to a label of dyslexia was not a barrier. However, on question five, 58.8% of teachers reported that the lack of a shared-teacher definition of dyslexia did present an educational barrier.

Questions six on parts one and two analyzed the use of special-education labels in general. In part one of the survey, question six assessed whether participants' schools used labels such as special needs, special education, learning-disabled, autism, dyslexia, and ADHD to describe students' learning difficulties. 80% of teachers reported that their schools already used labels. Question six in part two asked whether teachers found these

labels necessary to help provide quality educational services to children. 70% percent of participants reported that special-education labels are necessary to improve services for students with special-education needs. Only 9% of participants replied that their school did not use labels: those participants did not think labels were necessary. As a result, use of educational labels in general created a barrier for 13.3% of participants.

### **Research Question Three**

To answer the two-part research question three, an ordinary-least-squares-linear regression was first conducted to assess whether teacher knowledge about dyslexia predicted the overall number of perceived barriers for working with students with dyslexia. This research question analyzed the interconnection of all the systems within Ecological Systems Theory (Bronfenbrenner, 1994; Bronfenbrenner & Morris, 2006; Etekal & Mahoney, 2016). Teacher knowledge could be considered the microsystem level. Then, analyses were conducted to determine if teacher knowledge within the microsystem influenced barriers across all the other systems. The independent variable was the summed raw score from correct teacher responses, as measured by the *Knowledge and Beliefs about Developmental Dyslexia Scale (KBDDS)*. The dependent variable was the number of educational barriers identified on the *Teacher Experiences and Perceptions of Dyslexia* survey. Results are found in Table 10 below. No statistically significant relationship was found.

**Table 10**

*Results from Linear Regression Analysis Examining how KBDSS Scores Relate to Perceived Number of Educational Barriers*

Predictor	Coefficient	SE	p-value
Summed Score of KBDSS	.598	.071	.063

\* $p < 0.05$ ;  $N = 211$ ;  $R^2 = .021$

To further analyze research question three and determine if knowledge of dyslexia predicted quality of perceived barriers, binary logistic regressions were completed with each barrier. Given that I hypothesized that more knowledge of dyslexia would lead to increases in some barriers and decreases in others, additional analyses were conducted to test this. Similar to the first part of this question, this second part of the question also looked to see if teacher knowledge within the microsystem of Ecological Systems Theory influenced barriers across all the other systems. The independent variable was again the sum of raw scores from the KBDSS. The dependent variables were the binary *educational barrier* or *not barrier* identified from the Teacher Experiences and Perceptions of Dyslexia Survey. Results are found in Table 11. A statistically significant relationship was found between KBDSS score and perceived educational barrier for adequate personal dyslexia training,  $\chi^2(1) = 21.53$ ,  $p < .000$ . Increasing the score on the KBDSS by 1 was associated with a 14.3% decrease in the likelihood that teachers identified their own personal lack of dyslexia training as a barrier to educating students (odds ratio = .857). There were no statistically significant relationships identified between KBDSS score and the other barriers.



**Table 11**

*Results from Binary Logistic Regression Analyses Examining how KBDSS Scores Relate to Perceived Number of Educational Barriers*

Barriers	Access to Support Services	Label of Dyslexia Used	School Guidelines	Classroom Teacher Dyslexia Training	Teacher Shared Definition Dyslexia
	Coef./OR (SE)	Coef./OR (SE)	Coef./OR (SE)	Coef./OR (SE)	Coef./OR (SE)
KBDSS Sum Score	-.04/.98 (0.32)	-.01/.99 (.04)	.023/1.02 (.03)	-.07/.94 (.04)	-.01/.99 (.03)
Barriers	School Uses Labels	Personal Dyslexia Training	Specialized School Materials	IB Policies for Dyslexia Adequate	
	Coef./OR (SE)	Coef./OR (SE)	Coef./OR (SE)	Coef./OR (SE)	
KBDSS Sum Score	-.04/.97 (.041)	-.16/.86 (.04)*	-.05/.95 (.03)	.04/1.04 (.03)	

\*p<0.05; N= 211, OR=odds ratio

In order to explore whether teacher education levels influenced perceived number of barriers, first an ordinary least squares linear regression was completed. The independent variable was a teacher education level, coded into a binary option of secondary school/bachelors or masters/PhD. The dependent variable was sum number of educational barriers. As displayed in Table 12, no statistically significant relationship was identified between teacher education level and for the sum total of educational barriers. However, it was approaching significance.

**Table 12**

*Results from Linear Regression Analysis Examining How Teacher Education Relates to Perceived Number of Educational Barriers*

Predictor	Coefficient	SE	p-value
Binary Teacher Education Level	-.508	.30	.094

\* $p < 0.05$ ;  $N = 186$ ;  $R^2 = .015$

In order to further explore whether more teacher education predicted the likelihood of increases or decreases to some barriers, additional logistic regressions were completed. Table 13 displays the results.

**Table 13**

*Results from Binary Logistic Regression Analyses Examining How Overall Teacher-Education Level Relates to the Perceived Number of Educational Barriers*

Barriers	Access to Support Services	Label of Dyslexia Used	School Guidelines	Classroom Teacher Dyslexia Training	Teacher Shared Definition Dyslexia
	Coef./OR (SE)	Coef./OR (SE)	Coef./OR (SE)	Coef./OR (SE)	Coef./OR (SE)
Teacher Education Level	-.08/.92 (0.35)	.36/1.48 (.41)	-.22/.80 (.31)	-1.32/.27 (.45)*	-.13/.87 (.31)
Barriers	School Uses Labels	Personal Dyslexia Training	Specialized School Materials	IB Policies for Dyslexia Adequate	
	Coef./OR (SE)	Coef./OR (SE)	Coef./OR (SE)	Coef./OR (SE)	
Teacher Education Level	-18.27/.90 (.46)	1.16/.31 (.34)*	-.03/1.03 (.32)	.02/1.01 (.31)	

\* $p < 0.05$ ;  $N = 186$ , OR=odds ratio

Two statistically significant relationships were identified. As participant education level increased from secondary school/bachelors to masters/PhD, the likelihood

that participants identified lack of adequate training as a barrier decreased. First, the logistic model that analyzed whether lack of classroom teacher preparation was a barrier was statistically significant,  $\chi^2=10.44$ ,  $p<.001$ . Having a master's degree or higher was associated with a 73.2% decrease in the likelihood that teachers reported lack of proper training as a barrier for classroom teachers (odds ratio=.27). Likewise, the coefficient for increased barriers for personal preparation was also statistically significant  $\chi^2= 12.76$ ,  $p<.000$ . Having a masters' degree or higher was associated with a 68.8% decrease in the likelihood that participants reported lack of personal dyslexia training as an educational barrier for helping students with dyslexia (odds ratio=.31).

### **Summary**

Results for the first research question indicate that what IB teachers know about dyslexia is variable. The majority of participants, for instance, recognized that dyslexia is real and reported that accommodations for students with dyslexia are fair. On the other hand, there were also many misconceptions about dyslexia. Many research-participants erroneously believed that dyslexia is caused by visual problems. There were also other misconceptions about dyslexia's causes and treatments.

Analysis of research question two identified a number of potential barriers to educating IB PYP students with dyslexia. The most frequently reported barrier was lack of adequate teacher preparation. The next most reported barrier was lack of specialized school materials to help students with dyslexia. Participants also reported that lack of specific IB special-education policies and guidelines posed another barrier. Access to support personnel and special-education labels presented less of a challenge. Many

teachers reported that their schools use a specific label of dyslexia, and others reported that lack of a shared teacher definition of this word did present a barrier.

Research question three analyzed whether teacher knowledge, including knowledge about dyslexia and teacher education level, predicted perceived barriers of working with students with dyslexia. Neither teacher knowledge of dyslexia nor teacher education level created significantly more barriers to education. Increased teacher knowledge of dyslexia reduced the likelihood that teachers identified personal lack of dyslexia training as an educational barrier. As overall teacher education level increased, the likelihood that participants reported adequate training was a barrier to educating students with dyslexia also decreased.

## CHAPTER V

### DISCUSSION

#### Summary and Discussion

The International Baccalaureate (IB) school system encourages inclusion of all students through use of instructional approaches such as universal design for learning (Ralabate, 2011; Rose & Meyer, 2006), differentiation (International Baccalaureate, 2016; Tomlinson & Cunningham, 2003) and identification of barriers to instruction (International Baccalaureate, 2016). However, at this time there is limited research examining potential barriers to instruction for students with disabilities, in particular dyslexia. Thus, in this current study, I sought to provide preliminary insight into potential difficulties that IB Primary Years Program (PYP) teachers might be facing when instructing students with dyslexia using Ecological Systems Theory to frame the research (Bronfenbrenner, 1994; Bronfenbrenner & Morris, 2006). This chapter summarizes and discusses the study's findings in accordance with the research questions presented. Potential implications for educational practice are described. In addition, limitations and recommendations for further research are also included.

The first question of this research study analyzed what IB PYP teachers knew about dyslexia. This information could be considered the microsystem under Ecological Systems Theory. Despite reports that many countries in the world still consider dyslexia a myth (Cassidy et al., 2020; Mather et al., 2020), 96.2% of participants in this study reported that dyslexia does indeed exist, with 95.2% reporting that "children with dyslexia are not lazy or unintelligent. Being knowledgeable about dyslexia can help them." The IB organization calls IB PYP teachers to differentiate for students with special needs (International Baccalaureate, 2016). Results of this study indicate that a majority of IB PYP teachers believe in the merits of providing accommodations to students with dyslexia.

On the other hand, IB PYP teachers also had many misconceptions about dyslexia. In accordance with many past studies that have shown that teachers frequently attribute the cause of dyslexia to visual deficits (Hudson et al., 2007; Wadlington & Wadlington, 2005; Washburn et al., 2011, Yin et al., 2020), one of the most frequently reported misconception was that dyslexia is caused by visual perceptual problems, with 70.5% of teachers reporting that visual perceptual deficits, including letter reversals, cause dyslexia. An additional 77.4% of the participants incorrectly reported that color overlays either do or might help students with dyslexia. Even though neuroscientists have widely documented that dyslexia has both genetic and neurobiological markers (Becker et al., 2017; Fuchs et al., 2017; Eckert, 2004; Gialluisi et al., 2019), 45.7% of participants in this study didn't know if dyslexia was hereditary, and 31.9% of participants either didn't know or didn't think dyslexia was neurologically based.

It is also widely documented that dyslexia is a language-based disorder, which is characterized by poor phonological processing (Lyon et al., 2003; Snowling, 2000; Perfett et al., 2019; Torgeson et al., 1997; Vellutino et al., 2004. Wagner et al., 1997). While many participants in this study recognized that structured, sequential skills were needed to help students with dyslexia, 31.7% either reported that they didn't know if children with dyslexia had phonological problems or they didn't think this was a problem.

The second research question in this study analyzed IB PYP teacher-perceived barriers to instructing students with dyslexia. Results could be placed across all layers of the Ecological Systems Theory, as some barriers directly related to individual teachers, while other questions analyzed school-wide and IB/system-wide issues. Using a two-part survey, teachers were first asked to identify skills, policies, and knowledge that they have about dyslexia. Then, they were asked to identify their needs in the same areas. Using paired questions from both parts of the survey, barriers to instruction were identified

based on questions where teachers stated they needed a skill, policy, or knowledge, but did not have it.

Using Ecological Systems Theory as a guide to analysis (Bronfenbrenner, 1994; Bronfenbrenner & Morris, 2006; Ettekal & Mahoney, 2016), the most commonly identified barrier was at the microsystem level (Bronfenbrenner, 1979), or level of individual teacher. Of all participants, 74.9% reported that lack of classroom teacher knowledge about dyslexia created a barrier to instruction, with 71.8% of participants reporting that they themselves do not have adequate preparation to help students with dyslexia. This finding is in accordance with several past studies that have demonstrated teachers globally lack adequate training to help students with dyslexia (Knight, 2018; Mather et al., 2020; Soriano-Ferrer et al., 2016; Stark et al., 2016; Washburn et al., 2016; Washburn et al., 2017; Wong, 2020; Worthy et al., 2016; Yin, 2020; Zhao et al., 2016). This is problematic because if specific training is not available, learning from practice is often a major source of knowledge about dyslexia (Knight, 2018; Yin, 2020). With so many teachers reporting that treatments such as visual overlays helps students, lack of training perpetuates myths.

The next most common barriers were at the mesosystem level (Bronfenbrenner, 1979), or school-wide level. While 71.6% of participants reported that their school had access to support personnel to help students with reading difficulties including dyslexia, 95.2% stated that their schools did not possess specialized high-quality instructional material for students with dyslexia. As a result, lack of specialized school materials created the second most frequently reported barrier to instructing students with dyslexia. This finding is in accordance with recent studies by both Cassidy et al. (2020) and Mather (2020) that reported resources for dyslexia are not allocated equitably across countries. Another barrier reported by 44.1% of participants was lack of school educational guidelines and policies to help students with dyslexia. While the IB encourages schools to develop individualized learning plans for students (International Baccalaureate, 2016),

only 50.2% of participants reported that their schools actually has specific guidelines and policies for special education, with 92.8% reporting that specific guidelines and procedures are necessary to improve education for students with reading difficulties. This notion is supported by research that shows positive correlations between special education policies and student achievement (Schwartz et al., 2019; Hanushek et al., 2002)

At the macrosystem level (Bronfenbrenner, 1979) or greater community and cultural level, lack of specific IB special education policies created another barrier to instruction. At this time, the IB encourages schools to use concepts such as Universal Design for Learning (UDL) (International Baccalaureate, 2016; Rao et al., 2016) and differentiation (International Baccalaureate, 2016; Tomilson & Cunningham, 2003). However, there are no specific policies or guidelines for special education (Pletser, 2016). Instead, schools are encouraged to put the concepts of UDL and differentiation into practice by using the school context, culture, and national legislation from the school's country (IB Community Blog, 2019). However, 64.5% of participants either didn't know or didn't think the country where their school was located had any national policy. Furthermore, the IB states that all students should be included in instruction (IB Community Blog, 2019). However, 23.4% of participants reported that students can be denied entrance to their school as a result of academic abilities. Potentially as a result of these mismatches, 59.7% of participants reported that lack of specific IB policies and guidelines created a barrier to instruction for students with dyslexia, with over 71.1% of participants reporting that IB special education policies were not sufficient.

As a language-mediated, meaning making system, the concept of special education labels is highly influenced by culture (Agosto et al., 2017). As a result, special education labels intersect the micro, meso, and macrosystem levels. At this time, the IB does not recommend using special education labels (International Baccalaureate Community Blog, 2015). The concept of labelling is also controversial around the world, with some feeling that labels have negative repercussions (Boyle, 2007; Cuttler &



Ryckmann, 2018; Elliot 2020; Osterholm et al., 2007; Shifrer, 2013), and others reporting that labels support quality special education services (Gallagher, 1976; Gwernan-Jones & Burden, 2010; Lindstrom, 2019; Riddick, 2000) and increase recognition that dyslexia is a neurologically-based disorder (Centanni, 2020; Camilleri et al., 2020). In this study, participants generally viewed labels positively, with 70% of participants reporting that special education labels, including dyslexia, are necessary to improve services for students with dyslexia. In addition, 80% of participant schools already use some form of special education labels. However, 66.5% of participants reported that the teachers at their school either didn't share the same definition of dyslexia, or the participants didn't know if they were using the same definition. As a result, 58.8% of participants reported that lack of shared definition for dyslexia created an instructional barrier. With various organizations and countries defining dyslexia differently (Gabor, 2010; Mather et al., 2020), this lack of shared definition has also been documented as barrier for instruction in other educational settings (Broadbent, 2018; Wagner et al., 2019).

The final research question in this study analyzed if teacher knowledge, including knowledge about dyslexia and overall teacher education level, predicted the number and quality of teacher-perceived instructional barriers. As with the second research question, this information also crossed various layers of Ecological Systems Theory. Considering the success of any special education program often relies on the buy-in of skilled teachers (Yadav et al., 2015; Woodcock & Woolfson, 2019), it was important to determine if teachers with more knowledge and education viewed barriers differently than participants with less knowledge and education. Results from various regressions indicated that generally, teachers who knew more about dyslexia and/or had more advanced educational degrees, were no more likely to report an increase in overall number of educational barriers than the rest of the participants. However, having more knowledge about dyslexia reduced the likelihood that teachers identified lack of personal dyslexia training

as a barrier to educating students with dyslexia. In addition, having a masters' degree or higher was also associated with a decrease in the likelihood that participants reported lack of dyslexia training as an educational barrier. These findings are supported by past researchers who have shown that additional teacher training increases teacher confidence and skills in working with students with dyslexia (Echegaray-Bengoia et al., 2016; Knight, 2018).

### **Limitations**

While this study provided important descriptive information that was not previously known, it also had limitations. First, I used a combination of convenience and snowball sampling technique with several Facebook groups, Twitter, and an IB LinkedIn group. As a result, the participants may have represented a skewed sample of teachers who are concerned with dyslexia procedures at their school.

In addition, the geographical bounds of this type of sampling method were not well-drawn. While participants from across six continents and 52 different countries responded to the survey, some countries had more representation than others. I reported the demographic information in the study, in order to help readers consider the generalizability of the results.

Another limitation to this study was the methodological approach. This study took a purely quantitative approach to data collection. The KBDSS tool, for example, utilized a true/false/I don't know format. As a result, nuanced, qualitative explanations of surveyed barriers were not addressed in this particular study. In addition, there may have been other issues that create barriers to education that are not included in the utilized surveys. A further limitation included the research design. The methodology in this research included correlational design. As a result, cause and effect relationships cannot be assessed. Additionally, it is possible that only some of the relevant variables were measured and that the variables did not cause the other (Stangor, 2011).

## **Implications and Future Research**

In order to provide quality services to students with special needs, the IB system encourages schools to identify barriers to learning (IB Community Blog, 2019). If schools fail to identify and remove barriers, the IB states that inclusion can be impeded (International Baccalaureate Community Blog, 2019). At this time, there are only a few other studies analyzing special education supports and barriers within the IB system. A 2016 study by Rao identified that IB teachers need more time and knowledge to best implement the IB suggested practices of Universal Design for Learning. At the high school IB level, Dulfer (2019) similarly showed that IB diploma program teachers struggled with providing high quality inclusion supports. Chiller et al. (2016) also reported that lack of resources and support created barriers to inclusion within their study. The results of this study, supported by the results of these other studies, suggest that the International Baccalaureate should invest more resources into special needs professional development programs for teachers. This study also supports the idea that increased teacher education may result in teachers feeling more confident, and result in fewer barriers to instructing students with dyslexia. In addition, the IB system might consider re-examining their policies and guidelines for special education, as so many participants in this study reported that lack of specific policies created barriers for instructing their students with dyslexia.

Despite advocacy and international agreements going back decades, high quality education for students with disabilities continues to be a globally problematic area, with little change (Cassidy et al., 2020, Hernandez-Torrano, 2020; Kiru & Cooc, 2018). With schools in more than 158 countries worldwide, the IB is positioned to become a world

leader in modelling best practice policies for dyslexia. Increasing focus on teacher-dyslexia trainings, creating a shared definition of dyslexia, and outlining more specific policies to protect the rights of students with dyslexia might be first steps in this direction.

This study identified that IB PYP teachers lack knowledge and training about dyslexia. The teachers recognize that this is a need, and they feel that specialized training is important to help their students. As a result, it is suggested that future research analyze different methods for providing teacher dyslexia trainings.

This study also documented that IB PYP teachers feel the IB needs more structured policy and guidelines for students with special education. At the same time, many schools are already using some sort of policy. Future research might delve further into what specific policies and guidelines IB PYP teachers would find most helpful. For example, would providing an IB global shared definition bank for disabilities such as dyslexia, autism, ADHD, be sufficient? Or do IB PYP teachers want more specific protocols to follow in order to provide quality special education services? Another direction might be to explore the connection of currently used IB PYP student special education labels to the impact on student academic, social, and emotional success.

This study also showed that increased teacher knowledge of dyslexia and higher teacher education level both decreased the likelihood that teachers perceived adequate training as a barrier. A more thorough qualitative or mixed methods study might also analyze if these perceptions are accurate.

## APPENDIX A

### IRB Informed Consent

Are you an International Baccalaureate (IB) Primary Years Teacher (PYP)? If yes, I'm looking for your insights on students with dyslexia.

My name is Jennifer Preschern. I'm a past IB PYP teacher from the USA with over 20 years working with students with various learning needs. While teaching in an IB school, I wanted to know: How could I better support my PYP students with reading difficulties? On a bigger scale, how are other IB PYP teachers supporting students with dyslexia? I couldn't find adequate answers to these questions in educational research. Therefore, I decided to pursue a PhD myself in order to investigate. I hope that you will consider taking part in this survey research, which is part of my dissertation project at St. John's University in New York.

The goal of my study is to investigate places where we can improve educational services for students with dyslexia within our IB community.

Some information about this survey:

**1. It's anonymous.** Confidentiality of your research records will be strictly maintained.

No personal names, including school name, or other identifying information will be collected in this study. No internet user ID numbers will be collected.

**2. I will not try to sell you anything.** There are no known risks associated with your participation in this research beyond those of everyday life. You have the right to skip or not answer any questions you prefer not answer.

**3. The survey should take about 10 minutes.**

It has three parts:

- The first part seeks to uncover your feelings about services for students with dyslexia at your school.
- The second part is a scale developed by Soriano-Ferrer & Enchegaray-Bengoa (2016) called *Knowledge and Beliefs about Developmental Dyslexia Scale (KBDDS)*.
- The third part asks some questions about you. The demographic data will be used in the analysis of the results. For example, where is your school located? This will help identify any potential differences between countries.

**4. Unfortunately, I can't pay you for your time.** However, once you complete the study, I will provide you with answers to the KBDSS scale. I will also give you an internet link to a free online dyslexia professional development course.

If there is anything about the study or your participation that is unclear or that you do not understand, if you have questions or wish to report a research-related problem, please contact me:

Jennifer Preschern, Jennifer.preschern18@my.stjohns.edu or you can also contact my faculty sponsor, Kyle Cook, CookK@stjohns.edu

If you have any questions about your rights as a research participant, you can contact the University's Institutional Review Board, St. John's University, Dr. Raymond DiGiuseppe, Chair digiuser@stjohns.edu 718-990-1955 or Marie Nitopi, IRB Coordinator, nitopim@stjohns.edu 718-990-1440.

Thank you for your consideration. I hope we can work together to create the best possible supports for all our IB PYP students globally.

**Before you take the survey, I need your permission to use your answers on the survey in my research. If you agree to participate in this research, please click I AGREE.**

- I agree.
- I disagree.

APPENDIX B  
Survey of Teacher Experiences and Perceptions of Dyslexia

**These first questions ask about policy, services, and procedures at your school.**

1. My school has access to support service personnel to help students with reading difficulties, including dyslexia. *(Yes/No/Don't Know)*
2. Some students at my school are identified as dyslexic. *(Yes/No/Don't Know)*
3. My school has specific guidelines and procedures regarding how to help with students with reading difficulties. *(Yes/No/Don't Know)*
4. Classroom teachers in my school have specialized training to help students with reading difficulties, including dyslexia. *(Yes/No/Don't Know)*
5. Teachers in my school have a shared definition of the word dyslexia.  
*(Yes/No/Don't Know)*
6. My school uses labels (i.e., special needs, special education, learning disabled, dyslexic, autism, dyslexia, ADHD) to describe some students' academic difficulties.  
*(Yes/No/Don't Know)*
7. In order to help students with dyslexia, I have specialized training. *(Yes/No/Don't Know)*
8. My school has specialized, high-quality material resources to help students with reading difficulties, including dyslexia. *(Yes/No/Don't Know)*
9. The International Baccalaureate has specific policies and guidelines to support students with dyslexia. *(Yes/No/Don't Know)*
10. The country where my school is located has a national policy and/or laws on how to help students with special needs, including but not limited to issues like dyslexia and/or reading difficulties. *(Yes/No/Don't Know)*

11. Students can be declined entrance to my school because of academic abilities, including but not limited to dyslexia. *(Yes/No/Don't Know)*

**These questions ask for your personal opinion.**

1. Having reading support service personnel improves educational outcomes for students with reading problems, including dyslexia. *(Yes/No)*
2. A specific label of “dyslexia” impacts the educational services that a student receives. *(Yes/No)*
3. School-wide specific policies and guidelines that describe how to help students with reading difficulties improves education for students. *(Yes/No)*
4. Classroom teachers at my school have adequate specialized training to help students with reading difficulties, including dyslexia. *(Yes/No)*
5. Having an agreed-upon definition of dyslexia improves educational services. *(Yes/No)*
6. A special education or special needs label (i.e. special needs, special education, learning disabled, dyslexic, autism, dyslexia, ADHD) helps provide quality educational services to a child. *(Yes/No)*
7. I feel completely prepared to help students with dyslexia in my school. *(Yes/No)*
8. Specialized high-quality material resources for students with reading problems, including dyslexia, improves educational outcomes for these students. *(Yes/No)*
9. The International Baccalaureate policies and guidelines to support students with dyslexia are adequate. *(Yes/No)*



## APPENDIX C

### Knowledge and Beliefs about Developmental Dyslexia Scale (KBDDS)

Soriano-Ferrer, M., Echegaray-Bengoa, J., & Joshi, R. (2016)

1. Dyslexia is a neurologically-based disorder. **True**
2. Dyslexia is caused by visual perception deficits resulting in reversals of letters and words. **False**
3. A child can be dyslexic and gifted. **True**
4. Most children with dyslexia usually have emotional and/or social problems. **True**
5. The brains of people with dyslexia are different from those of people without dyslexia. **True**
6. Dyslexia is hereditary. **True**
7. Most studies indicate that about 5 % of school-age students have dyslexia. **True**
8. Dyslexia is more frequent in males than in females. **True**
9. Generally, children with dyslexia have problems with phonological awareness (e.g., the ability to hear and manipulate sounds in language). **True**
10. Modeling fluent reading is often used as a teaching technique. **True**
11. People with dyslexia have below-average intelligence. **False**
12. Students with dyslexia often read with inaccuracy and lack of fluency. **True**
13. Reversing letters and words is the main characteristic of dyslexia. **False**
14. Difficulty with phonological processing of information is one of the major deficits found in dyslexia. **True**
15. Intelligence tests are useful in identifying dyslexia. **True**
16. All poor readers have dyslexia. **False**
17. Children with dyslexia can be helped by using colored lenses/colored overlays. **False**
18. Physicians can prescribe medications to help students with dyslexia. **False**

19. Multisensory instruction has been shown to be an ineffective teaching method for treating dyslexia. **False**
20. Students who have reading disabilities without an apparent cause (e.g., intellectual disabilities, absenteeism, inadequate instruction) are referred to as dyslexic. **True**
21. Children with dyslexia are not lazy or unintelligent. Being knowledgeable about dyslexia can help them. **True**
22. Giving students with dyslexia accommodations, such as extra time on tasks, shorter spelling lists, special seating close to the teacher, etc., is unfair to other students. **False**
23. Intervention programs that emphasize phonological aspects of language with letters as visual support are effective for students with dyslexia. **True**
24. Most teachers receive specific training to work with dyslexic children. **False**
25. I think dyslexia is a myth, a problem that does not really exist. **False**
26. Techniques involving repeated reading of material (e.g., words, sentences or texts) help to improve reading fluency. **True**
27. Problems in establishing laterality (body schema) are the cause of dyslexia. **False**
28. Students with dyslexia need structured, sequential, direct instruction in basic skills and learning strategies. **True**
29. Dyslexia refers to a relatively chronic condition that usually cannot be completely overcome. **True**
30. Many students with dyslexia continue to have reading problems as adults. **True**
31. Many students with dyslexia have low self-esteem. **True**
32. Children with dyslexia have problems with decoding and spelling, but not with listening comprehension. **True**
33. Administering an individual reading test is essential in diagnosing dyslexia. **True**
34. Children with dyslexia generally tend to be poor spellers. **True**
35. Dyslexia usually lasts a long time. **True**
36. Dyslexia is characterized by difficulties in learning to read fluently. **True**

## APPENDIX D

### Survey Demographic Questions

1. What gender do you identify with?
  - Male
  - Female
  - Non-binary
  - Prefer not to say
2. How old are you? (Fill in blank)
3. What is your highest level of education?
  - Secondary school
  - Bachelor's degree
  - Master's degree
  - PhD degree
  - Other
4. How many years have you been teaching overall? (in any formal school-capacity) Fill in blank)
5. How many years of experience do you have teaching within the IB program? (Fill in blank)
6. What is your experience teaching students with dyslexia? (Click all that apply)
  - I have never taught a student with dyslexia
  - I have taught classes with some students with dyslexia.
  - I have taught special classes for students with dyslexia.
  - I have taught small group, specialized (less than 5 students) reading sessions for students with dyslexia.
7. In what country is your current school? (Drop down menu with choice of countries)
8. In what country is your primary citizenship? (Drop down menu with choice of countries)
9. Can students be declined entrance to your school because of academic abilities, including but not limited to dyslexia? (yes/no)

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