PRIMARY TEACHERS' KNOWLEDGE ABOUT LEARNING DISABILITIES

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Abstract

The present study was conducted to examine primary school teachers' level of knowledge on learning disabilities (LD). This information is important, as early detection of a learning disability has been proven to be imperative to a student's academic success in school. Since primary school teachers are the first educators with whom students come in contact, they may be the first to detect possible signs of a learning disability and initiate some form of intervention. As a result, this research examines primary teachers' level of knowledge about learning disabilities, where teachers obtained this knowledge, and teachers' beliefs about learning disabilities. An Internet survey was employed in this study through Fluid Survey. The questionnaire was advertised to primary school teachers to participate through teacher pages on Facebook. The survey received 143 responses from Ontario primary school teachers. The data analysis for this research was examined in three sections; demographics of participants, primary teachers' knowledge of learning disabilities, and cross analysis between the two other sections (demographics and teachers' knowledge about learning disabilities). Frequency, ANOVA, and chi-square tests were conducted on the data for analysis. It was concluded that teachers have robust knowledge on characteristics of learning disabilities and effective classroom strategies for students with learning disabilities. However, it was also determined that teachers' area of weakness was in their knowledge of risk factors that can cause a student to have a learning disability. Interestingly, early grade primary teachers (grade 1 and grade 2 teachers) received the least support from fellow teachers and educational assistance. Based on these findings it is recommended that further examination of how primary teachers use their knowledge in a classroom with students with LD is required.

Dedication

This work is dedicated to…

My amazing family!

Who have supported me, cheered me on, and helped me overcome the obstacles from my own personal learning disability!

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Organization of Study

The investigation is reported in five different chapters. Chapter One provides an introduction to the research, theoretical justification for the research, and the purpose of the study. Chapter Two consists of a literature review of the research. This literature review includes the topic of teachers' knowledge of LD and the importance of early detections. Additionally, Chapter Two contains a note about insufficient research that has been conducted on this topic and the research questions that will be examined. Chapter Three provides an explanation of the methodology used by the researcher in which the rationale for a survey to collect data will be examined. The limitations to the study, and ethical considerations will also be discussed. Chapter Four contains the results of the study in three parts; demographics of participants, knowledge of LD, and a cross-tab analysis of the data. Chapter Five comprises the discussion around the answers that were concluded based on the research questions and the data that were collected. Chapter Five includes the conclusion of the study and explores limitations of the study, recommendations, future research that should take place, and a final conclusion of the data findings. Finally, at the end of this report are the references and the appendices of all the extra documents that were used during the study.

Chapter One: Introduction

Learning disabilities (LD) are the most common disability served in special education programs in Canada (Wolforth, 2012) and one of the fastest growing categories of disability (Learning Disabilities Association of Canada, 2007). The Learning Disabilities Association of Canada (2007) stated that, according to Statistics Canada, between 2001 and 2006, LD was the fastest growing type of disability in Canada. Statistics Canada stated that of the children identified with a disability in Canada, 59.8% have been identified with a LD (Learning Disabilities Association of Canada, 2007). In 2001, 9.3% of students in Ontario were identified with an exceptionality (Bennett, Dworet, & Daigle, 2001). In Canada during the 2009–2010 academic year, 43.7% of students identified by an IPRC (Identification, Placement and Review Committee) were identified as having a LD (Learning Disabilities Association of Canada, 2011). Ontario in 2009 had approximately 300,000 students that require some form of assistance through special education (Bennett, 2009). Approximately, half of those identified with an exceptionality are identified with a LD, while the other half are identified with another exceptionality such as; giftedness, behaviour, autism, speech and language disorder, visual impairment, developmental delay, and hearing impairment (Woloshyn, Bennett, & Berrill, 2003). Canadian universities stated that 50 to 75% of their students registered with disability services were identified with a LD (Wolforth, 2012). This preponderance of learning disabilities in special education programs has also been documented in the United States and other countries. In American public schools 2.4 million or 5% of

students are identified with a LD under Individuals with Disabilities Education Act (IDEA) (National Center for Learning Disabilities, 2014). This number does not include students with a LD who attend private schools or who are home schooled in the United States. With the increased focus on the inclusion of all students with disabilities into the regular school classroom (Hsien, Brown, & Bortoli, 2009) it is now very common for an educator to have at least one or more students in his/her classroom with a LD.

Laws and regulations have been introduced in Canada and abroad to ensure students with exceptionalities receive special education. In Canada the Canadian Charter of Rights and Freedom (1982) states that all children have the right to an education, including children who have a disability. Furthermore, within the province of Ontario, the education of students is governed by the Education Act, which outlines how education is to be delivered to students enrolled in Ontario's publicly funded school system (Ontario Ministry of Education, 2010). The Act includes regulations pertaining to fees, taxation, alternative learning, student attendance, special education, and the roles of parents, teachers, principals, and administrators (Ontario Ministry of Education, 2005). The regulations of the Education Act that pertain to Special Education include Regulation 181/89: Identification and Placement of Exceptional Pupils, which outlines the procedures that school boards are required to follow when identifying and placing an "exceptional student" (Ontario Ministry of Education, 2005). Additionally, Regulation 306: Special Education Program and Services states the requirements for each school board in Ontario to maintain and implement a special education plan (Ontario Ministry of Education, 2007). Regulation 464/97: Special Education Advisory Committees states that every district school board must establish Special Education Advisory Committees

(SEACs) whose role is to provide recommendations to the board regarding the establishment, development, and delivery of special education programs and services (Ontario Ministry of Education, 2007). Finally, Regulation 298: Operations of Schools-General outlines the maximum enrolment in special education classrooms and the duties of the principals, vice-principals, teachers, and students.

In the United States the right to an equal education for all students with special needs was first initiated by Public Law 94-142, Education of all Handicapped Children Act, now called the IDEA, passed in 1975. The IDEA states that all individuals have a right to an education without any restrictions (Ladner, 2011). This was followed in 2001 with the introduction of the No Child Left Behind Act in which all children have a fair and equal right to an education (Greer & Meyen, 2009). Furthermore, the Individuals with Disabilities Education Improvement Act demanded that all individuals with a disability have a right to an education from birth until they are 21 (Ladner, 2011). In Australia, the government has an established program called the Victorian Educational Services for Children with Disabilities (VESED) that outlines the responsibility of all educators to educate all children, including those with a disability (Hsien, et al., 2009). VESED has five principles to support students' learning: every student has the right to be educated in a regular classroom; school-based resources are available to all students; collaborative decision-making processes are taught to students; students are not categorized by the disability; and all students are able to learn (Hsien, et al., 2009).

Therefore, with the increased movement towards the inclusive classroom and equal rights for all students, it is important to understand teachers' knowledge about the most commonly identified disability in schools in Canada, United States, Australia, and other

jurisdictions, which is LD (Clark, 1997; Woodcock & Jiang, 2013). Interestingly, there has been considerable research conducted on inclusive classrooms, teachers' attitudes towards students with LD, importance of early diagnosis of LD, and the confusion that surrounds LD. However, the literature on teachers' knowledge and understanding about LD is minimal.

Theoretical Justification

LD is one of the most common disabilities with which students are diagnosed in schools (Learning Disabilities Association of Canada, 2007). Furthermore, LD often affects a student's cognitive development, which results in students with LD not learning the same way or at the same speed as their peers (Wolforth, 2012). This can then result in students with LD falling behind in their academic development. However, a number of studies (National Center for Learning Disabilities, 2014) have determined that the sooner students with LD are identified and provided with accommodations and modifications, the sooner there will be an increase in their ability to succeed academically. Furthermore, teachers, especially primary teachers, play a critical role in helping to detect students with LD early in their education. As a result, there are a couple of theorists who have examined the effect teachers have on student success.

Dewey was an American philosopher who published on philosophy, education, democracy, and pragmatism (Dewey, 2012). Dewey stated clear roles that are the responsibility of the teacher to fulfill (Noddings, 2012). Dewey stated that teachers are supposed to help guide students with their learning, ensuring that they are engaged in the process, so that students are able to make those connections between prior knowledge and new knowledge (Noddings, 2012). This idea is important when researching teachers'

knowledge because, if teachers are supposed to help guide students' learning, they need to have a base of knowledge about students' educational needs so that they can assist these students accordingly. Teachers have the responsibility to keep their knowledge current on educational information in order to ensure they are providing the most relevant support and education to their students. This includes knowledge about students with a LD and being able to guide and engage those students in their learning. Noddings (2012) noted that in Dewey's philosophy, a teacher's role was to

> know something of their students' prior experience and design new learning experiences that grow out of it, but they must also observe their students' present experience and plan future experiences designed to move the student toward a more sophisticated grasp of the subject. (p. 31)

Dewey was expressing that teachers need to know students' education history so that they can then use this information to help assist students in their future education. It is especially important for teachers to know their students' past and present experiences to help identify a student with a LD. Furthermore, if teachers are aware that there is a family history of LD or if there is any documentation of any possible LD risk factors, then the teachers can be aware to look for possible signs of LD and implement the appropriate support needed for the student's current and future education. Therefore, if teachers have the appropriate level of knowledge about LD, they can then help plan effective future educational steps that need to be taken for the student to progress and succeed in his/her education.

Similar to Dewey's philosophy, Desforges's theory included a statement with regards to teachers' role in students' education. Desforges (1995) believed the primary

role of teachers is to promote students' learning, which is accomplished not by what the teachers know, but by how they apply their knowledge. From this perspective, Desforges argues that experienced teachers are more knowledgeable than novice teachers because they have more extensive classroom experience. As a result, Desforges concludes that a positive correlation exists between teachers' level of knowledge and their years teaching. This relates to two of the research questions in this thesis that pertain to where teachers obtain their knowledge and years of experience affect teachers' knowledge of LD.

Furthermore, Wolfensberger's Theory of Normalization, recognizes that all individuals, including those who are devalued by the larger society (i.e., individuals with special needs) have the right to live a normal life (Wolfensberger & Tullman, 1982). Wolfensberger and Tullman (1982) expressed the importance of Wolfensberger's Theory of Normalization based on critical roles different members of society play in ensuring that individuals with a disability obtain the right to a normal life. This includes teachers; teachers play an important role in the education of a student with a LD, as they are often the main sources from which students learn information and are assisted in their academic development (Brook, Watemberg, & Geva, 2000). Hence, this thesis's examination of whether teachers have the appropriate level of knowledge to effectively assist students with LD in being academically successful and functioning effectively in society coincides with Wolfensberger's theory.

In addition to the theories and theorists that support the important role teachers play in students' academic success, there are also many psychological factors that explain the importance of an early LD identification. Spitzer and Aronson (2015) state that the longer it takes for a student to be identified with a LD and intervention to occur, the more likely

the child will fall behind and a larger achievement gap will occur between students with LD and their peers. These achievement gaps between students with LD and their peers may cause students with LD to feel like they do not belong, thereby compromising their social identity, causing a psychological predicament (Spitzer & Aronson, 2015). When students are identified with a LD later in their education, it can trigger a crisis as they struggle with how this new identity affects their social identity (Spitzer & Aronson, 2015). As a result, this can then interfere with the students' with LD performance and their attitudes and willingness to seek extra assistance for their LD because of the social backlash they fear they may receive (Spitzer & Aronson, 2015). Consequently, if students are identified early on in their education, when the social pressures are not as intense, these students may be more open and accepting of intervention and assistance for their LD. This in turn may result in closing the gap or at least minimizing the gap between the academic performance of students with LD and their peers. These research findings support this thesis's objective to examine primary teachers' knowledge of LD. Specifically, if students are identified early on in their education, the psychological impact can be limited. Therefore primary teachers play a critical role in the academic and mental development of students with LD by having these students identified and implementing intervention early in their education to close the academic gaps between students.

The theories mentioned previously demonstrate the importance of research examining primary teachers' knowledge about learning disabilities. Dewey's (2012) philosophy stated that teachers' involvement in students' education is one of the most important components in students' academic success. Desforges (1995) stated that

teachers' knowledge, attitude, and beliefs contribute an important component in teachers' instructions. Wolfensberger's Theory of Normalization (Wolfensberger & Tullman, 1982) examined how each individual has the right to be a normal member of society, including students with LD. Additionally, it is important for students to be identified with LD early in their education to reduce the psychological impact of students questioning their social identity. Therefore, it is important to collect research on primary teachers' knowledge of a common identification, such as a learning disability.

Purpose of Study

The purpose of this study is to examine primary teachers' knowledge of LD. It is important to study primary teachers' knowledge of the disability, as they are the first educators to detect a child with a possible LD and to initiate some form of intervention. For the purpose of this study primary teachers will be the term used to describe teachers teaching kindergarten students to grade 3. Students who are identified with a LD early in their education have a greater likelihood of a positive academic experience than those who are identified later in their education (National Center for Learning Disabilities, 2014). Furthermore, a barrier encountered by students with a LD is the lack of teachers' knowledge about the disability, accommodations, and services these students require (Saravanabhavan & Saravanabhavan, 2010). Teachers' lack of knowledge often contributes to the students' poor performance, low motivation in school, and a lack of the accommodations (Woodcock & Jiang, 2013). The findings of this research may provide insight into primary teachers' level of knowledge about LD, their preparedness, and inclusive classrooms. Additionally, these findings may be of interest to LD specialists, classroom and special education teachers, administrators, school board officials, and

parents.

Chapter Two: Review of Related Literature

The purpose of this study is to examine primary teachers' knowledge of LD. Before determining a method of collecting research and the importance of collecting the research, an in-depth literature review was completed. Multiple research studies were examined on the topic of primary teachers' knowledge of LD including confusion of LD definition, teachers' attitudes, perceptions, and level of knowledge, inclusion of students with LD in the classroom, early identification, and insufficient research.

Confusion of LD Definition

It can be difficult for educators to detect students with LD when there is currently confusion in our society in regards to the definition of LD and its classifications. Siegel (1999), Harrison (2005), and Lange and Thompson (2006) all noted that there is inconsistency in the definition of LD. This lack of a standard definition of a LD may be a contributing factor to teachers' confusion and knowledge of LD.

> The question of who is learning disabled is, obviously, one of the most critical questions for the field. It is very important for those involved in research and clinical practice; it is crucial for educational systems, especially those systems in which funding is based on the number of individuals with learning disabilities. (Seigel, 1999, p. 304–305)

Currently in the United States and Canada there is still no standardized clear definition of a LD, but there are some commonalities in the different definitions (Harrison, 2005). Most definitions of LD note in some form that an individual with this disorder has a weakness in at least one psychological process, such as in reading, writing, mathematics, and so on (Callinan, Cunningham, & Theiler, 2013; Siegel, 1989). The IDEA in 2004

defined LD as "a disorder in one or more of the basic psychological process involved in understanding or using language that may manifest itself in an imperfect ability to: listen, think, speak, read, write, spell, or do math" (Callinan et al., 2013, pp.1–2), while, the Learning Disabilities Association of Ontario (2014) defines a LD as

> a variety of disorders that affect the acquisition, retention, understanding, organization or use of verbal and/or non-verbal information. These disorders result from impairments in one or more psychological processes related to learning (a), in combination with otherwise average abilities essential for thinking and reasoning. Learning disabilities are specific not global impairments and as such are distinct from intellectual disabilities. (p.7)

As a result, many teachers' understanding of LD are based on different definitions with some common themes, such as a student having difficulty in processing information in either mathematics, reading, and/or writing.

As mentioned previously, a number of researchers (e.g., Callinan et al., 2013; Siegel, 1999; Woodcock & Jiang, 2013) state that the confusion surrounding LD identification is a result of there being no established and consistent definition for LD. However, in May 2013 the Diagnostic and Statistical Manual of Mental Disorders 5 (DSM-5) was released by the American Psychiatric Association (American Psychiatric Association, 2014). It is now used in the United States, Canada, and other locations around the world as a guide to assist health care professional with diagnosing mental disorders (American Psychiatric Association, 2014). The guide contains symptoms, descriptions, and clinical language so that there can be a common understanding and communication among all professionals that examine mental disorders (American

Psychiatric Association, 2014). As a result, the DSM-5 contains the most up-to-date information about the criteria in diagnosing an individual with a mental disorder (American Psychiatric Association, 2014). The DSM-5 defines a LD as "a type of Neurodevelopmental Disorder that impedes the ability to learn or use specific academic skills (e.g., reading, writing, or arithmetic), which are the foundation for other academic learning" (Tannock, 2014). If all researchers, clinical personal, psychologists, and all professionals that came in contact with LD used DSM-5, it would then create a consistency in LD diagnosis and therefore limit the confusion. This would include teachers using DSM-5 to help in the process of detecting students with a possible LD early in their education experience so that referral for assessment and identification would occur as early as possible.

Conversely, with the DSM-5 established, it is unclear why some researches still choose not to use it. Dr. Thomas Insel, director of the National Institute in Mental Health stated that the National Institute of Mental Health would no longer be using DSM (Szalavitz, 2013) because the National Institute of Mental Health wants to use a more comprehensive approach. As Insel (2013) states,

> Unlike our definitions of ischemic heart disease, lymphoma, or AIDS, the DSM diagnoses are based on a consensus about clusters of clinical symptoms, not any objective laboratory measure. In the rest of medicine, this would be equivalent to creating diagnostic systems based on the nature of chest pain or the quality of fever. Indeed, symptom-based diagnosis, once common in other areas of medicine, has been largely replaced in the past half century as we have understood that symptoms alone rarely indicate the best choice of

> treatment. Patients with mental disorders deserve better. (para. 2)

Later, Insel described why they do not use DSM by giving the following metaphor:

> Imagine deciding that EKGs were not useful because many patients with chest pain did not have EKG changes. That is what we have been doing for decades when we reject a biomarker because it does not detect a DSM category. We need to begin collecting the genetic, imaging, physiologic, and cognitive data to see how all the data – not just the symptoms- cluster and how these clusters relate to treatment responses. (para. 4)

As a result there is still an ongoing debate among psychologists as to what definition or method should be used to assess and diagnose LD disorders. Consequently, this can affect teachers' confusion with helping to identify possible students with LD.

Even when definitions of LD agree, there are still uncertainties in identifying students with LD. In the United States the prevalence of LD identification has differed by as much as 4% to 5% (Callinan et al., 2013). These high prevalence rates commonly exist because of different expectations and processes of identifying students with LD (Callinan et al., 2013). In the United States and Canada, the main reasons for the large discrepancy of LD identification across provinces and states is because of unclear definitions and identification conditions (Woodcock & Jiang, 2013). Contributing to the confusion of LD in Canada, education is under provincial/territorial jurisdiction, not under the federal government. As a result, each province and territory has its own department of education that controls its special education funding, curriculum, identification procedures, services and the delivery of the program in its jurisdiction (Winzer, 1996; Dworet & Bennett, 2002). This generates differences in the special education programing across the ten

provinces and three territories of Canada, which may further contribute to educators' confusion about LD. Additionally, if an educator is trained in one jurisdiction and then teaches in a different jurisdiction there may be variations in the definition of a LD (Dworet & Bennett, 2002).

Scruggs and Mastropieri (2002) conducted research on addressing the problem of the LD identification in the United States. In their research they identified six major problems with the identification of students with a LD. These problems include: over-identification, variability and specificity, conceptual considerations, discrepancy issues, early identification, and local implementation (Scruggs & Mastropieri, 2002).

Over-identification has been increasingly occurring over the last 40 years (Scruggs & Mastropieri, 2002). Scruggs and Mastropieri concluded that a large portion of the over-identification was a result of misclassification of the disability due to teachers' requirement to get more instructional help in the classroom. Furthermore, Scruggs and Mastropieri discussed how over-identification has been a result of imprecision in definitions, a change with classifying individuals with a LD who would previously be identified with mental retardation, and the term being overgeneralized (Scruggs & Mastropieri, 2002). In the United States, since 1975, the number of students identified with a disability has dramatically increased by 150%, with LD representing 50% of all students identified with a disability (Scruggs & Mastropieri, 2002). This greatly exceeds the previous rate of 20–30% of students being identified with a disability were labeled with a LD (Scruggs & Mastropieri, 2002). Even the rate of 20-30% may be too high, as Wagner and Garon (1999) believe that the number of all students enrolled in school with a LD was actually closer to 1%–3% of elementary school children. This over estimation

may be due to teachers' labeling all students who are struggling academically as having an LD. It can be argued that students who have low achievement academically cannot be reliably distinguished from those students who have a LD, and this is another contributing factor with the issues of students' with LD identification (Scruggs & Mastropieri, 2002).

To help assist in distinguishing between students with LD and students who have low academic achievement the responsiveness to intervention (RTI) may be used (Fuchs, Mock, Morgan & Young, 2003). RTI examines the difference between pre- and post-intervention (Gresham, 2002). With RTI the goal of an intervention is to have improvement in students' post-intervention performance. When the intervention causes no change in the student's performance it is believed that this provides evidence that the student has a LD (Gresham, 2002). However, RTI can still contribute to educators' confusion surrounding LD. This is a result of RTI being implemented in a variety of formats in different jurisdictions, where the differences occur in the number of interventions that are given; the view of the process as eligibility to be identified (i.e., is the RTI the suitable evaluation for identification of LD, or a precursor); who delivers the intervention; and how the intervention is monitored or evaluated (Fuchs et al., 2003).

In contrast to RTI, a discrepancy model can be used to identify students with an LD. Since 1976 a discrepancy between a student's intellectual and academic ability has been one of the main criterion for defining LD (Kavale, 2001). The discrepancy model is used to assess the difference between a student's intellectual ability (as measured by an intelligence quotient) and the student's academic achievement (Kavale, 2001). The premise of the discrepancy model is to ensure that the student's difficulty

cannot be attributed to low intellectual ability (Kavale, 2001). Discrepancy issues contribute to the problem of LD identification because of the use of IQ test results to determine if a student should be identified with a LD. However, Scruggs and Mastropieri argue that IQ test results are not an accurate prediction of a student's academic performance or growth because there is no consistency in the methodology used to measure a student's discrepancy (Kavale, 2001). Therefore, the discrepancy model continues to foster inconsistency rather than creating a standardized method of identifying LD.

Scruggs and Mastropieri (2002) stated that these problems with the identification of LD can be eliminated through the implementation of a strict obedience to the LD identification criteria and through an increase in the consistency of the criteria used to identify students. Scruggs and Mastropieri have proposed several alternative procedures for the identification of students with a LD. The alternative methods for the identification of LD include: double-deficit criteria, phonological process core difference model, chronological age definitions, Bayesian procedure, neuropsychological assessment, assessment of cognitive processing, and operational interpretation. Double-deficit criteria is an identification procedure that uses criteria from phonic analysis tasks and rapid continuous naming of letters and numbers to determine if an individual should be identified with a LD (Scruggs & Mastropieri, 2002), while, phonological process core difference model helps to determine if a student has a LD in early grades by the difference in a student's phonological process (Scruggs & Mastropieri, 2002). The difference can determine if a student is a poor reader or if he/she is dyslexic. The chronological age definitions alternative method suggests students being identified with a

LD if on achievement they score below their age expectancy (Scruggs & Mastropieri, 2002). Bayesian identification procedure examines a student's prior and current information to determine if the student has a LD (Scruggs & Mastropieri, 2002). Furthermore, the neuropsychological assessment identification procedure examines numerous neuropsychological assessments to determine if a student should be identified with a LD (Scruggs & Mastropieri, 2002). Assessment of cognitive processing for identifying students with LD uses a number of cognitive process tests to determine if the students should be identified (Scruggs & Mastropieri, 2002). Finally, operational interpretation uses a five-level identification process that focuses on an individual's operational definition to determine if the student has a LD (Scruggs & Mastropieri, 2002).

Educators' confusion of LD is not solely limited to the definition and identification debates; there is additional confusion around the risk factors that may cause someone to develop a LD. It is generally believed that a LD is caused by neurological differences in which a person's ability to take in, remember, comprehend or express information is affected (Learning Disabilities Association of Ontario, 2015). The Learning Disabilities Association of Canada (2014) identifies three causations of a LD; heredity, problems that occur during pregnancy and birth (i.e., illness, injury, drug use, alcohol use during pregnancy or lack of oxygen, premature birth, low birth weight or prolonged labour), or incidents that occur after birth (i.e. injuries to the head, exposure to toxins and nutritional deprivation). The incidents that occur after birth increase the likelihood of a LD when it occurs early in a child's life, when the brain is still in a critical stage of development (age 2 and younger) (Keenan, Runyan, Marshall, Nocera, Merten, & Sinal, 2003). This

includes poor nutrition, injuries to the head, and exposure to toxins. The most contentious of these is brain injuries.

There is not only confusion among educators about the definition and risk factors of a LD, but also misconceptions exist among teachers about the different types of LD. Mayes and Calhoun (2007) examined misconceptions about the types and frequencies of different learning disabilities. Mayes and Calhoun discussed that it is commonly believed that a LD in mathematics is rare, while a LD in reading is the most prevalent. Mayes and Calhoun stated that the misconception about reading being the most prevalent classification of LD was a result of none of the published articles stating this fact used any empirical research to support their statement. Furthermore, Mayes and Calhoun stated that the only article that conducted research and stated a report on the prevalence of reading LD was Erik and Elkins (1975), in which they used a questionnaire, where a large majority (80%) of the content was focused on remedial reading. Additionally, Mayes and Calhoun state that research into writing disabilities has been neglected. Mayes and Calhoun used an experimental design in which 485 children were "administered the Wechsler Intelligence Scale for Children – III (WISC- III, Wechsler, 1991) and the WIAT Basic Reading, Reading Comprehension, Numerical Operations, Spelling and Written Expression subtests" (p. 439). The 485 children that were used in Mayes and Calhoun's research had all be previously identified as having a learning problem of some sort and referred to a special clinic. Mayes and Calhoun concluded that the most commonly occurring LD was a LD in writing. Mayes and Calhoun determined this by using the WISC-III and WIAT to compare participants' IQ and achievement in their sample of students referred to them, and discovered that only 4% of students with LD had

a LD in reading alone. Furthermore, only 4% of students had a LD in only mathematics. Meanwhile, 50% of students identified with LD had a LD solely in writing, and 42% of students had a LD in writing but also had a LD in reading and/or mathematics (Mayes & Calhoun, 2007). This finding is very different from other research previously conducted where the belief was that a LD in reading was the most common classification (Mayes & Calhoun, 2007). As a result there is a discrepancy among the different published articles in regards to the prevalence of the different classifications of LD. This misinformation then leads to many people developing misconceptions and confusion about the different classifications of LD.

In Ontario there is an identification process developed by the Ontario Ministry of Education that educators are expected to follow when they believe a student has a LD. Recently, on the 26th of August 2014, the Ontario Ministry of Education developed and released a new Memorandum (Policy/Program Memorandum No. 8) that sets out requirements for school boards to follow for identifying a student with a learning disability (Ontario Ministry of Education, 2014). This process begins with screening students in school through anecdotal notes recorded by the regular classroom teacher and a special education teacher. Precursors to identifying a student as having a learning disability can be that they are performing academically behind the level of their peers (Harrison, 2005). Screening, through assessment such as CASI and PM Benchmarking, can take place individually with students or in a group of students, in which teachers can then implement programs based on the screening results (Harrison, 2005). These screenings do not formally identify students with a LD but the results indicate that further assessment should be conducted to determine if a student does have a LD.

Once students have been screened and the student is persistently demonstrating characteristics of a LD, a more in-depth assessment should be conducted by a psychologist or by an individual who is supervised by a psychologist (Ontario Ministry of Education, 2014). A member of the College of Psychologists of Ontario must conduct the psychological and psycho-educational assessments with consent from the student's parents (Ontario Ministry of Education, 2014). The assessment is categorical and data are collected to determine if a student can be formally diagnosed with a LD (Harrison, 2005). These in-depth assessments should include: information provided by student, educator, and parent (this includes in-class assessment and observations of the student at home and at school), student's education history, medical information (including information on student's hearing and vision), and a professional assessment (psychological and/or psycho-educational assessments; Ontario Ministry of Education, 2014). In Ontario psychologists use DSM-5 to assess a student for a LD (Learning Disabilities Association of Ontario, 2014). The above assessments are to be used in an IPRC meeting in which the attendees will determine if the student should be identified with a LD. Additionally, an IEP is to be created and implemented. During this process students are not identified with a LD until an IPRC meeting has been conducted and it has been officially determined that the student does have a LD. However, prior to this, teachers may start to assist possible students' with LD learning by implementing some accommodations to help these students succeed academically.

Many teachers and parents find the IPRC process of having a student formally identified with an exceptionality to be confusing. This confusion does not occur only with the identification process, but also the concept of LD, its definition, and misdiagnosis

(see Scruggs & Mastropieri, 2002; Siegel, 1999). Overall, the lack of a standard universal definition of LD has imposed a problem with identifying students. Kavale and Forness (2000) stated that, "the failure to produce a unified definition has meant that LD lack two critical elements; understanding – a clear and unobscured sense of LD – and explanation – a rational exposition of the reasons why a particular student is LD" (p. 240). Kavale and Forness argue that until LD definition is clearly conceptualized, difficulties with LD identification will always be present.

Acquired Brain Injuries

As stated previously there are many misconceptions and confusion surrounding LD; this is not only limited to the definition of identification process, but there is additional debate over the causes of LD. Brain injuries may cause an individual to develop a LD because a learning disability is a neurological disability in which complication somewhere in the brain could affect the development of the brain and therefore cause an individual to develop a learning disability (Learning Disability Association of Canada, 2014). However, advocates for acquired brain injury (ABI) suggest this is false and instead argue that individuals who acquire an exceptionality (disability) after some form of brain injury is different than developmental LD. Zinga, Bennett, Good, and Kumpf (2005) define an ABI as, "any type of sudden injury that causes temporary or permanent damage to the brain" (p. 2). Where the damage to the brain can be the result of some form of trauma that has occurred to the head, for example, concussion, anoxia, infection, cerebral vascular accident, etc. Furthermore, Zinga, Bennett, Good, and Kumpf (2005) argue that ABI is an unique exceptionality affecting students' learning because it is acquired and the trauma impacts the function of the brain, where each individual is

affected differently. If the student acquires the brain injury during their developmental stages, it can have a more lasting affect. Zinga, Bennett, Good, and Kumpf believe that those students who have ABI have different needs than those students with LD, such as cognitive fatigue, social inappropriateness, agitation, memory, initiating actions and emotional outburst. This confusion results in labeling students with LD who might have some other disability and not LD (i.e. ABI). However, when examining the definition of LD and ABI, one might portray ABI to be a cause of LD because a LD is "a disorder in one or more of the basic psychological process involved in understanding or using language that may manifest itself in an imperfect ability to: listen, think, speak, read, write, spell, or do math" (Callinan et al., 2013, pp.1–2). In contrast, Zinga, Bennett, Good, and Kumpf define ABI as any form of abrupt injury to the brain that results in permanent or temporary damage, where by the injury could be a result of head injury in an accident, concussions, toxicity, cerebral vascular accident, anoxia, or an infection (Bennett, Good & Kumpf, 2003), where this damage to the brain can affect a student's cognitive ability (i.e. reasoning, thinking, communication), and the way they think, therefore also impacting the way they learn (Rees & Skidmore, 2008). Since an ABI may affect the way someone thinks and learns, it may be argued that an ABI is a cause of LD (Learning Disability Association of Canada, 2014).

In contrast Obrzut and Hynd (1987) argue that that the central nervous system of children with LD is dysfunctional and that they portray more subtle neurological deficits than children with ABI. In addition, ABI in children is unpredictable and can have a more profound effect as a result of their brain still developing (Zinga, Bennett, Good, and Kumpf, 2005). Furthermore children and adolescents with ABI share common problems

with students who have a LD such as: academic underachievement, imperfection in a students' ability to think, read, write, speak, listen, spell or do mathematics (Obrzut & Hynd, 1987). However, while LD is known to be a life long disability, students with ABI have the potential for recovery from the incurred brain injury (Obrzut & Hynd, 1987) even if that recovery may take many years and a full cognitive recovery may not occur (Rees & Skidmore, 2008). Rees and Skidmore (2008) state that it is widely believed that after ABI students can access the learning they acquired before the injury, however it then becomes very difficult for new learning to occur. Often, ABI students' way of thinking has changed as a result of the injury. With assistance, ABI students can often quickly return to the same academic level they portrayed previous to the injury, although these students will need help to learn in new ways. Often ABI can lead to frequent behavioural and educational difficulties, some very similar as those portrayed by students with a LD (Rees & Skidmore, 2008).

Zinga, Bennett, Good and Kumpf (2005) argue that ABI and LD are different and therefore the education support accommodations needed are also different. Zinga, Bennett, Good and Kumpf state that only two provinces (British Columbia and Newfoundland and Labrador) acknowledge ABI as an exceptionality and provide significant support needed for these students. Both British Columbia and Newfoundland and Labrador do recognize ABI as a distinct exceptionality in which students do require accommodations, however, it is not recognized in either of their legislations (School Act) as an exceptionality (Zinga, Bennett, Good and Kumpf, 2005). For the majority of Canada, ABI is under-recognized and poorly supported in the Canadian federal and provincial education systems (Zinga, Bennett, Good and Kumpf, 2005). Zinga, Bennett,

Good and Kumpf argue that access to appropriate accommodations and responsiveness are key issues for ABI. Students with ABI in the regular classroom may not portray common patterns of a disability that would qualify them for accommodations. Furthermore, if their patterns do depict that of someone who needs accommodation, ABI students often do not benefit from the accommodations given (Zinga, Bennett, Good and Kumpf, 2005). This is a result of each ABI individual having a unique injury and therefore each individual has unique accommodations needs. Zinga, Bennett, Good and Kumpf recommend that an ABI student's appropriate accommodations be determined through a trial and error strategy, where there are frequent reevaluations and alterations made. The frequent reevaluations and alterations for ABI students are very important because unlike LD, ABI cognitive ability can change vastly over a short period of time. This change results in the required accommodations changing or not being needed for the student with ABI. As a result Zinga, Bennett, Good and Kumpf argue that the appropriate accommodations needed by an ABI student would be different than those needed by a students with LD.

After examining literature regarding both ABI and LD it can be noted that there are many commonalities and difference between the two exceptionalities. For example, both ABI and LD are a result of a neurological disorder. However, LD is an exceptionality that an individual has for their lifetime, while this is not necessarily true for students with ABI. Additionally, the literature on ABI and LD, in both cases, addresses the issue of the confusion and misinformation in regards to the exceptionality. Teachers' limited knowledge of ABI and LD, along with the conflicting research of both contributes to the confusion of ABI and LD. For the purpose of this research it will be assumed that ABI

and LD are two separate exceptionalities. As a result this research will be examining primary teachers' level of knowledge on LD and will not be evaluating teachers' comprehension of ABI.

Early Identification

The importance of an early LD identification is critical for students as it ensures that they get the support they need for academic success (Felton, 1992; Reschly, 2005). The early identification of students allows intervention to occur with the overall goal of preventing low achievement that often results in students with LD having a lifelong battle in their education journey (Reschly, 2005). Scruggs and Mastropieri (2002) discussed that early identification of LD is crucial for students as it is easier to remediate a student in the younger grades because the gap between their academic performance and their grade expected academic achievement is not as large compared to students in the higher grades who have not had any academic remediation. Scruggs and Mastroiperi believed that the focus for students with LD should be on early identification and implementation of programs to help these students get caught up to the achievement appropriate for their grade level. Therefore, if remediation is not in place, the students are at a great risk of falling significantly behind their peers in their education.

Unfortunately, a number of schools follow the "wait to fail" model (Scruggs & Mastropieri, 2002), in which they do not identify students with LD until the student has failed a number of courses. If education waits until failure occurs, there will not only be significant emotional effects that hinder students' progress, but it will also become increasingly difficult for the student to achieve grade-level expectations (Scruggs & Mastropieri, 2002). Children are often not identified with LD until the third grade

because schools that utilize the discrepancy model for identifying LD argue that the student must be preforming at least two academic years below their grade level before determining if a LD exists (Scruggs & Mastropieri, 2002). However, the advantage of an early identification is that it allows educators to determine students' phonological processes, which are important in predicting students' reading ability (Felton, 1992). By providing students with intervention to support phonological development it may improve the students' reading, and understanding of speech and sound (Felton, 1992). Early identification may also assist students in their academic progress because each progressively higher grade puts a greater demand on reading skills. This occurs, in part, because of the old adage that if you can read, you can go to university, which relies heavily on a student's ability to read. In addition to academics, reading also plays an important part in our society. As Jenkins & O'Conner (2002) stated;

> We can all agree that reading is one of the principle tools for understanding our humanity, for making sense of our world, for advancing the democratic ideal, and for generating personal and national prosperity. We can agree that ability to read allows us to achieve three important goals: building knowledge (e.g., learning about the physical world); acquiring information for accomplishing tasks (e.g., installing a VCR); and deriving pleasure and feeding our interests (e.g., how our favorite athletic team has fared). Lacking reading ability, our lives would be very different. They would not be as rich. (p.1)

Students who have a LD in reading face huge challenges, including hindering their ability to reach a reading proficiency level in which they are able acquire

information and build knowledge (Jenkins & O'Connor, 2002). A lot of these students' frustrations come from reading comprehension, which is the direct purpose of reading. In order for someone to be a successful, they must be able to perform the three pillars for reading comprehension: "the ability to read words; the ability to comprehend language; and the ability to access background and topical knowledge relevant to specific texts" (Jenkins & O'Connor, 2002, p.1). Students with a LD in reading are weak in one or more of those three pillars, which causes problems with the students' reading comprehension ability. In students with a LD in reading, one of the early identifiers is the students' difficulty in obtaining efficient word-level reading skill (Jenkins & O'Connor, 2002). The longer it takes to identify a student with a reading LD, the more time there is for the student's reading difficulties to increase. If a student is not identified early enough their reading difficulty can become intractable (Jenkins & O'Connor, 2002). Jenkins & O'Connor noted that often students with a LD in reading are not identified until junior grades. In order for the most effective intervention to occur, these students need to be identified in Kindergarten/early primary grades. As a result Jenkins & O'Connor state that in order for students with LD in reading to be successful in their academics they need to develop the ability to succeed at the three pillars of reading comprehension, where interventions to assist these students are conducted very early in their education.

Catts, Nielsen, Bridges, Liu and Bontempo (2015) studied the early identification of students who have a LD in reading through the use of universal screening and progress monitoring of 366 kindergarten students. Catts et al. argued that early identification of students with a reading disability is critical to helping students with a LD obtain remediation. Catts et al. administered screening tests to each student as they entered

kindergarten; students who were identified as being at risk of having a LD in reading were provided intervention. It is important to provide intervention that focuses specifically on developing skills to assist the students with their reading development (i.e., phonological development, letter knowledge and word development) as it allows intervention to be implemented before negative consequences develop, such as the downward spiral of lowered self-esteem, poor motivation and underachievement (Catts et al., 2015; Snowling, 2013; Lange & Thompson, 2006). At risk students who received early intervention obtained a significant increase in their reading ability (Catts et al., 2015). The intervention Catts et al., provided students worked on students' phonological development, letter knowledge and word knowledge. Additionally Catts et al., determined that early intervention received by students identified as being at risk resulted in an increase in their reading accuracy and fluency by the end of grade one, especially when early intervention was implemented by January of their kindergarten year.

A LD in reading often affects students' writing ability and consequently every aspect of their education, resulting in increased chances of dropping out of school early (Jenkins & O'Connor, 2002). Similar to the importance of early identification of those students with a LD in reading, it is also important to identify those students with a LD in writing. Graham, Harris, and Larsen (2001) conducted a study that examined prevention and interventions for students with a LD in writing, in which Graham et al. discussed four previously conducted studies that determined that early intervention programs benefit students with a LD in writing. This benefit can be seen in higher grades, where students who have participated in early writing intervention are close to, if not at, grade level in their writing compared to those students with a LD in writing who did not participate in

early intervention (Graham et al., 2001). The reason for early intervention being successful is because it assists struggling writers to catch up with their peers early in their academic process before their disabilities become more intractable (Graham et al., 2001). Graham et al. noted that the early intervention writing programs that are most likely to benefit students with LD are; receive individual guided writing opportunities, provide specific guidelines and examples for students to follow, and allocate additional time for them to write.

Although students' progress in their reading and writing can help depict if a student has a LD, common behavioural characteristics that a student portrays can assist in identifying students with a LD early in their education. McKinney (1989) discussed his findings concerning the common behavioral characteristics of students with LD. Knowing the common behavioural characteristics of students with LD not only helps increase the ability to identify a student with a LD in a timely fashion, it also ensures that intervention can be provided early so that students can benefit from the support given. McKinney observed that two thirds of students in grades 1 and 2 who were diagnosed with LD "displayed a persistent pattern of maladaptive classroom behavior that distinguished them from average achieving peers and that was associated with continued underachievement overtime" (p. 141). Examples of a maladaptive behaviour in the classroom would be a student's inability to adjust during the day and interfering in their learning and their peers' learning. Furthermore, students who showed maladaptive behaviours and had a LD were not progressing at an appropriate rate in their learning compared to students who did not have a LD. Ultimately, McKinney determined that interventions, focusing on behaviour and academics, in the early years helped promote,

especially with behavioral issues, greater academic success for students with LD later in life. Such intervention gives students the tools and resources they need to succeed academically and socially and to build confidence in their learning early in their education experience.

Early identification of a LD is important for a number of factors. These factors include: students' future academic success, social development, and psychological development. Students with LD should be included in a regular classroom in which appropriate support is provided for the students' specific LD. In this section, teachers' attitudes and knowledge were two factors that were continually noted to play a key role in success in an inclusion classroom for students with LD. It is important to examine primary teachers' knowledge of LD, as these teachers are among the first teachers to have students with LD included in their classrooms.

Teachers' Level of Knowledge

Despite the importance of early identification, there is the continuous issue of teachers informally mislabeling students as having a LD (Scruggs & Mastropieri, 2002). The mislabeling of students may be due to the teacher's limited knowledge and understanding of LD. This limited knowledge may also impact their perception and treatment of students who have a formal identification of LD.

D. C. Wright (2008) examined teachers' level of knowledge on nonverbal learning disabilities by studying 116 teachers from three different elementary schools in Delaware. One subgroup of teachers was given a short fact sheet on nonverbal LD and the other subgroups were not given this fact sheet. To collect his research, Wright used a survey along with a pre- and post-test given to teachers given during staff meetings. Wright

found in the pre-tests that there was very little difference between the subgroups of teachers based on their knowledge of nonverbal learning disabilities. Furthermore, he found that teachers were not comfortable referring a student for further evaluation if they believed the student had a nonverbal LD (Wright, 2008). Additionally, Wright found that 95% of teachers involved in his research did not know the indicators of a nonverbal LD. Wright concluded that teachers are not knowledgeable of nonverbal learning disabilities and therefore more needs to be done to increase teachers' knowledge of this LD. Wright also concluded that administering a short fact sheet about LD established a significant gain in teachers' knowledge of LD.

Abercrombie (2009) based her research on the fact teachers' attitudes were cited as the most important factor that determined successful inclusion of a student with LD. While the focus of this research was on attitudes towards students with LD, there were findings that show the importance of teachers' knowledge about LD and how that can affect their teaching. Abercrombie examined special education teachers' and general education teachers' attitudes towards students with LD. The specific factors that Abercrombie examined regarding teachers' attitudes were: teacher background variables, institutional variables, teacher preparedness, working environment, and performance incentives. Abercrombie determined that variables from the teachers' background and the institutions from which they obtained their Bachelor of Education could not be used to predict teachers' attitudes towards students with LD, as there were no correlations between the different groups of teachers studied and their attitudes towards students with LD. However, there was a correlation between teachers' motivation, environment, and incentives that influenced teachers' attitudes towards students with LD (Abercrombie,

2009). Of particular interest with regards to teachers' knowledge about LD and how that may affect their teaching, Abercrombie determined that teachers needed more training in special education to fully understand how to support students' specific needs, thereby enabling their students to be academically successful. Furthermore, she noted that although there were some similarities between general education teachers and special education teachers, special education teachers expressed a concern about general education teachers' attitudes towards students with LD and their willingness to teach these students in a regular classroom (Abercrombie, 2009).

Brook et al. (2000) used a questionnaire to examine Israeli teachers' knowledge and attitudes towards students with Attention Deficit Hyperactivity Disorder (ADHD) and LD. Brook et al. noted in their findings that teachers' knowledge of LD is limited. These findings are important, as often it is the student's educator who first recognizes the possibility that a student may have ADHD or LD (Brook et al., 2000). As a result, if teachers have limited knowledge of LD, this will affect the teachers' ability to recognize and provide appropriate accommodations to assist these possible students with LD to reach their academic potential and to cope with their exceptionality.

Interestingly, Saravanabhavan and Saravanbhavan (2010) examined teachers' level of knowledge towards LD in India, where in India little attention is given to disabilities that are not physically noticeable. Saravanabhhavan and Saravanbhavan determined that "teaching experience and familiarity with persons with LD did not affect the knowledge level of the three groups of participants" (p. 136). However, Saravanbhavan and Saravanbhavan (2010) did note that the limited knowledge of LD resulted in negative attitudes by teachers towards students with the identification. Similarly, Aladwani and Al

Shaye (2012) identified in their research that Kuwait teachers' knowledge of LD was insufficient for teachers to have the ability to detect early signs of dyslexia in primary students. Additionally, several studies (Aladwani & Al Shaye, 2012; Greer & Meyen, 2009; Kirby, Davies, & Bryant, 2005; Saravanbhavan & Saravanbhavan, 2010) identified a number of factors that influence teachers' knowledge of LD. These factors include: poor training, lack of time for professional development on LD, overload of work, teacher preparation programs, insufficient preparation of special education teachers, accountability of teachers, teachers' misunderstanding of special education terms, and their amount of responsibility (Aladwani & Al Shaye, 2012; Greer & Meyen, 2009; Kirby et al., 2005; Saravanbhavan & Saravanbhavan, 2010). Teachers will not be able to sufficiently accommodate students with LD if their knowledge is limited (Kirby et al., 2005).

Saravanbhavan and Saravanbhavan (2010) noted that teachers who attended regular special education workshops scored the highest on the knowledge test about students with special needs. However, poor training influences teachers' knowledge of LD by not equipping teachers with the necessities they need in order to obtain the knowledge and skills required to best be effective in teaching students with a LD. Additionally, if teachers are not adequately trained and prepared to teach students with special needs, this can result in the teacher becoming overwhelmed and affect their teaching performance (Saravanbhavan & Saravanbhavan, 2010).

Teachers are aware of students with LD in the education system; however being overloaded with responsibilities and daily school routines along with lack of time prevent teachers from being able to help these students to the best of their ability or allow them

the time to conduct future research on how to best assist these students' learning needs (Aladwani & Al Shaye, 2012). Overload of work and the amount of responsibility teachers have affects their knowledge of LD, as often they are too busy or they have too many requirements so that they do not have time to spend on understanding LD and doing their own personal research or observation of LD. In a classroom, there are many needs and demands on the teacher. Between lesson planning, marking and assessing students, extracurricular activities, and so on, there can be very little time for teachers to research LD, nor does it become a top priority if there are other responsibilities that need to be completed first. The lack of time for professional development on LD influences teachers' knowledge of LD, as teachers have not been able to attend professional development sessions. This affects teachers' level of knowledge as they might not be up to date on current progression made in identifying and teaching techniques that are effective for students with LD. As a result they might not be fully aware of the most current information available about LD, particularly relating to new teaching strategies.

Teachers' limited knowledge of LD and overload of work can be addressed through collaboration with other educators. When collaboration occurs between regular classroom teachers and special education teachers it can benefit students with a LD. Gromoll's (2008) research on teachers' perception of students with the achievement characteristics of LD found that when collaboration occurs there is an increase in the effectiveness in meeting the needs of students with LDs on statewide assessments. This increase in effectiveness is a result of teachers learning from one another and assisting each other with teaching techniques, resources and ideas to assist their students. Further research is required to determine whether collaboration will also effectively meet the needs of

students with LD in their regular classroom.

Teachers' misunderstanding of special education terms and the amount of responsibility put onto them influence teachers' level of knowledge. Teachers may perceive that their understanding of LD is accurate, although in actuality it might be inaccurate or incorrect, contributing to teachers' confusion about the disability. Furthermore, teachers' misunderstanding of LDs can lead to a negative attitude towards students who have a LD (Saravanbhavan & Saravanbhavan, 2010). Gromoll (2008) noted that some teachers have negative attitudes towards students with LD that can cause everlasting effects on students with LD; including increased academic and behavioral problems. Additionally, when teachers expect students with LD to have low academic performance, they provide students with low academic marks and have low expectations of the students with LD (Gromoll, 2008). Gromoll did determine that teachers' perceptions and beliefs do play a very significant role in student achievement. Additionally, Woloshyn, Bennett and Berrill (2003) conducted research examining Ontario teacher candidates' perception of their preparedness to teach students with a LD and concluded that the teacher candidates were apprehensive about their ability to assess, identify and create a learning program for students with a LD in their classroom. (Woloshyn et al., 2003). Moreover, Greer and Meyen, (2009) noted that teachers' knowledge of LD is essential to translating curriculum expectations into content taught to students, meaning the more teachers know about LD, the more they are able to take the curriculum expectations that they need to teach the students and put the content into a format that will be most effective for the students' learning needs.

Research indicates that academic success for students with LD is directly tied to

their teachers' ability to identify and assist students' with LD (Aladwani & Shaye, 2012; Saravanbhavan and Saravanbhavan, 2010). Interestingly, Kirby et al.'s (2005) research examined physicians' and teachers' level of knowledge. The purpose of their research was the examination of a labeling culture that has resulted in confusion over the terms and difficulties encountered by students with LD. Kirby et al. stated "teachers will not be able to recognize or accommodate the children with learning difficulties in class if their knowledge is limited" (p. 126). They found that teachers identified more correct statements about LD than general practitioners. However, Kirby et al. also stated that both the teachers' and general practitioners' knowledge was limited. In the participants' responses' only 1% of teachers and none of general practitioners were able to expand beyond a general definition of a learning disability when defining the term, meaning that the correct responses gave only a brief awareness of the LD and did not give a detailed definition of what the LD specifically was, how it affected the individual with that form of LD, nor were they able to give detailed characteristics and educational strategies.

Kirby et al. (2005) stated that it is important to determine teachers' level of knowledge in regards to LD because, if their level of knowledge is inadequate, they will not be able to identify and accommodate students who are in need. Furthermore, Kirby et al. stated, "It is important to identify children with specific disabilities, as there is evidence that suggests that there are long-term outcomes for those who do not receive adequate intervention" (p. 126). These long-term outcomes for students who do not receive intervention include emotional and psychological problems in adulthood (Kirby et al., 2005). As a result, it is essential that primary teachers have sufficient knowledge about LD so that they can identify students early and therefore prevent these long-term

risks from occurring.

Inclusion

Inclusion has been a main focus in education for the last two decades as it gives every student, including those with disabilities, the opportunity to participate in a regular classroom education (Hsien et al., 2009). An inclusive education may be defined as ensuring the supports to:

> • welcome and include all learners, in all of their diversity and exceptionalities, in the regular classroom, in the neighbourhood school with their age peers:
>
> • foster the participation and fullest possible development of all learners' human potential; and
>
> • foster the participation of all learners in socially valuing relationships with diverse peers and adults. Where a student, regardless of disability, needs individualized attention and support from their teacher to address difficulties with the curriculum on any given day, it should be for as brief a period of time as possible with an active plan to reintegrate the student back into the regular classroom as soon as possible with appropriate supports for the teacher and student. (Crawford, 2005, p.6–7)

Furthermore, in 2006 at The United Nations Convention on the Rights of Persons with Disabilities it was recognized that individuals with a disability were permitted to be fully included in educational settings (United Nations, 2006; Gallagher & Bennett, 2013). In Ontario's Education Act, Regulation 181/98 states that the first choice for students with a disability should be that they are integrated into the regular classroom (Ontario Ministry

of Education, 2005). Meanwhile, in the United States, the IDEA declares that students with disabilities have the right to be educated in the regular classroom along with typically developed students (Antoinette, 2002). Despite these mandates, it is the teachers' knowledge, attitudes and beliefs that determine the success of the inclusion of special needs students in the classroom.

Hsien et al. (2009) conducted research examining attitudes and beliefs of early intervention teachers (both regular classroom teachers and special education teachers) in regards to the concept of inclusion in the regular classroom. Hsien et al. concluded that teachers who had postgraduate qualifications in special education had a more positive attitude towards inclusion and were more likely to indicate that inclusion marked a positive change made to the education system. However, a positive attitude towards inclusion of students with exceptionalities in a regular classroom is the norm among teachers, not just teachers who had postgraduate qualifications in special education; in addition, teachers want to include students with exceptionalities into their classroom (Bennett, 2009). Teachers' positive attitudes towards inclusive classrooms are a result of their belief that they are able to make adjustments to their teaching so that all students can succeed academically.

Like Bennett (2009), Jordan, Schwartz, and McGhie-Richmond (2009) also note the connection between teachers' views and inclusive classrooms. Through the literature that they examined (nearly two decades worth), Jordan et al. determined that successful inclusion practices were dependent on: teachers' views towards inclusion; teachers' views of the specific disability; and the teachers' concept of their role and responsibility in working with special needs students. They also determined that the success of

inclusion is based on the teachers' practice, understanding of the different disabilities that are in their inclusive classroom, and their beliefs and attitudes towards inclusion. Based on the studies mentioned previously in this section, some researchers seem to have found a connection between positive attitudes and teachers' knowledge, as indicated by more qualifications in special education and demonstrating the importance of knowledge.

Inclusion of students with a LD cannot only be successful for the student with a LD but also for the other students in the classroom. Simmons, Kameenui, and Chard (1998) examined the different assumptions teachers make about students with LD. They found that teachers made the assumption that a reading disability was the most common classification of LD, which contradicted Mayes and Calhoun's (2007) findings that the most common classification of LD is in written expression. Therefore, they often direct their teaching to assist students with LD in reading rather than writing. In addition, the teachers assume that they need to make specific instructions that are detailed and given only to students with LD. Nevertheless, these differentiated instructions also benefit other students, not just the students with LD in the classroom. Overall, the surveyed teachers felt confident in their ability to improve their instruction to assist students with LD (Simmons et al., 1998).

Jordan et al. (2009) discussed how, in the case of students with special needs, inclusion has been successful for their academic and social development. They stated that students with special needs who spent more time in a regular classroom received higher marks on achievement tests than their peers with special needs, who were not part of an inclusive classroom. Often their marks were closer to the students' appropriate grade levels. Jordan et al. (2009) noted the academic and social success gained by students who

have a LD in an inclusive classroom was significantly greater than that of their peers educated in a segregated classroom. Bennett and Gallagher stated that there is no evidence of general education students who are in an inclusive classroom obtaining a loss in their academic achievement. Additionally, Salend & Duhaney (1999) noted that the typically developing students who are educated in an inclusive classroom with students who have a LD did not experience any academic interference. This could be a result of the students with special needs having access to a variety of support and teaching strategies used in the inclusive classroom (Jordan et al., 2009). For example, teachers may be using more effective teaching strategies, such as differentiated instruction, in an inclusive classroom to meet the many different learning levels. Special needs students who are in an inclusive classroom are more likely to attend school and interact with peers and can also learn academically from these interactions (Jordan et al., 2009). Jordan et al. noted that the schools that have the most support available to their students and staff have a higher achievement rate for those students with special needs in an inclusive environment. In conclusion, the success of the inclusion of students with LD into the regular classroom is a result of the classroom teachers' attitudes and knowledge about LD.

Research Questions

The research questions that have been created based on the literature review are:

1. What level of knowledge do primary teachers have about LD?
2. Where do teachers get their knowledge about LD?
3. Do primary teachers believe they fully understand LD?
4. How frequently do elementary school teachers receive additional support for

students with LD at school?

5. Are teachers comfortable teaching students with LD? Do they feel prepared enough to teach?

These research questions were created by examining the content that was found during the literature review conducted on the topic of LD and teachers' knowledge of LD. During the literature review there were numerous publications that discussed teachers' attitudes and perception of LD. Additionally, some of the researchers expressed that teachers' knowledge of LD influenced teachers' attitudes and perceptions of the disability. However, there was very little literature that examined in detail the level of knowledge teachers had about LD. Furthermore, research examined in the literature review discussed the importance of early intervention and early identification of LD linked to the academic success of a student with LD. The link that was presented was that the earlier students are identified with a LD, the greater likelihood of those students succeeding academically (Stanton-Chapman, & Scott, 2001). Primary school teachers are the first educators to come in contact with students in our education system. As a result of the context presented in the literature, it was determined that one of the research questions should examine the level of knowledge primary teachers have about LD.

Additionally research questions were also created by the context that was discussed in the literature review. The second research question, asking about where teachers obtained their knowledge of LD, was a result of Saravanbhavan and Saravanbhavan's (2010) study that discovered that teachers who attended a workshop knew more about LD. Additionally, in the theoretical justification for the study, Desforges (1995) discussed how he believes teachers gain their knowledge of LD from their years of experience in

the classroom. Therefore, the second research question was established based on the different literatures expressing different content in which teachers obtain their knowledge about LD.

The third research question examines if primary teachers believe they fully understand LD. This question is important to examine as many of the publications (e.g., Abercrombie, 2009; Campbell et al., 2003; Clark, 1997; Hsien et al., 2009; Jordan et al., 2009) that examined teachers attitudes and perceptions talked about teachers' opinions affecting how they teach students with LD. The articles additionally discussed how teachers' attitudes affect their understanding and knowledge of LD.

The fourth research question examines how frequently elementary school teachers receive additional support for students with LD at school. This is important to investigate to see if teachers are getting adequate support for teaching students with LD. If teachers are not getting the support needed, it then reflects back on the type of education the students with LD are receiving (Aladwani & Al Shaye, 2012).

The last research question examines if teachers are comfortable teaching students with LD and whether teachers feel they are prepared enough to teach students with LD. This question was important to examine, as how teachers feel (comfort level and preparedness) has an impact on how they educate students with LD (Saravanbhavan & Saravanbhavan, 2010). Additionally, these variables might also impact teachers' level of knowledge, and how they feel might cause teachers to take action to obtain more knowledge about LD.

Chapter Three: Methodology

The research method that was used in this thesis was a quantitative study using an Internet survey to collect the data from the participants. A number of steps were conducted in order to obtain and analyze the data. The reason why quantitative data were selected for this research is because quantitative research is normally used to collect data to examine a trend that is occurring (Creswell, 2012). Quantitative research is also used to investigate a large population, as it allows researchers to determine a general trend in the population (Sandelowski, 2000). Therefore, in order to answer the previously mentioned research questions, the general trend of primary school teachers' knowledge of LD needs to be determined. In quantitative research, researchers use an instrument to collect data, such as a survey (Sandelowski, 2000).

Survey/questionnaire research is a widely used method to collect data in a number of different areas, including education (Zhang, 2000). There are a number of strengths to using survey research as an instrument to collect data. One benefit includes the ability of researchers to administer surveys to a large population of people (Whetstone & Carr-Chellman, 2001). Additionally, researchers are able to send out surveys and collect the data in a relatively short period of time (Zhang, 2000). Furthermore, surveys allow researchers to determine trends, attitudes, and behaviours in education (Whetstone & Carr-Chellman, 2001). Administering a survey to a sample (small group of the population, which in this study is primary school teachers) allows the researcher to acquire a general overall trend of teachers' knowledge of LD (Creswell, 2012). There have been a number of different research studies that examined teachers' perspectives, attitudes, and level of subject knowledge in which the instrument used to collect the

research was a survey. Reeves (2006) used a survey "to gauge teacher attitudes and perceptions of ELL inclusion" (p. 133). Whetstone and Carr-Chellman (2001) used a survey research design to collect data on preservice teachers' perceptions about technology. Since the purpose of this study is to examine primary teachers' knowledge of LD, a survey was used as the tool to collect the data.

Joy (2007) discussed the two basic types of surveys: longitudinal and cross-sectional. Longitudinal surveys are used to study individuals over a period of time, where as cross-sectional surveys are used to collect data about current trends, attitudes, or opinions that are occurring (Creswell, 2012; Joy, 2007). For the purpose of answering the stated research questions, a web-based, cross-sectional questionnaire was used as it allows the researcher to gather data about a current trend of a population. A web-based questionnaire is a survey administered through the Internet (Creswell, 2012; Zhang, 2000).

The traditional survey method was the postal survey, in which paper copies of a questionnaire are sent by post or courier to participants and then returned to the investigators via post or courier. Today, the Internet provides many opportunities for investigators looking to collect data in an effective and efficient manner (Zhang, 2000). The Internet not only provides a rich source of information to educators and researchers, but it also provides a means of communicating this information (Zhang, 2000). This means of communication allows researchers to use a new, more modern form of survey research by sending out web-based surveys through the Internet (Zhang, 2000). Often researchers send individuals e-mails with the survey in them (Zhang, 2000). However, there are often many Internet-based programs now that can allow individuals access to

different surveys, such as Survey Monkey or Fluid Surveys. Moreover, compared to postal surveys, the response rate for Internet surveys is higher and the surveys are faster and cheaper to administer, as the researcher does not have to pay the postal cost (Fricker & Schonlau, 2002; Kaplowitz, Hadlock, & Levine, 2004).

When deciding on what method of survey would work best for a study, the researcher needs to keep in mind the advantages and disadvantages to each approach. Using the Internet to conduct research raises a number of challenges that would not have been present in traditional postal survey methods (Andrews et al., 2003). Andrews et al. (2003) noted that a challenge of using Internet survey is that the paper-based quality of surveys cannot always be transferred onto Internet surveys. This is because when completing an Internet survey, if participants are unsure of the answer, they could more easily search the Internet while completing the survey. In this research, to ensure this did not happen, a time was marked for each survey to see how long it took the participant to complete the survey. If it took the participant significantly longer to complete the survey compared to other participants, the researcher examined if the survey was completed unfairly (research answers on-line before submitting) and then did not include that survey into the data analysis. Also, if, as a part of a survey, the researcher is examining participants' spelling and punctuation, when completing the survey on a computer often spellcheck automatically corrects the participant's spelling and therefore can affect the accuracy of the data. For the purpose of this research, spelling and grammar of participants in the survey did not matter. As a result, spelling and grammar did not affect the results of the data collection and analysis. Additionally, Zhang (2000) noted that all participants might not have equal access to the Internet or any required software in order

to complete the surveys. Furthermore, Kapowitz et al. stated that there are people who may not know how to use the Internet or are not comfortable using the Internet, resulting in their not completing the questionnaire. Moreover, Kaplomitz, Hadlock and Levine (2004), stated that because of Internet security, surveys might not reach the participants and instead end up in their spam or junk mail.

There have been many improvements in the development of Internet surveys. However, K. B. Wright (2005) noted that some Internet surveys can be very time-consuming in their creation. Furthermore, Wright noted that not all groups allow their e-mail list to be given to researchers, making it difficult to contact target participants. As a result, the survey was administered through teachers' Facebook pages so that the survey did not need to be e-mailed to a set list of possible participants. Moreover, Andrews et al. (2003) stated that a concern with Internet surveys is that it is possible to have individuals who are not in your population complete the survey. To ensure participants were from the population that the research is focused on, there is a demographic portion of the survey that asks specific questions, such as whether the participant is a teacher and what grade the participant teaches. For those participant responses that do not qualify in the study population, responses were not included in data analysis.

Wright (2005) explained that in order to get better response rates, researchers could offer a financial incentive, such as a gift certificate, to those participants who complete the survey. The low response rate does not only affect Internet surveys but all surveys that are administered to individuals. As a result, in both postal and Internet administered surveys, a financial incentive is one way the researcher could promote participation to receive a higher response rate. Furthermore, Wright stated that adding a postal reminder

or another method to remind participants to complete the survey has also been proven to increase the response rates for the survey. As a result, for this survey five participants were randomly selected to receive a $20 gift card to Chapters.

Though there were a number of negatives for Internet surveys, the list of benefits of using Internet surveys is larger. One of the most cited benefits of using Internet surveys is the low research cost. Unlike postal surveys where researchers have to pay for paper, envelopes, postal stamps, and return postal stamps, Internet surveys have very little cost (Kaplowitz et al., 2004; Wright, 2005; Zhang, 2000). Second, Internet surveys generally have a shorter response time compared to postal surveys. This shorter response time allows the researcher to collect the data more quickly and therefore be able to start analyzing the data sooner (Wright, 2005; Zhang, 2000). Third, by using an Internet survey, the researcher is able to have participants respond from geographically remote areas and thus the researcher is not confined to a specific region (Wright, 2005; Zhang, 2000). Fourth, Zhang (2000) listed the advantage of being able to survey people who are in a group with a sensitive nature, which in any other case would be more difficult to identify or contact (for example, gays, lesbians, drug users, etc.). Internet surveys allow researchers to efficiently survey a large number of people (Zhang, 2000). Last, transcribing and coding errors are minimal (Zhang, 2000) because many Internet survey programs automatically collect and sort the data, therefore limiting the possible human error that may occur when manually inputting the data (Wright, 2005).

Why Internet Surveys Were Used to Answer the Research Questions

There are a number of reasons why Internet survey research was selected for this research on primary teachers' knowledge about LD. One reason why survey research was

selected was that many other studies examining teachers' attitudes and opinions had previously used surveys to collect their data. Therefore, there are a number of surveys published that can be used as guidelines in order to create a survey that will collect information about teachers' knowledge. A second reason why Internet survey research was selected is that it allows the researcher to collect data from a large population in a short period of time. Therefore, the researcher can get data on a general trend of teacher knowledge without having to spend an extended period of time collecting the data. Furthermore, conducting Internet research not only cuts down the time it takes to send the instrument to the participants, but it also limits the cost of collecting the data.

A fourth reason why the researcher determined that a survey would be most appropriate to collect the data is that teachers are often very busy and have a lot going on. As a result it can be difficult to get teachers to do an interview or another form of research collection that would take an extended period of time. Therefore, the researcher decided that an Internet survey would result in teachers having easy access to the surveys and the survey would not take an extended period of time. This is an important consideration, as the amount of time it takes to complete a survey can often be a factor for why teachers do not complete the survey. Furthermore, by e-mailing the survey, it also takes less time for teachers, as they do not have to write but can type their response and, when they have completed the survey, they have to select *send* and are done, unlike with postal surveys where participants not only have to complete the survey, but then they also have to mail the survey back to the researcher. Therefore, because of the aforementioned benefits, I determined that the most appropriate research method to collect the data would be an Internet survey.

Developing the Survey

When developing the survey to address the five stated research questions, a lot of thought and exploration of different literature occurred to create the most effective and efficient survey. When exploring previously administered surveys for research that examined teachers' knowledge, attitudes, opinions, or perspectives, it was discovered that each survey had two sections. One section was a demographic portion, and the other section had questions regarding the information the researchers were trying to target (Wright, 2008). When creating the survey for this research, a number of previously used surveys were examined to give me ideas as to what questions should be in the survey. Ko (2007) and Parker (2006) both included questions regarding the participants' gender, level of education, and amount of teaching experience in the demographic portion of their surveys. As a result, I included similar types of questions in the demographic portion of my survey. This information is important when it comes to analyzing the data as it allows me to determine demographic influences that might affect teachers' knowledge of LD. Therefore, when answering the research questions about what level of knowledge primary teachers' have of LD, I can determine if a correlation exists between teachers' level of knowledge and their teaching experience.

The first section of my survey was called Part I: Learning Disability Knowledge Survey. For the development of these questions, recommendations from surveys conducted by Brown (2007) and Wright (2008) were used because these surveys researched similar content to the present research. The remaining questions were developed based on the literature review. For the questions in the Part I: Learning Disability Opinion Survey section of the survey, a Likert scale was used. There was one

question in which the Likert scale was not used as it is an open-ended question asking participants what they would do in a certain situation. A Likert scale is a common type of tool used in educational research (Clason & Dormody, 1994) because it is easy to construct and there are fewer statistical assumptions (Karavas-Doukas, 1996). Likert first proposed a summate scale to assess participants' attitudes (Clason & Dormody, 1994). Likert's scale has five responses a participant can choose: strongly approve, approve, undecided, disapprove, and strongly disapprove (Clason & Dormody, 1994), although Likert did note that the number of responses does not have to be limited to these five categories. Using a Likert scale in the survey allows the researcher to obtain a better understanding of the participant's answer to a question than a simple yes or no answer. Using an attitude scale, such as the Likert, allows one to use a measuring device in which the participant must express his/her degree of disagreement or agreement to the statement given (Karavas-Doukas, 1996).

One last consideration that occurred when creating the survey was which section to put first. It was determined that it was more beneficial to put the opinion section first and the demographic section second. The reason is that if the demographic section was first, participants might be a little hesitant to answer all questions honestly as they are not sure what will be asked in the remainder of the survey. However, by having the demographic section second, it allows the participants to have already completed the opinion section of the survey; therefore they know what questions were asked and will more likely be more honest in this section. Finally, additionally, the survey was carefully reviewed to ensure that participants could understand the statement and that the statement answers could be analyzed so that they would answer the five stated research questions

Steps Used to Collect Research

The first step in collecting the data was to determine who the participants in the study would be. The participants selected for this study were Ontario primary school teachers. For the purpose of this study, "primary school teachers" will be the term used to describe teachers teaching kindergarten to grade 3 students. The participants were contacted through the following on-line teacher Facebook pages: Nipissing University Teachers, Ontario Occasional Teachers, Ontario Teachers (Primary)- resource and idea sharing, Ontario Teachers – resource and idea sharing, as well as through my (Julie Kocsis) and Dr. Lorraine Frost's personal Facebook pages. Additionally, Dr. Lorraine Frost sent out an e-mail to Nipissing University Schulich School of Education faculty asking them to advertise the survey to primary teachers they know.

There are a number of reasons for choosing this process. One reason is that by distributing the surveys to primary school teachers on Facebook, I had direct access to potential participants. Additionally, professors and teachers on Facebook were able to share the survey with past students or colleagues who they thought would qualify to complete the survey. The participants were able to see the letter addressing the purpose for the research and decide if they were willing to participate or not in the research. A second reason is that I had immediate access to participants. Therefore, multiple different school boards did not need to be contacted for approval for teachers' in their school boards to participant in the study. Facebook offered a variety of other benefits, for example it was able to contact a larger variety of primary teachers from all across Ontario. Therefore my research does not focus on a specific school board or geographical region. However, there was also the disadvantage that teachers who were

not members of the selected Facebook groups did not have access to the survey unless the survey was e-mailed to them. Additionally, people may have completed the survey that did not meet my criteria for my research. An additional disadvantage is that there may be respondents outside of Ontario. These problems were controlled for in the survey by collecting demographic details, whereby surveys that did not meet the research criteria were discarded.

The second step was to determine what instrument would be used to collect the data. For this study a cross-sectional Internet Facebook survey was used, developed with Fluid Survey. Fluid Survey was used instead of a different program because it was a Canadian-based program that the Nipissing University Research Ethics Board approved for using based on participants' privacy. The average time it took participants to complete the survey was 15 minutes and 47 seconds

The final step when conducting survey research is to report my results. In addition to writing my thesis, I created a final report about the research to be disseminated to participants who requested a copy. In the final report there are charts, quotes, and statistics used to show the readers the results of data and how they answered the research questions. Moreover, in the final report there is an interpretation of the results and a discussion of what the results mean. Furthermore, there is a statement on how the results relate to current education and suggested future steps in education but also in further research in this same area.

Study Sample

The sample population for this study was selected from a number of teacher Facebook groups. Prior to putting the research survey on the group page, the

administrators of these Facebook groups were contacted for permission. The participants were offered a chance to win one of five $20 gift cards to Chapters. This was offered to help with the response rate of the participants. The survey was administered in October 2014; it was determined that during October teachers would be less busy with the rush of the beginning of the school year and there would be a little bit of down time before report cards begin. For the purpose of collecting the information, I aimed for a sample population with at least 50 completed surveys. However this target was surpassed with 187 respondents completing the survey. Of the 187 only the 144 respondents who were currently Ontario primary teachers or taught primary classes in Ontario within the last two years were included in the study.

Description and Preparation

Fluid Survey sorts the data into an Excel spreadsheet that can be imported into SPSS. SPSS is a quantitative computer software analysis program. The responses were examined and any responses that were from participants who were not primary school teachers were removed from the data so that they did not influence the results.

I used the software program SPSS Version 22 and the data analysis tools in Fluid Survey to analyze my data. Some of the analyses I completed on the data in order to get answers for the research questions are: frequency, ANOVA, and chi-square analysis. The first analysis I conducted was a frequency test; the reason for this is that it gives me an initial overview of the data collected. I was able to determine the mean, median, and mode of responses, along with examining the frequency distribution of each response. Furthermore, through the frequency analysis I could also determine primary teachers' confidence in their responses by examining how many participants strongly

agreed/disagreed to a statement compared to those who stated they agreed/disagreed. Additionally, a chi-square test of independence was used to determine if an independent variable affected teachers' knowledge of LD. Therefore, a chi-square analysis was used to determine if there was a significant difference between two variables that were examined. A chi-square could only be conducted when there were two variables (i.e., through participants who had a family member with a LD and those participants who did not have a family member with a LD). As a result a chi-square analysis was conducted when the following variables were examined: participants with family members who have LD, participants with close friends who have a LD, and participants attending workshops on LD. Finally, an ANOVA was used when chi-square analysis could not be conducted. An ANOVA is used to see if independent variables such as years of teaching experience and grade teachers taught influenced primary teachers' knowledge of LD. An ANOVA determined if there was a significant relationship among the responses in the different categories being analyzed, therefore determining if the variable being examined affected teachers' knowledge of LD. An ANOVA was used instead of a chi-square in circumstances where there were more than two categories that were being examined (i.e., years of teaching experiences: 5 or less, 6 to 10, 11 to 15, 16 to 20, etc.).

Ethical Considerations

An ethical concern in this research would be the protection of individuals' identification. This survey was anonymous. The only situation in which contact information was received is when a participant wanted to receive a report of the survey, and at this point the participants provided an e-mail address for the information to be sent. With Fluid Survey, it is possible to separate the survey from the request for a report.

Chapter Four: Results of the Study

The purpose of this study was to examine primary teachers' knowledge of LD. The reason this study examined primary teachers' knowledge was because in many studies, such as Reschly (2005), Scruggs and Mastropieri (2002), and Felton (1992), the researchers determined that the earlier a student with a LD is diagnosed, the more likely he/she is to succeed academically in his/her future education. As a result, primary school teachers are among the first educators to come in contact with students and therefore are the first teachers who would have the opportunity to distinguish if a student possibly has a LD. Primary school teachers can then be the first to intervene and to make accommodations and modifications to students' learning to help them succeed academically. Therefore it was determined to examine primary teachers' level of knowledge about LD.

For this research there was an expectation that approximately 50 individuals would complete the survey. However, there were 154 qualified participants who completed the full questionnaire and an additional 34 participants completed the majority of the questionnaire. Therefore, the total number of participants in this data collection was 187. I did not reject the participants who did not complete the entire survey their results were still valid. These participants completed the majority of the questions and skipped or did not complete less than 5 questions on the survey. As a result, Fluid Survey marked their survey responses as incomplete; however they still had provided a sufficient amount of information for effective analysis to be conducted with their responses.

Part One: Demographics of Participants

It is important to develop a clear understanding of the demographics of the participants prior to examining the results of the survey. Therefore, in Part One of the results, the demographics of the participants will be examined.

Demographic Profile of Participants

The survey was administered through four different Facebook pages, as well as posted on my personal Facebook wall; consequently the participants could have been from around the world and were not directly from one school board, area, or country. However, when examining the participants' location, 82% of the participants were from Ontario, while the remaining 18% of participants were from other provinces or territories in Canada or other regions around the world (including United Kingdom, Cambodia, China, Honduras, Hong Kong, South Korea, and Netherlands). Of the large majority of participants being from Ontario and a very small minority from other regions around the world, it was determined that only the responses from participants from Ontario would be analyzed, as this would allow a more accurate analysis of a specific group of primary teachers (primary teachers in Ontario) and a more in-depth analysis of Ontario primary teachers' knowledge of LD. The final study population was 143 participants and all remaining analysis was based on the responses of these 143 participants (female: n = 137, 96.5%; male: n = 5, 3.5%).

The disproportionate number of female participants may be considered a limitation of the data; however, the uneven distribution may be reflective of the fact that there are more female teachers in primary grades than male teachers. This is substantiated by a Statistics Canada 2006 report that indicated that at the preschool and primary level

there were 218, 740 female teachers and 42, 935 male teachers (Canada, 2013). That means that 86.3% of primary teachers were females and 16.4% of primary teachers were male (Canada, 2013). Though these proportions are not the same as the proportions from this survey, it does help explain the huge gender difference in respondents.

Current Teaching Position

All of the 143 participants in the study were teaching in an elementary school in Ontario. Of those 143 participants, 72.8% had a full-time teaching position, 8.8% had a part-time teaching position, and the remaining 18.4% of the participants were supply teachers who worked mostly with primary students or were long-term occasional teachers working with primary students. Table 1 depicts that the majority of the participants (75.5%) were general education teachers (regular classroom teachers), while 12.6% of the participants were special education teachers. Of the 11.8% participants who responded *other*, a couple were vice-principals who also taught some primary planning time, 9.7% primary planning time teachers[1], 1.4% music teachers, and 1.4% were French teachers who teach primary students on a regular basis.

[1] Primary planning time teachers are teachers who teach a variety of different subjects and classes, as they come into a regular classroom to teach while the regular classroom teacher recesses a period to do lesson planning, marking, and any preparation for his/her class.

Table 1

Frequency Distribution of Type of Educator

Variables	Number	Percentage
Type of educator		
General education teacher	108	75.5
Special education teacher	18	12.6
Other	17	11.8
Total	143	100

Table 2 presents the participants' teaching position at the time of completing the survey. Sixty percent of the respondents responded *other* to this question and also provided a description of their current teaching position. The majority of participants responded *other* because they were teaching split grades, primary special education, or were a primary planning time teacher. I analyzed the written *other* comments and sorted them into different categories which were included in the analysis. As a result, a number of the categories were added after analyzing the data. A recommendation for improving this survey would be to add additional options, such as a mixture of the above and split grades. Overall there was a good mixture of different types of primary teachers who participated in the survey. The 11.9% of participants that were still in the *other* category included participants who were on maternity leave, participants who taught a mixture of special education and planning time, or the participants who did not identify their current teaching position. Years

Table 2

Frequency Distribution of Current Teaching Position

Variables	Number	Percentage
Current teaching position		
Pre/junior kindergarten (age 4)	3	2.1
Senior kindergarten (age 5)	6	4.2
Grade 1	13	9.1
Grade 2	16	11.2
Grade 3	16	11.2
Other	17	11.9
Primary special education teacher	12	8.4
Primary planning time teacher	14	9.8
Primary supply/substitute teacher	6	4.2
Primary French	2	1.4
Grades SK/JK	9	6.3
Grades SK/1	2	1.4
Grades 1/2	3	2.1
Grades 2/3	5	3.5
Grades 3/4	4	2.8
Grades 1/2/3	3	2.1
All of the above	7	4.9
Taught primary in the past	5	3.5
Total responses	143	100.0

Table 3 displays the years the participants in the survey have taught. The majority of the participants were within their first 10 years of teaching, with 40.1% of the participants being within their first five years of teaching and only 3.4% of participants have taught more than 20 years. This is an important point to considerate when analyzing

the data, as the majority of teachers are in the beginning stages of their careers and there is not an even spread of participants throughout their careers. This disparity may be attributed to the fact that younger teachers are more likely to be on social media and use social media than older teachers (Duggan & Brenner, 2013). Since the survey was administered through Facebook, the younger teachers (less experienced teachers) might be more likely to have Facebook accounts compared to older teachers who may not feel comfortable using the social media website. These variables may explain why there were so few participants who have been teaching for more than 25 years.

Table 3

Years of Teaching (Intervals)

Variables	Number	Percent
Years of experience intervals		
1–5	59	40.1
6–10	41	27.9
11–15	23	15.6
16–20	7	4.8
21–25	3	2.0
26–30	2	1.4
No response	12	8.1
Total	147	100.0%

Professional Development

Teachers are strongly encouraged throughout their careers to continue learning and to participate in some form of professional development. This can include professional development courses, workshops, or conducting their own personal reading or research. Of the 143 participants in the survey, 115 (85.2%) of the participants stated that they had participated in some form of professional development, such as attending a

course or conference, to improve their knowledge of special education. A possible explanation for the high number of participants partaking in professional development is that fact that school boards often provide their schools with funds for professional development. Furthermore, there is a belief among teachers in Ontario that they will increase the likelihood of getting hired for a teaching job if they have completed their Special Education Part 1 course.

One method in which teachers can participate in professional development is by attending workshops. The majority of participants (61.2%) have attended at least one workshop on learning disabilities. Of those participants who attended a workshop on LD, 24.4% had attended one workshop on LD, 17.1% had attended two workshops, 13.4% had attended three workshops, 1.2% had attended four workshops, and 43.9% of participants had attended five or more workshops on LD. Workshops can be organized and presented by a teacher's school board, another school board, Ministry of Education, government, or another organization could have organized the workshops that the participants attended.

As a part of professional development, it is common for teachers to complete additional qualification courses and additional basic qualification courses. Of the 143 Ontario primary school teachers who participated in the study, 88.2% had taken or were currently enrolled in at least one additional course. A large majority (88.2%) of participants had completed at least one additional course in special education.

Of those participants who had taken at least one additional course in special education; 3.4% of participants had completed a half course (approximately 36 hours of course work), 46.6% of participants had completed one full course (approximately 72

hours of course work), 4.3% had completed 1.5 courses (approximately 108 hours of course work), 13.8% had completed 2 full courses (approximately 144 hours of course work), 1.5% had completed 2.5 courses (approximately 180 hours of course work), and 21.6% had completed 3 courses (approximately 216 hours of course work), and 8.6% of the participants selected the *other* option in this question and commented on their current course-related professional development. The majority of the participants completed one full course. Of the 10 participants who stated *other*, some were currently in the middle of a course or they had completed a specialist qualification. Additionally, one member also had completed a Master of Education.

A third method in which educators often participate in continuous professional development is through conducting their own personal research on special education topics. Only 27.7% of participants had conducted any personal research in the area of special education. However, even though 72.9% of participants answered *no* to this question, a number of participants stated that they had done some Internet-based searching about special education when they had a special needs student in their class or when they suspected one of their own children had a learning disability.

Finally, it is common for teachers to complete some reading on different topics they are teaching or have to deal with in their teaching. As a result, when participants were asked if they had ever completed any personal reading on special education, 75.4% stated they had, while 24.6% stated they had not. Many of the participants stated that they had read on-line articles about different disabilities and different teaching strategies to help students in the classroom. Furthermore, numerous participants had read books and

articles or books on autism, attention deficit hyperactivity disorder (ADHD), assistive technology, LD, and behavioural disorders.

Participants' Relationship with LD

One of the questions in the demographic section of the survey asked participants if they had a close friend with a LD. This question was important to include, as participants who have close friends or family members with a LD may have a different outlook and level of comprehension on the disability. Just over half of the participants (58.7%) stated they had either a close friend, sibling of a friend, or a roommate that had a LD. One possible reason why there were more respondents who had a friend with a LD compared to those who did not have a friend with a LD (41.3%) could be that those respondents that had a friend with a LD were more interested in the survey.

Participants were also asked if they had a family member with a LD. There was almost an even 50% split of participants who had and who did not have a family member with a LD, with 51% of participants stating they did have a family member with a LD and 49% of participants stating they did not have a family member with a LD. This is very interesting, and it also demonstrated that there was an even number of participants who had associated with people that had a LD on a regular basis outside of school and those who did not. Of those participants who stated they did have a family member with a LD, many of those individuals were mothers, brothers, sisters, children, cousins, or even themselves. There were also a number of participants who had multiple family members who were diagnosed with a LD.

Part Two: Knowledge of Learning Disabilities

In the section of the survey that examined teachers' knowledge of LD there were five parts: characteristics of LD, risk factors that cause LD, teaching strategies for students with LD, teaching students with LD, and support for teachers teaching students with LD. A Likert scale was used for participants to answer the questions in this section. Using the Likert scale allowed the researcher to assess the level of confidence that the respondents had in their answers. To conduct the analysis of this section, the data were coded and imported into SPSS for statistical analysis to be conducted. During the coding, the following codes were given to the responses from the Likert scale: 1 = *strongly disagree*, 2 = *disagree*, 3 = *don't know*, 4 = *agree*, and 5 = *strongly agree*. At the end of each section participants had the opportunity to use the provided textbox to record additional comments.

The first analysis that occurred in each part was a frequency analysis. This included the frequency, mean, median, and mode of the responses to each questions. Additionally there were five cross-analyses that were conducted during the analysis of the data. When conducting cross-analyses on the results, either a chi-square test or an ANOVA was conducted. A chi-square analysis was used during the cross-tab analysis because chi-square tests are used to determine if there is a significant difference between the expected frequency and the observed frequency in the data. A chi-square test was conducted when there were only two variables of data that were being analyzed, for example, those participates who did have a family member with a LD and those participants who did not have a family member with a LD. A chi-square test for independence between the two variables was used. For a chi-square test to be used you

have to combine the responses to make smaller groups. Therefore when a chi-square test was used in the analysis, the following codes were given to the Likert scale responses for chi-square analysis to be conducted: 1 = *strongly disagree/disagree*, 2 = *don't know*, 3 = *strongly agree/agree*.

An ANOVA test helps to determine if there are significant differences among responses in the different groups/categories that are being analyzed. ANOVA tests were used instead of a chi-square when there were more than two groups of categories required. For example, there were seven categories of teaching experience: 1 to 5 years, 6 to 10 years, 11 to 15 years, 16 to 20 years, 21 to 25 years, and 26 to 30 years. When conducting the ANOVA the following codes were given to the Likert scale responses to questions in the survey: 1 = *strongly disagree*, 2 = *disagree*, 3 = *don't know*, 4 = *agree*, and 5 = *strongly agree*. An ANOVA helps to determine if there is a significant relationship among the responses in the different groups/categories that are being analyzed.

The first cross-analysis examines teachers' years of experience and their knowledge of LD. When examining this cross-analysis, it was important to remember that approximately 77% of the respondents had been teaching for 10 years or less, with. 48% of the respondents being within their first 5 years of teaching. There were very few respondents who had taught longer than 10 years, and therefore that needed to be taken into consideration when examining the data. It is important to note that most teachers had fewer than 10 years teaching experience because, when analyzing the data we cannot assume with strong accuracy that the factor of years of *teaching experiences* affected teachers' responses to the questions. During this cross-analysis an ANOVA test was

conducted. The variables were split into seven categories of teacher experience for this ANOVA test to be conducted. The seven were; 1 to 5 years, 6 to 10 years, 11 to 15 years, 16 to 20 years, 21 to 25 years, and 26 to 30 years Additionally, a second cross-tab analysis examined if primary teachers' level of knowledge on LD depended on their teaching position. This is important to study, as it will give insight to determine if the grade teachers teach or the teaching position they have affects their level of knowledge about LD. For this cross-tab analysis, the different teaching positions were divided into nine sections: junior and/or senior kindergarten teachers, grade 1 teachers, grade 2 teachers, grade 3 teachers, split grade teachers (teachers who are teaching a split class, such as a grade 1/2 class), planning time/prep teachers, substitute/supply teachers, special education/resource teachers, and other (category for all other primary teacher participants who don't fall into the other eight categories). As a result of there being nine categories, an ANOVA test was administered.

The third cross-tab analysis examines if primary school teachers' level of knowledge differs depending on whether they have a family member with a LD or not. This is important to examine as it would determine if primary teacher level of knowledge about LD was dependent on whether the teacher had a family member with a LD or not. ANOVA tests were not used for this analysis because there were only two groups of participants (those with a family member with a LD and those who did not have a family member with a LD). As a result, a chi-square test for independence was used. Responses were combined to make smaller groups.

The fourth cross-analysis of the data assessed the responses from participants who had a close friend with a LD and those participants who did not have a close friend with a

LD. This was important to examine, as it would help determine if a correlation existed between primary teachers who have a close friend with a LD and teachers' level of knowledge about LD. A chi-square test was used in this cross-analysis.

The fifth cross-tab analysis of the data examined whether attending a workshop influenced teachers' level of knowledge about LD. This is important to investigate, as it will determine if workshops on LD are really useful and help provide important information about the disability to teachers. A chi-square test was conducted for this cross-analysis.

Characteristics of LD

Table 4 outlines the participants' knowledge about the characteristics of a LD (The frequency chart of participants' responses can be found in Appendix D, Table 4.1).

Table 4

Statistical Analysis of Participants' Responses to Characteristics of LD

Variable	Mean	Median	Mode
1. A learning disability can be expressed as a significant disability in reading.	4.45 *Agree*	5.00 *Strongly agree*	5 *Strongly agree*
2. A learning disability can be expressed as a significant disability in communication.	4.38 *Agree*	5.00 *Strongly agree*	5 *Strongly agree*
3. A learning disability can be expressed as a significant disability in written language.	4.51 *Half way between agree and strongly agree*	5.00 *Strongly agree*	5 *Strongly agree*
4. A learning disability can be expressed as a significant disability in mathematics.	4.40 *Agree*	5.00 *Strongly agree*	5 *Strongly agree*
5. A learning disability can be expressed as a significant disability in social skills.	3.85 *Agree*	4.00 *Agree*	4 *Agree*
6. A learning disability can be expressed as a significant disability in oral language.	4.32 *Agree*	4.00 *Agree*	5 *Strongly agree*
7. A person with a learning disability can also be identified with another disability.	4.69 *Strongly agree*	5.00 *Strongly agree*	5 *Strongly agree*
8. A person with a learning disability can also be identified as	4.54 *Strongly agree*	5.00 *Strongly agree*	5 *Strongly agree*

Variable	Mean	Median	Mode
gifted.			
9. Fidgeting is a typical characteristic of a student with a learning disability.	2.71 *Don't know*	2.00 *Disagree*	2 *Disagree*
10. Shouting out is a typical characteristic of a student with a learning disability.	2.31 *Disagree*	2.00 *Disagree*	2 *Disagree*
11. Hitting is a typical characteristic of a student with a learning disability.	2.07 *Disagree*	2.00 *Disagree*	2 *Disagree*
12. Slower processing speed is a typical characteristic of a student with a learning disability.	3.78 *Agree*	4.00 *Agree*	4 *Agree*
13. Difficulty comprehending written materials is a typical characteristic of a student with a learning disability.	3.84 *Agree*	4.00 *Agree*	4 *Agree*
14. Difficulty with sentence structure is a typical characteristics of a students with a learning disability	3.49 *Don't Know*	4.00 *Agree*	4 *Agree*
15. Excellent spelling is a typical characteristic of a student with a learning disability.	2.03 *Disagree*	2.00 *Disagree*	2 *Disagree*
16. Good ability to express ideas is a typical characteristic of a student with a learning disability.	2.41 *Disagree*	2.00 *Disagree*	2 *Disagree*
17. Difficulty copying notes from the chalkboard is a typical characteristic of a student with a learning disability.	3.52 *Agree*	4.00 *Agree*	4 *Agree*
18. Good ability to use phonics is a typical characteristic of a student with a learning disability.	2.20 *Disagree*	2.00 *Disagree*	2 *Disagree*
19. The severity of a student's learning disability fades with age.	1.76 *Disagree*	2.00 *Disagree*	2 *Disagree*
20. Atypical human growth is a characteristic of a student with a learning disability.	2.06 *Disagree*	2.00 *Disagree*	2 *Disagree*

When examining participants' level of knowledge on characteristics of LD, the majority of the participants (more than 70%) answered 19 out of the 20 LD characteristics, suggesting that primary school teachers have a more than adequate level of knowledge on characteristics of LD. The first six questions pertained to the specific types of LD (reading, writing, communication, and mathematics). The medians and modes of the responses to the first six questions indicated that the participants had more

confidence in these answers, as they responded *strongly agree* compared to the other questions which pertained to the typical characteristics of LD (questions 7 to 20). As a result, it seems that

primary school teachers are more confident in their knowledge of the different types of LD, compared to typical characteristics students with a LD might have.

Question 5 in this section asked if a learning disability could be expressed as a significant disability in social skills. When developing this question, the anticipated informed response was *disagree/strongly disagree* because a deficit in social skills is not a classification of LD. However, after examining the results and conducting further research on the topic of social skills and classification of LD, it was determined that there was no correct or incorrect response to this question. When examining the results displayed in Table 4, it can be noted that both the median and mode responses for this question were *agree* (4). Furthermore, a very small minority of the participants (21.7%) selected *disagree/strongly disagree* to the question compared to a large majority (76.3%) of respondents responding who selected *agree/strongly agree* (see Table 4.1 in Appendix D). When developing this survey to examine teachers' knowledge, questions one to five were created to examine primary teachers' knowledge of the different classifications of LD (reading, writing, communication, and mathematics). When a student with a LD has a significant disability in their social skills, it is generally the result of a secondary disability/diagnosis, such as Asperger (Learning Disabilities Association of Canada, 2015). As identified by Logan (2009) social skills is not a classification of LD with which an individual would be identified. However, because of the wording of the question, some participants may have viewed this question as not asking if social skills was a

classification of LD, but instead asking if someone with a LD could also have difficulties with their social skills. In that case, if a student is struggling in one or more of the classifications of LD (i.e. reading, writing, communication, and mathematics) it could affect the student's ability to interact with their peers. For example, if a student has a LD in communication that results in the student having troubles with oral expression and comprehensions, this would have an impact on the student's social interaction with their peers. A student who has a LD that affects oral expression and comprehension is less able to benefit from instructions given by parents, teachers or other care givers and therefore may not develop social skills in the way that other students do. The likelihood of a student solely being identified with a LD and that having a significant effect on their social skills is limited (Learning Disabilities Association of Canada, 2015). However, McKinney (1989) discovered in his research that students who have a LD were more likely to present maladaptive behaviours (i.e. acting out in class, not staying focused on work). Often students with a LD use maladaptive behaviours as an avoidance tactic, to either hide from their peers that they don't understand or cannot comprehend the concept being learned, or to distract themselves or others so that they do not have to do the work. Furthermore, while investigating the results for this question further I came across a publication by Kavale and Mostert (2004). Kavale and Mostert noted that in reality a significant number of youth with a LD have social problems; these social problems include; anxiety, motivation, social behaviours, social relationships, peer status, social cognition, classroom behavious, social adjustment, etc. Kavale and Mostert noted that there has been an increase in the recognition of deficits in social skills for students with specific LD. This recognition of deficits in social skills for students with LD has resulted

in some organizations changing their definition of LD. The Interagency Committee on Learning Disabilities in the United States now defines LD as "a generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities or of social skills" (Kavale & Mostert, 1989, p.32). This leads back to Seigel's(1999) original argument discussed in the literature review; because there is not one consistent, universal definition of LD, this question have no correct or incorrect answer. In the results from this research, the majority of participants states that students' with LD may display some form of social difficulty, which suggests that they subscribe to the view that having an LD may result in a student having some form of social difficulty.

Participants' responses to questions examining primary teachers' knowledge of typical characteristics of a student with a LD can be viewed in Table 4, questions 7 to 20. In all cases the mean, median, and mode suggest that participants were aware of the typical characteristics of a LD, therefore determining that Ontario primary teachers do have a more than adequate level of knowledge about typical characteristics a student with a LD might portray. However, when comparing these means, medians, and modes to the first six questions that examined teachers' knowledge of types of LD, it can be noted that their responses are not as *strongly agreed* or *strongly disagreed*. This suggests that teachers may not be as confident in their knowledge about typical characteristics of LD compared to their confidence in their knowledge of the different types of LD.

After this section on the survey, participants had the option to make any additional comments. Thirty-two of the participants added additional comments about

their views on typical characteristics of students with a LD. The participants indicated that the characteristics of a LD included: easily frustrated when not given appropriate accommodations or differentiations (accurate), shouting out (misconception), extremely good behaviour so teachers do not call on them (misconception), attention-seeking for things the students do well (misconception), developing self-help habits (misconception), confusion (accurate), marked discrepancy between student and age level peers in terms of quantity of work produced (accurate), spending greater time on task but output less than peers (accurate), difficulty understanding nonverbal communication (accurate), fighting (misconception), yelling (misconception), fidgeting (misconception), and humming/singing to self (misconception). According to the Learning Disabilities Association of Ontario, some of these suggested were typical characteristics of a student with a LD, while others are typical characteristics of another disability or typical childhood behaviours. However, a student with a LD can also have another disability; as a result people sometimes believe a characteristic that a person is portraying is because they have a LD, when actually it is a result of another disorder (Learning Disabilities Association of Ontario, 2007). Moreover, many participants commented on the term "typical characteristic" that was used in many of the questions. Many participants suggested that there was such a wide range of characteristics for students with LD that what was considered typical for some students may not be typical for other students. One participant noted, "students with a learning disability vary greatly in their strengths and weaknesses" (participant comment, 2014). Therefore, two participants responded that all characteristics addressed in the questions could be typical characteristics of a student with a LD.

In the first cross-analysis that was conducted, teachers' years of experience and their knowledge of LD was examined. Table 5 depicts the results of an ANOVA test conducted on teachers' years of experience and their level of knowledge on characteristics of LD. There was no relationship between teachers' years of experience and their level of knowledge on the characteristics of LD.

Table 5

Analysis of Variance Test on Teachers' Years of Experience and Their Level of Knowledge of Characteristics of LD.

		Sum of squares	*df*	Mean square	*F*	Sig.
1. A learning disability can be expressed as a significant disability in reading.	Between groups	1.116	5	.223	.394	.852
	Within groups	71.906	127	.566		
	Total	73.023	132			
2. A learning disability can be expressed as a significant disability in communication.	Between groups	1.828	5	.366	.492	.782
	Within groups	95.906	129	.743		
	Total	97.733	134			
3. A learning disability can be expressed as a significant disability in written language.	Between groups	1.253	5	.251	.571	.722
	Within groups	56.180	128	.439		
	Total	57.433	133			
4. A learning disability can be expressed as a significant disability in mathematics.	Between groups	2.512	5	.502	.765	.577
	Within groups	84.085	128	.657		
	Total	86.597	133			
5. A learning disability can be expressed as a significant disability in social skills.	Between groups	1.755	5	.351	.251	.939
	Within groups	180.571	129	1.400		
	Total	182.326	134			
6. A learning disability can be expressed as a significant disability in oral language.	Between groups	1.875	5	.375	.545	.742
	Within groups	88.762	129	.688		
	Total	90.637	134			
7. A person with a learning disability can also be identified with another disability.	Between groups	3.006	5	.601	1.781	.121
	Within groups	43.542	129	.338		
	Total	46.548	134			

		Sum of squares	*df*	Mean square	*F*	Sig.
8. A person with a learning disability can also be identified as gifted.	Between groups	3.046	5	.609	.909	.478
	Within groups	86.480	129	.670		
	Total	89.526	134			
9. Fidgeting is a typical characteristic of a student with a learning disability.	Between groups	7.013	5	1.403	1.093	.367
	Within groups	165.535	129	1.283		
	Total	172.548	134			
10. Shouting out is a typical characteristic of a student with a learning disability.	Between groups	4.731	5	.946	.917	.472
	Within groups	132.052	128	1.032		
	Total	136.784	133			
11. Hitting is a typical characteristic of a student with a learning disability.	Between groups	3.703	5	.741	.966	.441
	Within groups	98.934	129	.767		
	Total	102.637	134			
12. Slower processing speed is a typical characteristic of a student with a learning disability.	Between groups	9.024	5	1.805	1.543	.181
	Within groups	150.902	129	1.170		
	Total	159.926	134			
13. Difficulty comprehending written materials is a typical characteristic of a student with a learning disability.	Between groups	5.874	5	1.175	1.144	.341
	Within groups	132.497	129	1.027		
	Total	138.370	134			
14. Difficulty with sentence structure is a typical characteristic of a student with a learning disability.	Between groups	2.447	5	.489	.402	.847
	Within groups	157.256	129	1.219		
	Total	159.704	134			
15. Excellent spelling is a typical characteristic of a student with a learning disability.	Between groups	4.249	5	.850	1.159	.333
	Within groups	94.565	129	.733		
	Total	98.815	134			
16. Good ability to express ideas is a typical characteristic of a student with a learning disability.	Between groups	2.516	5	.503	.457	.808
	Within groups	142.077	129	1.101		
	Total	144.593	134			
17. Difficulty copying notes from the chalkboard is a typical characteristic of a student with a learning disability.	Between groups	3.670	5	.734	.540	.746
	Within groups	175.412	129	1.360		
	Total	179.081	134			
18. Good ability to use phonics is a	Between groups	3.517	5	.703	.858	.512
	Within groups	105.816	129	.820		

		Sum of squares	*df*	Mean square	*F*	Sig.
typical characteristic of a student with a learning disability.	Total	109.333	134			
19. The severity of a student's learning disability fades with age.	Between groups	1.702	5	.340	.653	.660
	Within groups	67.232	129	.521		
	Total	68.933	134			
20. Atypical human growth is a characteristic of a student with a learning disability.	Between groups	5.372	5	1.074	1.226	.301
	Within groups	112.150	128	.876		
	Total	117.522	133			

As indicated in Table 6 it can be noted that only one variable achieved significance. Question 5, which asked participants if a LD can be expressed as a significant disability in social skills, had a significance number of $p < 0.022$. Specifically, the groups of teachers in the categories planning time/prep teacher, substitute/supply teacher, and other teachers were more likely to *agree/strongly agree* compared to the teachers who were teaching their own classroom grade or a special education/resource teacher. This suggests that teachers who are teaching a specific grade or special education are more likely to state that social skills problem are not characteristic of LD, while other groups of teachers are more likely to state that it is a classification. However, it is interesting to note that teachers who spend more time with the students with LD (grade teachers) don't see them as having social skills issues, whereas the teachers who spend less time, and perhaps on an infrequent basis (supply teachers), see students with LD as having social skills problems. Overall, the result of the ANOVA analysis implies that teaching position does not influence teachers' level of knowledge of LD characteristics, as only one out of the 20 questions on LD characteristics showed that there was a significant difference between what grade teachers are teaching and their knowledge on LD characteristics.

Table 6

Analysis of Variance for the Teaching Position and Teachers' Knowledge of LD Characteristics

		Sum of squares	*df*	Mean square	*F*	Sig.
1. A learning disability can be expressed as a significant disability in reading.	Between groups	2.949	8	.369	.676	.712
	Within groups	72.001	132	.545		
	Total	74.950	140			
2. A learning disability can be expressed as a significant disability in communication.	Between groups	6.392	8	.799	1.149	.335
	Within groups	93.216	134	.696		
	Total	99.608	142			
3. A learning disability can be expressed as a significant disability in written language.	Between groups	2.266	8	.283	.658	.727
	Within groups	57.206	133	.430		
	Total	59.472	141			
4. A learning disability can be expressed as a significant disability in mathematics.	Between groups	8.451	8	1.056	1.640	.119
	Within groups	85.669	133	.644		
	Total	94.120	141			
5. A learning disability can be expressed as a significant disability in social skills.	Between groups	23.439	8	2.930	2.330	.022*
	Within groups	168.477	134	1.257		
	Total	191.916	142			
6. A learning disability can be expressed as a significant disability in oral language.	Between groups	3.809	8	.476	.642	.741
	Within groups	99.394	134	.742		
	Total	103.203	142			
7. A person with a learning disability can also be identified with another disability.	Between groups	3.454	8	.432	1.285	.256
	Within groups	45.008	134	.336		
	Total	48.462	142			
8. A person with a learning disability can also be identified as gifted.	Between groups	5.794	8	.724	1.132	.346
	Within groups	85.744	134	.640		
	Total	91.538	142			
9. Fidgeting is a typical characteristic of a student with a learning disability.	Between groups	7.843	8	.980	.724	.670
	Within groups	181.402	134	1.354		
	Total	189.245	142			
10. Shouting out is a typical characteristic of a student with a learning disability.	Between groups	7.728	8	.966	.864	.548
	Within groups	148.638	133	1.118		
	Total	156.366	141			
11. Hitting is a typical characteristic	Between groups	5.530	8	.691	.829	.579
	Within groups	111.770	134	.834		

		Sum of squares	*df*	Mean square	*F*	Sig.
of a student with a learning disability.	Total	117.301	142			
12. Slower processing speed is a typical characteristic of a student with a learning disability.	Between groups	5.881	8	.735	.620	.760
	Within groups	158.959	134	1.186		
	Total	164.839	142			
13. Difficulty comprehending written materials is a typical characteristic of a student with a learning disability.	Between groups	4.260	8	.533	.521	.839
	Within groups	137.041	134	1.023		
	Total	141.301	142			
14. Difficulty with sentence structure is a typical characteristic of a student with a learning disability.	Between groups	10.262	8	1.283	1.039	.410
	Within groups	165.472	134	1.235		
	Total	175.734	142			
15. Excellent spelling is a typical characteristic of a student with a learning disability.	Between groups	5.213	8	.652	.933	.492
	Within groups	93.612	134	.699		
	Total	98.825	142			
16. Good ability to express ideas is a typical characteristic of a student with a learning disability.	Between groups	9.363	8	1.170	1.110	.360
	Within groups	141.294	134	1.054		
	Total	150.657	142			
17. Difficulty copying notes from the chalkboard is a typical characteristic of a student with a learning disability.	Between groups	9.424	8	1.178	.866	.547
	Within groups	182.241	134	1.360		
	Total	191.664	142			
18. Good ability to use phonics is a typical characteristic of a student with a learning disability.	Between groups	7.238	8	.905	1.167	.324
	Within groups	103.881	134	.775		
	Total	111.119	142			
19. The severity of a student's learning disability fades with age.	Between groups	4.686	8	.586	1.194	.307
	Within groups	65.747	134	.491		
	Total	70.434	142			
20. Atypical human growth is a characteristic of a student with a learning disability.	Between groups	2.814	8	.352	.394	.922
	Within groups	118.736	133	.893		
	Total	121.549	141			

* sig.<0.05 indicating that a significant relationship is present.
** sig.<0.01 indicating that a very strong significant relationship is present.

Table 7 displays the results for the chi-square test conducted to determine if participants relationship with close family member who has a LD influences their knowledge of the characteristics of LD. Only one question, question 5, asking participants if a LD can be expressed as a significant disability in social skills was significant, $\chi^2(2, N = 143) = 0.020, p = 0.05$. These findings suggest that primary school teachers who do have a family member with a LD are more likely to believe that a LD can be expressed as a significant disability in social skills compared to teachers who do not have a family member with a LD. The reason why the participants who have a close family member with a LD were more likely to believe that a LD can be expressed as a significant disability in social skills could be because they might have witnessed situations in which having a LD has affected an individual's social skills.

Overall, there was no significant relationship in the level of knowledge participants had on LD characteristics between participants who had a family member with a LD and those participants who did not have a family member with a LD. As a result the level of knowledge primary teachers' have on the characteristics of LD is not dependent on whether or not a teacher has a family member with a LD.

Table 7

Chi-Square Close Family Member With a LD and Teachers' Level of Knowledge on Characteristics of LD.

	YFM (n = 73)			NFM (n = 70)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
1. A learning disability can be expressed as a significant disability in reading.	4	68	0	1	66	2	.152
2. A learning disability can be expressed as a significant disability in communication.	3	70	0	5	65	0	.430

	YFM (n = 73)			NFM (n = 70)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
3. A learning disability can be expressed as a significant disability in written language.	3	70	0	0	69	0	.089
4. A learning disability can be expressed as a significant disability in mathematics.	7	66	0	2	67	0	.102
5. A learning disability can be expressed as a significant disability in social skills.	9	62	2	22	47	1	.020*
6. A learning disability can be expressed as a significant disability in oral language.	5	68	0	6	64	0	.699
7. A person with a learning disability can also be identified with another disability.	2	71	0	0	70	0	.163
8. A person with a learning disability can also be identified as gifted.	2	70	1	4	66	0	.423
9. Fidgeting is a typical characteristic of a student with a learning disability.	41	28	4	43	23	4	.789
10. Shouting out is a typical characteristic of a student with a learning disability.	55	13	4	52	14	4	.955
11. Hitting is a typical characteristic of a student with a learning disability.	60	8	5	62	5	3	.402
12. Slower processing speed is a typical characteristic of a student with a learning disability.	18	55	0	11	59	0	.184
13. Difficulty comprehending written materials is a typical characteristic of a student with a learning disability.	13	60	0	9	61	0	.412
14. Difficulty with sentence structure is a typical characteristic of a student with a learning disability.	21	50	2	19	51	0	.359
15. Excellent spelling is a typical characteristic of a student with a learning disability.	63	8	2	61	4	5	.274
16. Good ability to express ideas is a typical characteristic of a student with a learning disability.	54	16	3	52	15	3	.996

	YFM (n = 73)			NFM (n = 70)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
17. Difficulty copying notes from the chalkboard is a typical characteristic of a student with a learning disability.	22	50	1	18	51	1	.841
18. Good ability to use phonics is a typical characteristic of a student with a learning disability.	58	11	4	56	8	6	.655
19. The severity of a student's learning disability fades with age.	68	2	3	64	2	4	.904
20. Atypical human growth is a characteristic of a student with a learning disability.	55	7	11	50	4	15	.458

Note. YMF = Participant has a family member with LD, NFM = Participant does not have a family member with a LD.
*p <0.05 indicating that a significant relationship is present.

Table 8 presents the results of chi-square tests examining the relationship between teachers' level of knowledge on LD characteristics and whether they have a close friend with a LD. As indicated in Table 8, none of the questions produce a chi-square value of less than 0.05. Therefore, there is no relationship between primary teachers having a close friend with a LD and their level of knowledge on typical characteristics of LD.

Table 8

Chi-Square Test Close Friend with a LD and Teachers' Knowledge of LD Characteristics

	YCF (n = 84)			NCF (n = 59)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
1. A learning disability can be expressed as a significant disability in reading.	3	80	0	2	54	2	.234
2. A learning disability can be expressed as a significant disability in communication.	3	81	0	5	54	0	.209

	YCF (n = 84)			NCF (n = 59)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
3. A learning disability can be expressed as a significant disability in written language.	2	81	0	1	58	0	.770
4. A learning disability can be expressed as a significant disability in mathematics.	7	77	0	2	56	0	.240
5. A learning disability can be expressed as a significant disability in social skills.	16	68	0	15	41	3	.063
6. A learning disability can be expressed as a significant disability in oral language.	6	78	0	5	45	0	.769
7. A person with a learning disability can also be identified with another disability.	1	83	0	1	58	0	.800
8. A person with a learning disability can also be identified as gifted.	2	81	1	4	55	0	.311
9. Fidgeting is a typical characteristic of a student with a learning disability.	49	30	5	35	21	3	.974
10. Shouting out is a typical characteristic of a student with a learning disability.	63	18	2	44	9	6	.108
11. Hitting is a typical characteristic of a student with a learning disability.	71	8	5	51	5	3	.724
12. Slower processing speed is a typical characteristic of a student with a learning disability.	16	68	0	13	46	0	.662
13. Difficulty comprehending written materials is a typical characteristic of a student with a learning disability.	10	74	0	12	47	0	.169
14. Difficulty with sentence structure is a typical characteristic of a student with a learning disability.	23	60	1	17	41	1	.948
15. Excellent spelling is a typical characteristic of a student with a learning disability.	70	10	4	54	2	3	.195

	YCF (n = 84)			NCF (n = 59)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
16. Good ability to express ideas is a typical characteristic of a student with a learning disability.	60	20	4	46	11	2	.676
17. Difficulty copying notes from the chalkboard is a typical characteristic of a student with a learning disability.	24	59	1	16	42	1	.954
18. Good ability to use phonics is a typical characteristic of a student with a learning disability.	69	11	4	45	8	6	.448
19. The severity of a student's learning disability fades with age.	77	3	4	55	1	3	.797
20. Atypical human growth is a characteristic of a student with a learning disability.	64	6	14	41	5	12	.797

Note. YCF = Participant has a close friend with LD, NCF = Participant does not have a close friend with a LD.

Table 9 depicts the results of a chi-square test conducted to determine if a relationship existed between participants who had attended a workshop on LD and primary teachers' knowledge of characteristics of LD. Question 4, which asked whether a learning disability can be expressed as a significant disability in mathematics, was significant, $\chi^2(2, n = 129) = 0.029, p = 0.05$. This suggests that teachers who did not attend workshops were aware that a student could have a LD in math. This finding is interesting, as one would assume that teachers who had attended LD workshops might have been more knowledgeable about this than those who did not attend a LD workshop. However, this could be because the LD workshop mainly focused on LD in language rather than mathematics.

Furthermore, question 9, which asked participants if fidgeting was a typical characteristic a student with a LD, was also significant, $\chi^2(2, n = 129) =$

0.04, $p = 0.05$. This suggests that teachers who attended a workshop on LD are more likely to successfully know that fidgeting is not a typical characteristic of students with LD.

For the remaining questions the chi-square test value was greater than 0.05, thereby indicating that no significant correlation existed between teachers' who attended workshops on LD and their level of knowledge on LD characteristics.

Table 9

Chi-Square Test Participants Attended LD Workshop and Teachers' Knowledge on Characteristics of LD

	AW (n = 79)			NW (n = 50)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
1. A learning disability can be expressed as a significant disability in reading.	4	72	1	0	50	0	.185
2. A learning disability can be expressed as a significant disability in communication.	4	75	0	2	48	0	.780
3. A learning disability can be expressed as a significant disability in written language.	3	75	0	0	50	0	.161
4. A learning disability can be expressed as a significant disability in mathematics.	7	71	0	0	50	0	.029*
5. A learning disability can be expressed as a significant disability in social skills.	12	66	1	15	33	2	.066
6. A learning disability can be expressed as a significant disability in oral language.	4	75	0	5	45	0	.284
7. A person with a learning disability can also be identified with another disability.	2	77	0	0	50	0	.257
8. A person with a learning disability can also be identified as gifted.	4	75	0	1	49	0	.380

	AW (n = 79)			NW (n = 50)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
9. Fidgeting is a typical characteristic of a student with a learning disability.	41	34	4	37	11	2	.040*
10. Shouting out is a typical characteristic of a student with a learning disability.	60	16	3	37	8	4	.521
11. Hitting is a typical characteristic of a student with a learning disability.	70	8	1	41	5	4	.238
12. Slower processing speed is a typical characteristic of a student with a learning disability.	19	60	0	8	42	0	.273
13. Difficulty comprehending written materials is a typical characteristic of a student with a learning disability.	16	63	0	6	44	0	.225
14. Difficulty with sentence structure is a typical characteristic of a student with a learning disability.	26	52	1	11	38	1	.400
15. Excellent spelling is a typical characteristic of a student with a learning disability.	67	9	3	44	3	3	.519
16. Good ability to express ideas is a typical characteristic of a student with a learning disability.	63	12	4	32	16	2	.078
17. Difficulty copying notes from the chalkboard is a typical characteristic of a student with a learning disability.	22	55	2	14	36	0	.524
18. Good ability to use phonics is a typical characteristic of a student with a learning disability.	63	11	5	39	6	5	.730
19. The severity of a student's learning disability fades with age.	71	4	4	48	0	2	.255
20. Atypical human growth is a characteristic of a student with a learning disability.	60	8	11	36	2	11	.257

Note. AW = Participant had attended at least one workshop on LD, NW = Participant has not attended a workshop on LD.
* p <0.05 indicating that a significant relationship is present.

In conclusion, the participants did have a well-established knowledge of the typical characteristics of a LD. The participants were very confident in their knowledge of the types of LD (questions 1 to 5). Furthermore, when examining the cross-tab analysis there was no significant evidence that teachers' level of knowledge on the characteristics of LD was a result of any of the factors examined. Oveall, teacher's years of experience, teaching position, family member with a LD, close friend with a LD, and attending a workshop on LD had no significant influence on teachers' knowledge of the characteristics of LD.

Potential Risk Factors

When examining teacher knowledge of LD it was important to examine teachers' knowledge of the potential risk factors that may cause an individual to develop a LD. If primary teachers have a significant level of knowledge on potential risk factors that may cause someone to have a LD, they would be able to use this information to screen for potential students with LD in their class and therefore be able to identify these students early in their education. Table 10 depicts participants' knowledge of the different risk factors that may cause a student to develop a LD (See Table 10.1 in Appendix D for the frequency chart of participants' responses to questions on risk factors of LD). Questions 21 to 36 examined the participants' knowledge about the potential LD risk factors. In 13 of the 16 questions asked more than 50% of the participants indicated that they were aware of LD risk factors. Additionally, there was a high number of participants who responded *don't know* to the questions in this section, with *don't know* responses in this section ranging from 4% to 39.4% of participants' responses (See Table 10.1 in Appendix D). Specifically for three of the questions (question 26 asking participants if

lead poisoning increases the risk of LD; question 28 asking participants if an infection in the central nervous system increases the risk of LD; and question 29 asking participants if cancer treatment increases the risk of having LD) the mode for these three questions was the response *don't know*. These results suggest that participants are familiar and do have a basic understanding about possible risk factors that cause LD. However, their confidence in their understanding of the potential risk factors is not evident. Instead, it demonstrated that there is more room for teachers to gain knowledge and confidence in their knowledge about the risk factors that could result in a student having a LD.

Question 22 asked participants if poor nutrition increases the risk of an individual having a LD. While 35% of the participants where aware that poor nutrition does increase the risk of a person developing a LD, 54.3% of participants were not aware of this information (See Table 10.1 in Appendix D). As previously stated in the literature review, a contributing factor to LD is poor nutrition (Learning Disabilities Association of Ontario, 2014).

Table 10

Statistical Analysis of Participant's Responses to Potential Risk Factors That Can Cause LD

Variable	Mean	Median	Mode
21. A family history of a learning disability increases the risk of having a learning disability.	3.96 *Agree*	4.00 *Agree*	4 *Agree*
22. Poor nutrition increases the risk of having a learning disability.	2.79 *Disagree*	2.00 *Disagree*	2 *Disagree*
23. A history of head injury increases the risk of having a learning disability.	3.65 *Agree*	4.00 *Agree*	4 *Agree*
24. Child abuse increases the risk of having a learning disability.	3.18 *Don't know*	3.00 *Don't know*	4 *Agree*
25. Complications during pregnancy increase the risk of having a learning disability.	3.76 *Agree*	4.00 *Agree*	4 *Agree*
26. Lead poisoning increases the risk of having a learning disability.	3.48 *Don't know*	3.50 *Half way between don't know and agree*	3 *Don't know*

Variable	Mean	Median	Mode
27. Lack of parental support increases the risk of a learning disability.	2.42 *Disagree*	2.00 *Disagree*	2 *Disagree*
28. Infection in the central nervous system increases the risk of having a learning disability.	3.44 *Don't know*	3.00 *Don't know*	3 *Don't know*
29. Cancer treatment increases the risk of having a learning disability.	2.82 *Don't know*	3.00 *Don't know*	3 *Don't know*
30. Poor parenting style increases the risk of having a learning disability.	2.27 *Disagree*	2.00 *Disagree*	2 *Disagree*
31. Low child activity level increases the risk of having a learning disability.	2.49 *Disagree*	2.00 *Disagree*	2 *Disagree*
32. Cultural practices increase the risk of having a learning disability.	1.98 *Disagree*	2.00 *Disagree*	2 *Disagree*
33. Poor living environment increases the risk of having a learning disability.	2.61 *Don't know*	2.00 *Disagree*	2 *Disagree*
34. Taking medication increases the risk of having a learning disability.	2.44 *Disagree*	2.00 *Disagree*	2 *Disagree*
35. Genetic factors increase the risk of having a learning disability.	3.99 *Agree*	4.00 *Agree*	4 *Agree*
36. Neurological factors increase the risk of having a learning disability.	3.97 *Agree*	4.00 *Agree*	4 *Agree*

Question 24 in this section asked participants if child abuse increases the risk of an individual having a LD. Tables 10 depicted participants' limited knowledge on the relationship between child abuse and LD, with all three forms of analysis (mean, median and mode) indicating that participants did not know if child abuse was a risk factor. Specifically, 36.6% of participants stated that child abuse does not increase the risk of LD, while 48.6% of participants stated that child abuse does increase the risk of LD (See Table 10.1 in Appendix D). Child abuse does increase the risk of LD, especially if damage is done to the brain (National Center for Learning Disabilities, 2014). As previously stated in the literature review, there is still debate over brain injuries and their relationship to LD.

As shown in Table 10.1 in Appendix D, approximately 50% of participants knew that an infection in a person's central nervous system increased the risk of an individual developing a LD (question 28). However, there was a large number (39.4%) of

participants who did not know that infection in a person's central nervous system can cause a LD.

Similarly, in Table 10 all three analyses (mean, median, and mode) outcomes were *don't know* from the participants' responses. This raised the question, do primary school teachers realize that a LD is formed in the brain and can be a result of an infection to the central nervous system (that affects the brain) and could possibly affect an individual's learning? The participants' results indicate that primary school teachers are unsure on the relationship between the central nervous system and LD.

When asked whether cancer treatment (question 29) could cause an individual to develop a LD, a minority (37.8%) of respondents acknowledged that they did not know if it was a risk factor. Furthermore, only 23.8% of participants were aware that cancer treatment is a risk factor that can cause a LD. Since cancer and infection in the central nervous system are not risk factors that teachers come in contact with on a daily basis, their ability to observe these factors causing a student to have a LD is not as frequent compared to other risk factors such as genetic factors or family history that are more commonly seen in the classroom. Therefore, teachers require additional education in this area.

There were 13 participants who provided additional comments about the risk factors portion of the survey. Ten out of the 13 participants who left comments stated that they did not believe that some of the factors mentioned, such as poor living environment, could cause a LD. However, these factors can hinder academic achievement in a student with a LD. These statements provided by the participants are true; factors that affect an individual's environment in which they live are not a risk factor that can cause an

individual to develop a LD. However, these environmental factors can hinder an individual's ability to succeed academically (Lyon et al., 2001). For example, lack of parental support does not cause an individual to have a LD. However, lack of parental support can affect the degree of an individual's disability and also contribute to the success of a child's education. Desforges and Abouchaar (2003) noted the importance that parental support plays in a child's education. They found that students who have poor parental support may develop poor attitudes toward school and therefore not put effort into their schoolwork. As a result, environmental factors can hinder a student's with LD academic progress, but it is not a risk factor that can cause an individual to develop a LD.

Table 11 examined the results of an ANOVA test that was conducted on teachers' years of experience and their level of knowledge on possible risk factors that may result in a student developing a LD. The findings indicated that there is no significant relationship between teachers' years of experience and their level of knowledge of the possible risk factors that may cause a student to have a LD.

Table 11

Analysis of Variance of Teachers' Years of Experience and their Level of Knowledge on LD Risk Factors

		Sum of squares	*df*	Mean square	*F*	Sig.
21. A family history of learning disability increases the risk of having a learning disability.	Between groups	1.562	5	.312	.479	.791
	Within groups	83.431	128	.652		
	Total	84.993	133			
22. Poor nutrition increases the risk of having a learning disability.	Between groups	8.801	5	1.760	1.400	.229
	Within groups	158.381	126	1.257		
	Total	167.182	131			
23. A history of head injury increases the	Between groups	3.698	5	.740	.773	.571
	Within groups	122.511	128	.957		

		Sum of squares	*df*	Mean square	*F*	Sig.
risk of having a learning disability.	Total	126.209	133			
24. Child abuse increases the risk of having a learning disability.	Between groups	11.552	5	2.310	1.878	.103
	Within groups	157.500	128	1.230		
	Total	169.052	133			
25. Complications during pregnancy increase the risk of having a learning disability.	Between groups	3.075	5	.615	.727	.604
	Within groups	108.298	128	.846		
	Total	111.373	133			
26. Lead poisoning increases the risk of having a learning disability.	Between groups	3.528	5	.706	.766	.576
	Within groups	117.852	128	.921		
	Total	121.381	133			
27. Lack of parental support increases the risk of a learning disability.	Between groups	6.204	5	1.241	1.009	.415
	Within groups	157.386	128	1.230		
	Total	163.590	133			
28. Infection in the central nervous system increases the risk of having a learning disability.	Between groups	3.159	5	.632	.861	.509
	Within groups	93.864	128	.733		
	Total	97.022	133			
29. Cancer treatment increases the risk of having a learning disability.	Between groups	1.668	5	.334	.349	.882
	Within groups	123.413	129	.957		
	Total	125.081	134			
30. Poor parenting style increases the risk of having a learning disability.	Between groups	6.023	5	1.205	1.009	.415
	Within groups	152.851	128	1.194		
	Total	158.873	133			
31. Low child activity level increases the risk of having a learning disability.	Between groups	4.527	5	.905	.905	.480
	Within groups	128.999	129	1.000		
	Total	133.526	134			
32. Cultural practices increase the risk of having a learning disability.	Between groups	5.960	5	1.192	1.793	.119
	Within groups	85.773	129	.665		
	Total	91.733	134			
33. Poor living environment increases the risk of having a learning disability.	Between groups	9.786	5	1.957	1.554	.178
	Within groups	161.236	128	1.260		
	Total	171.022	133			

Table 12 outlines the results of an ANOVA test conducted to determine if teaching position influenced their level of knowledge on LD risk factors. Only question 23, which asked participants if a history of head injury increased the risk of an individual having a LD, was significant, $p < 0.01$. Specifically, teachers who taught a split grade,

planning time/prep and substitute/supply teachers more strongly agreed to question 23 and indicated that head injuries do increase the risk of an individual having a LD (although there is still some debate on whether head injuries cause LD). Overall, there is no significant relationship among the different teaching positions and the level of knowledge on LD risk factors.

Table 12

Analysis of Variance for the Teaching Position and Teachers' Knowledge on LD Risk Factors

		Sum of squares	*df*	Mean square	*F*	Sig.
21. A family history of learning disability increases the risk of having a learning disability.	Between groups	7.792	8	.974	1.440	.186
	Within groups	89.955	133	.676		
	Total	97.746	141			
22. Poor nutrition increases the risk of having a learning disability.	Between groups	11.242	8	1.405	1.081	.381
	Within groups	170.329	131	1.300		
	Total	181.571	139			
23. A history of head injury increases the risk of having a learning disability.	Between groups	19.096	8	2.387	2.661	.010**
	Within groups	119.298	133	.897		
	Total	138.394	141			
24. Child abuse increases the risk of having a learning disability.	Between groups	7.219	8	.902	.684	.705
	Within groups	175.379	133	1.319		
	Total	182.599	141			
25. Complications during pregnancy increase the risk of having a learning disability.	Between groups	9.707	8	1.213	1.549	.146
	Within groups	104.152	133	.783		
	Total	113.859	141			
26. Lead poisoning increases the risk of having a learning disability.	Between groups	6.470	8	.809	.904	.515
	Within groups	118.967	133	.894		
	Total	125.437	141			
27. Lack of parental support increases the risk of a learning disability.	Between groups	8.493	8	1.062	.821	.585
	Within groups	171.993	133	1.293		
	Total	180.486	141			
28. Infection in the central nervous system increases the risk of having a learning disability.	Between groups	2.952	8	.369	.490	.861
	Within groups	100.097	133	.753		
	Total	103.049	141			
29. Cancer treatment increases the risk of having a learning disability.	Between groups	6.382	8	.798	.829	.578
	Within groups	128.890	134	.962		
	Total	135.273	142			
30. Poor parenting style increases the risk of having a learning disability.	Between groups	8.831	8	1.104	.887	.529
	Within groups	165.458	133	1.244		
	Total	174.289	141			
31. Low child activity level increases the risk of having a learning disability.	Between groups	7.920	8	.990	.935	.490
	Within groups	141.814	134	1.058		
	Total	149.734	142			
32. Cultural practices increase	Between groups	4.828	8	.603	.824	.583

		Sum of squares	*df*	Mean square	*F*	Sig.
the risk of having a learning disability.	Within groups	98.109	134	.732		
	Total	102.937	142			
33. Poor living environment increases the risk of having a learning disability.	Between groups	14.154	8	1.769	1.386	.208
	Within groups	169.761	133	1.276		
	Total	183.915	141			
34. Taking medication increases the risk of having a learning disability.	Between groups	6.099	8	.762	.821	.586
	Within groups	122.639	132	.929		
	Total	128.738	140			
35. Genetic factors increase the risk of having a learning disability.	Between groups	1.922	8	.240	.463	.880
	Within groups	69.071	133	.519		
	Total	70.993	141			
36. Neurological factors increase the risk of having a learning disability.	Between groups	2.758	8	.345	.624	.757
	Within groups	74.067	134	.553		
	Total	76.825	142			

* p <0.05 indicating that a significant relationship is present.
** p <0.01 indicating that a very strong significant relationship is present.

As depicted in Table 13 there were no significant differences between responses from participants who did have a family member with a LD compared to those who did not have a family member with a LD. Therefore, teachers' knowledge on LD risk factors is not affected by their connection to a family member with a LD.

Table 13

Chi Square Close Family Member With a LD and Teachers' Level of Knowledge on Risk Factors of LD.

	YFM (n = 73)			NFM (n = 70)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
21. A family history of learning disability increases the risk of having a learning disability.	3	65	4	11	56	3	.069
22. Poor nutrition increases the risk of having a learning disability.	37	27	7	39	22	8	.740
23. A history of head injury increases the risk of having a learning disability.	13	53	7	15	48	6	.837
24. Child abuse increases the risk of having a learning disability.	28	35	10	24	34	11	.879
25. Complications during pregnancy increase the risk of having a learning disability.	10	53	10	7	51	11	.778

	YFM (n = 73)			NFM (n = 70)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
26. Lead poisoning increases the risk of having a learning disability.	11	36	26	7	35	27	.667
27. Lack of parental support increases the risk of a learning disability.	53	14	6	46	20	3	.295
28. Infection in the central nervous system increases the risk of having a learning disability.	8	36	29	9	33	27	.929
29. Cancer treatment increases the risk of having a learning disability.	26	18	29	29	18	25	.773
30. Poor parenting style increases the risk of having a learning disability.	54	13	6	50	15	4	.747
31. Low child activity level increases the risk of having a learning disability.	48	11	14	42	20	8	.101
32. Cultural practices increase the risk of having a learning disability.	62	6	5	59	5	6	.908
33. Poor living environment increases the risk of having a learning disability.	47	21	5	39	21	9	.412
34. Taking medication increases the risk of having a learning disability.	45	11	17	41	13	14	.792
35. Genetic factors increase the risk of having a learning disability.	1	66	6	5	58	6	.456
36. Neurological factors increase the risk of having a learning disability.	3	64	6	2	60	8	.618

Note. YMF = Participant has a family member with LD, NFM = Participant does not have a family member with a LD.

Table 14 depicts the results of a chi-square test that examined if a correlation exists between primary teachers' having a close friend with a LD and their level of knowledge of the possible risk factors that can cause an individual to have a LD. Question 23, which asked participants if a history of head injury increased the risk of a student's having a LD, was significant, $\chi^2(2, n = 143) = 0.011, p = 0.05$. This suggests that if a primary school teacher has a close friend with a LD, they are more likely to

know that a history of head injury can increase the risk of a LD. Additionally, question 24 asked participants if child abuse increases the risk of a student having a LD, $\chi^2(2, n = 143) = 0.023$, $p = 0.05$. The results for this question shows that primary teachers who have a close friend with a LD are more likely to respond that child abuse does increase the risk factor of a student having a LD.

Table 14

Chi-Square Test Close Friend with a LD and Teachers' Knowledge on LD Risk Factors

	YCF (n = 84)			NCF (n = 59)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
21. A family history of learning disability increases the risk of having a learning disability.	6	75	3	8	46	4	.258
22. Poor nutrition increases the risk of having a learning disability.	44	31	8	32	18	7	.740
23. A history of head injury increases the risk of having a learning disability.	11	67	5	17	34	8	.011*
24. Child abuse increases the risk of having a learning disability.	28	48	8	24	21	13	.023*
25. Complications during pregnancy increase the risk of having a learning disability.	10	66	8	7	38	13	.098
26. Lead poisoning increases the risk of having a learning disability.	10	45	29	8	26	24	.591
27. Lack of parental support increases the risk of a learning disability.	60	19	5	39	15	4	.867
28. Infection in the central nervous system increases the risk of having a learning disability.	8	42	34	9	27	22	.557
29. Cancer treatment increases the risk of having a learning disability.	30	22	32	25	12	22	.636
30. Poor parenting style increases the risk of having a learning disability.	61	17	6	43	11	4	.979
31. Low child activity level increases the risk of having	50	19	15	30	12	7	.530

	YCF (n = 84)			NCF (n = 59)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
a learning disability.							
32. Cultural practices increase the risk of having a learning disability.	72	5	7	49	6	4	.625
33. Poor living environment increases the risk of having a learning disability.	49	27	8	37	15	6	.723
34. Taking medication increases the risk of having a learning disability.	52	16	15	34	8	16	.350
35. Genetic factors increase the risk of having a learning disability.	2	78	4	4	46	8	.031*
36. Neurological factors increase the risk of having a learning disability.	4	73	7	1	51	7	.735

Note. YCF = Participant has a close friend with LD, NCF = Participant does not have a close friend with a LD.
* p <0.05 indicating that a significant relationship is present.

Finally, question 35, asking participants if genetic factors increase the risk of a student having a LD, was also significant, $\chi^2(2, n = 143) = 0.031$, $p = 0.05$, indicating that a relationship exists between primary school teachers who have a close friend with a LD and knowing that genetic factors increase the risk of a having a LD.

The remaining questions did not produce any significant differences. As a result, for primary teachers who have close friends with LD, their knowledge of the relationship between head injuries, child abuse, and genetic factors and LD was different than the knowledge of primary teachers who did not have a close friend with a LD. However no other differences were found.

Table 15 displays the results of chi-square tests conducted on whether participants' workshop attendance affected their knowledge of the possible risk factors that may cause a person to have a LD. Only question 33, asking participants if poor parenting style increased the risk of a child developing a LD, was significant, $\chi^2(2, n =$

129) = 0.034, p = 0.05. This suggests that participants who attended a workshop on LD were more likely informed that poor parenting style does not increase the risk of a child having a LD. The remaining questions generated no significant correlations, suggesting that primary teachers' knowledge about the risk factors of LD was not affected by workshop attendance.

Table 15

Chi-Square Test Participants Attended LD Workshop and Teachers' Knowledge of LD Risk Factors

	AW (n = 79)			NW (n = 50)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
21. A family history of learning disability increases the risk of having a learning disability.	8	69	2	5	40	4	.339
22. Poor nutrition increases the risk of having a learning disability.	47	25	7	23	17	7	.419
23. A history of head injury increases the risk of having a learning disability.	15	59	5	12	30	7	.196
24. Child abuse increases the risk of having a learning disability.	32	37	10	16	23	10	.436
25. Complications during pregnancy increase the risk of having a learning disability.	12	55	12	3	39	7	.280
26. Lead poisoning increases the risk of having a learning disability.	10	40	29	7	26	16	.889
27. Lack of parental support increases the risk of a learning disability.	60	14	5	29	16	4	.120
28. Infection in the central nervous system increases the risk of having a learning disability.	11	39	29	6	24	19	.951
29. Cancer treatment increases the risk of having a learning disability.	34	19	26	15	13	22	.297
30. Poor parenting style increases the risk of having a learning disability.	64	10	5	30	15	4	.034*

	AW (n = 79)			NW (n = 50)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
31. Low child activity level increases the risk of having a learning disability.	48	17	14	31	12	7	.839
32. Cultural practices increase the risk of having a learning disability.	65	5	9	42	6	2	.209
33. Poor living environment increases the risk of having a learning disability.	50	20	8	28	16	6	.653
34. Taking medication increases the risk of having a learning disability.	53	12	14	26	8	14	.270
35. Genetic factors increase the risk of having a learning disability.	3	70	6	2	41	6	.668
36. Neurological factors increase the risk of having a learning disability.	2	69	8	2	43	5	.998

Note. AW = Participant had attended at least one workshop on LD, NW = Participant has not attended a workshop on LD.
* p <0.05 indicating that a significant relationship is present.

In conclusion, the majority of participants were aware of the potential LD risk factors. However the participants were relatively less aware of the potential risk factors than they were of the characteristics of LD (that were examined in question 1 to 20 of the survey). As a result, it appears that teachers do have a general understanding about risk factors that could result in an individual having a LD. Nonetheless, participants' level of confidence in this area and their understanding of potential risk factors were not strong. Additionally, in the ANOVA and chi-square analyses that were conducted, there was no significant support that any of the factors examined (years of teaching experience, teaching position, family member or close friend with LD, or attending a workshop) affected teachers' knowledge of potential LD risk factors. Overall, the results suggested that primary teachers need more knowledge about possible risk factors of LD to ensure they can help detect students with LD early in their education careers.

Teaching Strategies

When creating this survey it was important to develop a portion of the survey that examined teachers' knowledge of effective teaching strategies to assist students with LD with their education, as it will help determine if teachers have adequate knowledge on how to effectively teach students with LD in their classrooms. This section of the survey focused on examining teachers' knowledge of different effective teaching strategies for students with LD (Table 16 and Table 16.1 in Appendix D). For nine of the 11 questions asked in this section, pertained to whether the participants believed they were informed of the effective or ineffective teaching strategies for students with a LD.

Table 16

Statistical Analysis of Participants' Responses for Teaching Strategies for Students with a LD.

Variable	Mean	Median	Mode
37. You need to have an Individual Education Plan before providing modifications and accommodations to students with a learning disability.	2.55 *Don't know*	2.00 *Disagree*	2 *Disagree*
38. The students need to be formally identified with a learning disability before you can provide them with modifications and accommodations.	2.03 *Disagree*	2.00 *Disagree*	2 *Disagree*
39. Differentiated instruction is an effective classroom strategy to use for students with a learning disability.	4.51 *Strongly agree*	5.00 *Strongly agree*	5 *Strongly agree*
40. Direct instruction is an effective classroom strategy to use for students with a learning disability.	3.77 *Agree*	4.00 *Agree*	4 *Agree*
41. Providing more work is an effective classroom strategy to use for students with a learning disability.	1.55 *Disagree*	1.00 *Strongly disagree*	1 *Strongly disagree*
42. Breaking lessons down into smaller parts is an effective classroom strategy to use for students with a learning disability.	4.66 *Strongly agree*	5 *Strongly agree*	5 *Strongly agree*
43. Giving a student a computer is an effective classroom strategy to use for students with a learning disability.	3.95 *Agree*	4.00 *Agree*	4 *Agree*
44. Instructing students to work by themselves is an effective classroom strategy to use for students with a learning disability.	1.98 *Disagree*	2.00 *Disagree*	2 *Disagree*
45. An effective classroom strategy for students	2.93	3.00	4

Variable	Mean	Median	Mode
with a learning disability is to present information orally and not in writing.	*Don't know*	*Don't know*	*Agree*
46. Using graphic organizers is an effective classroom strategy to use for students with a learning disability.	4.23 *Agree*	4.00 *Agree*	4 *Agree*
47. Medication should be used to reduce the severity of a students' learning disability.	2.10 *Disagree*	1.00 *Disagree*	2 *Disagree*

Question 43 asked participants if giving a student a computer was an effective teaching strategy to use for students with LD. The acceptable response to this question was *disagree*, but, as indicated in Table, the mean, median, and mode of responses were all *agree*. This question had a considerably low percentage of participants (13.4%) who responded "disagree". I believe that this was because of the wording and misinterpretation of the question. It is widely known in schools that computers can be very beneficial and effective in assisting a student with LD succeed academically (Hasselbring & Williams Glaser, 2000). While there are many excellent software programs available for students with LD that have been proven to support the academic success of a student with LD, such as Kurzweil, Inspiration, Dragon, and so on (Floyd & Judge, 2012), just giving a student a computer is not an effective strategy to help the academic performance of a student with LD (Hasselbring & Williams Glaser, 2000). In order for a computer to be an effective tool, teachers and students must be trained on how to use the appropriate software (Hasselbring & Williams Glaser, 2000). Furthermore, Floyd and Judge (2012) determined in their research that designing the appropriate accommodations for a student's disability and for teachers to keep up to date with continual advancement in assistive technology is imperative for students' academic success.

Question 45 asked participants if presenting information orally, not written, to students with LD was an effective classroom strategy for these students. In Table 16 it

can be noted that the mean and median of the responses were *don't know*, while the mode was *agree*; 46.2% of participants stated it was not an effective classroom strategy for students with LD, 49% of participants stated it was an effective strategy. However, just providing information orally to a student with LD is not an effective strategy as all students learn differently. There are three ways in which people learn: auditory, kinesthetic, and visual (Learning Disabilities Association of Canada, 2015). Additionally, many people learn best by incorporating more than one of these methods such as auditory/visual or visual/kinesthetic. Presenting information orally only appeals to one learning style. All LD learning styles are not the same, and therefore presenting the information only orally will not benefit all LD learners. Furthermore, it is commonly assumed that when an individual has a LD they have difficulties with reading (Mayes & Calhoun, 2007); by presenting the information in writing it would not be an effective classroom strategy to assist a student with LD. As a result, teachers may believe that it is an effective strategy to orally present the information to the student, thereby resulting in a close margin between the two categories of responses.

Additional comments about teaching strategies were left by 44 participants. Of the 44 comments 18% of the comments indicated that a computer can really help students with a LD; however, only when it is used appropriately. As they have seen in education settings, computers are being used as "baby-sitters" in which educators have students with LD go on the computer and play a game because they are either distracting the class, or the teacher does not have time to assist the student. Additionally, 45.5% of the participants who commented mentioned that the effectiveness of a strategy used would depend on the student as each student with a LD is different and a strategy that works for

one student may not work for another student. Furthermore, 43.2% of participants commented that in the education system, an IEP is not needed for accommodations, but one is needed in order for modifications to be made to a student's learning. As one participant commented, "An IEP is not required for accommodations. If students' program needs to be modified to a different grade level an IEP must be in place (sic)" (participant, 2014). It is important to note that if this survey was used again, making questions 37 (asking participants if they need an IEP before they can provide modifications and accommodations to students) and 38 (asking participants if students need to be formally identified with a LD before a teacher can provide accommodations and modification to students) both into two questions, one asking about accommodations and one about modifications, would allow for a better analysis of teachers' comprehension of teaching students with and LD.

Table 17 presents the results of an ANOVA test that examined teachers' years of experience and their level of knowledge on effective teaching strategies for students with a LD. As a result of the ANOVA test conducted, there were no significant relationships between the responses to the questions on effective teachers' strategies and years of teaching experience.

Table 17

Analysis of Variance for Teachers' Years of Experience and Their Level of Knowledge on Effective Teaching Strategies for Students With a LD.

		Sum of squares	*df*	Mean square	*F*	Sig.
37. You need to have an Individual Education Plan before providing modifications and accommodations to students with a learning disability.	Between groups	4.150	5	.830	.467	.800
	Within groups	229.184	129	1.777		
	Total	233.333	134			

		Sum of squares	*df*	Mean square	*F*	Sig.
38. The students need to be formally identified with a learning disability before you can provide them with modifications and accommodations.	Between groups	6.910	5	1.382	1.158	.333
	Within groups	153.904	129	1.193		
	Total	160.815	134			
39. Differentiated instruction is an effective classroom strategy to use for students with a learning disability.	Between groups	1.470	5	.294	.554	.735
	Within groups	68.000	128	.531		
	Total	69.470	133			
40. Direct instruction is an effective classroom strategy to use for students with a learning disability.	Between groups	2.983	5	.597	.461	.804
	Within groups	166.751	129	1.293		
	Total	169.733	134			
41. Providing more work is an effective classroom strategy to use for students with a learning disability.	Between groups	.974	5	.195	.445	.817
	Within groups	56.551	129	.438		
	Total	57.526	134			
42. Breaking lessons down into smaller parts is an effective classroom strategy to use for students with a learning disability.	Between groups	.239	5	.048	.205	.960
	Within groups	30.087	129	.233		
	Total	30.326	134			
43. Giving a student a computer is an effective classroom strategy to use for students with a learning disability.	Between groups	1.528	5	.306	.328	.895
	Within groups	119.285	128	.932		
	Total	120.813	133			
44. Instructing students to work by themselves is an effective classroom strategy to use for students with a learning disability.	Between groups	4.658	5	.932	1.141	.342
	Within groups	105.313	129	.816		
	Total	109.970	134			
45. An effective classroom strategy for students with a learning disability is to present information orally and not in writing.	Between groups	4.652	5	.930	.583	.713
	Within groups	205.896	129	1.596		
	Total	210.548	134			
46. Using graphic organizers is an effective classroom strategy to use for students with a learning disability.	Between groups	4.116	5	.823	1.683	.143
	Within groups	62.608	128	.489		
	Total	66.724	133			
47. Medication should be used to reduce the severity of a students' learning disability.	Between groups	3.293	5	.659	.715	.613
	Within groups	118.811	129	.921		
	Total	122.104	134			

Table 18 depicts the results of an ANOVA test that examined whether the participants' teaching position influenced their knowledge of effective classroom teaching strategies for students with a LD. Except for question 39, there was no significant relationship between teaching position and knowledge of effective teaching strategies. Question 39 asked participants if differentiated instruction was an effective classroom strategy to use for students with a LD, $p < 0.032$. All of the different groups of teaching grades examined agreed that differentiated instruction was an effective strategy. However, teachers who taught a split grade (for example, taught a class of grade 1 / 2) strongly agreed with this statement and had more confidence with differentiated instruction being an effective strategy. This may be due to the fact that teachers who teach split classes on a daily basis generally have to differentiate their instruction because they are teaching two different curriculum grade levels in one classroom. Therefore in order to teach both grades effectively, they already had to differentiate instruction for their two grade levels. As a result, they see this as an effective classroom strategy when teaching multiple grades in one class; it might also then be an effective classroom strategy for teaching students with a LD who may be at a different learning level in some subjects being taught in the class. Overall, the ANOVA tests indicated that there was no significant relationship between teaching position and level of knowledge of effective classroom teaching strategies for students with LD.

Table 18

Analysis of Variance Test for the Teaching Position and Teachers' Knowledge of Effective Teaching Strategies for Students with LD

		Sum of squares	*df*	Mean square	*F*	Sig.
37. You need to have an Individual Education Plan before providing modifications and accommodations to students with a learning disability.	Between groups	15.772	8	1.972	1.182	.315
	Within groups	223.584	134	1.669		
	Total	239.357	142			
38. The students need to be formally identified with a learning disability before you can provide them with modifications and accommodations.	Between groups	12.738	8	1.592	1.430	.189
	Within groups	149.150	134	1.113		
	Total	161.888	142			
39. Differentiated instruction is an effective classroom strategy to use for students with a learning disability.	Between groups	8.333	8	1.042	2.194	.032*
	Within groups	63.139	133	.475		
	Total	71.472	141			
40. Direct instruction is an effective classroom strategy to use for students with a learning disability.	Between groups	6.736	8	.842	.605	.773
	Within groups	186.648	134	1.393		
	Total	193.385	142			
41. Providing more work is an effective classroom strategy to use for students with a learning disability.	Between groups	2.600	8	.325	.766	.633
	Within groups	56.855	134	.424		
	Total	59.455	142			
42. Breaking lessons down into smaller parts is an effective classroom strategy to use for students with a learning disability.	Between groups	1.758	8	.220	.967	.464
	Within groups	30.451	134	.227		
	Total	32.210	142			
43. Giving a student a computer is an effective classroom strategy to use for students with a learning disability.	Between groups	11.228	8	1.404	1.646	.118
	Within groups	113.427	133	.853		
	Total	124.655	141			
44. Instructing students to work by themselves is an effective classroom strategy to use for students with a learning disability.	Between groups	3.883	8	.485	.607	.770
	Within groups	107.055	134	.799		
	Total	110.937	142			
45. An effective classroom strategy for students with a learning disability is to present information orally and not in writing.	Between groups	2.991	8	.374	.232	.984
	Within groups	216.310	134	1.614		
	Total	219.301	142			
46. Using graphic organizers is an effective	Between groups	1.907	8	.238	.474	.873

		Sum of squares	*df*	Mean square	*F*	Sig.
classroom strategy to use for students with a learning disability.	Within groups	66.881	133	.503		
	Total	68.789	141			
47. Medication should be used to reduce the severity of a students' learning disability.	Between groups	4.299	8	.537	.570	.801
	Within groups	126.330	134	.943		
	Total	130.629	142			

* p <0.05 indicating that a significant relationship is present.

Table 19 displays the results of a chi-square analysis that was conducted on the effect of participants having a family member with a LD and participants' knowledge about effective teaching strategies for students with a LD. There was no significant difference between the two groups (participants with a family member with a LD and participants who did not have a family member with a LD) and their knowledge of effective teaching strategies, except for question 41. Question 41, which asked participants if providing more work is an effective classroom strategy for LD, was significant, $\chi^2(2, n = 143) = 0.047, p = 0.05$. Specifically, participants who did not have a family member with a LD were more likely to be aware that providing more work is not an effective teaching strategy compared to participants who did have a family member with a LD.

It should be noted that for question 42, which asked participants if breaking lessons down into smaller parts was an effective classroom strategy for teaching students with a LD, both groups (participants with a family member with a LD and participants who did not have a family member with a LD) were aware that breaking lessons down into smaller parts was an effective teaching strategy for students with LD. Therefore there is no difference between the two groups' responses. In conclusion, aside from the provision of more work, there was no significant difference between the teachers' level of knowledge of effective teaching strategies and whether or not the primary teachers had a

family member with a LD.

Table 19

Chi-Square Test Close Family Member with a LD and Teachers' Knowledge on Effective Teaching Strategies for Teaching Students with LD

	YFM (n = 73)			NFM (n = 70)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
37. You need to have an Individual Education Plan before providing modifications and accommodations to students with a learning	48	24	1	48	22	0	.599
38. The students need to be formally identified with a learning disability before you can provide them with modifications and accommodations.	57	15	1	61	8	1	.332
39. Differentiated instruction is an effective classroom strategy to use for students with a learning disability.	1	72	0	5	64	0	.082
40. Direct instruction is an effective classroom strategy to use for students with a learning disability.	16	53	4	15	53	2	.728
41. Providing more work is an effective classroom strategy to use for students with a learning disability.	70	3	0	70	0	0	.047*
42. Breaking lessons down into smaller parts is an effective classroom strategy to use for students with a learning disability.	0	73	0	0	70	0	a
43. Giving a student a computer is an effective classroom strategy to use for students with a learning disability.	9	63	1	10	57	2	.751
44. Instructing students to work by themselves is an effective classroom strategy to use for students with a learning disability.	65	6	2	59	7	4	.615
45. An effective classroom strategy for students with a learning disability is to	39	32	2	27	38	5	.108

	YFM (n = 73)			NFM (n = 70)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
present information orally and not in writing.							
46. Using graphic organizers is an effective classroom strategy to use for students with a learning disability.	2	71	0	2	66	1	.332
47. Medication should be used to reduce the severity of a students' learning disability.	58	7	8	48	8	14	.226

Note. YMF = Participant has a family member with LD, NFM = Participant does not have a family member with a LD.

* p <0.05 indicating that a significant relationship is present.

a. No statistics are computed because 42, breaking lessons down into smaller parts is an effective classroom strategy to use for students with a learning disability, is a constant

Table 20 displays the chi-square results examining the correlation between primary school teachers with a close friend with a LD and their level of knowledge about effective teacher strategies for students with LD with LD. None of the 11 questions asked in this section established a significant chi-square value. Question 42, asking participants if breaking lessons down into smaller parts is an effective classroom strategy, was unable to create a chi-square test value as both portions of the test responded with 100% *strongly agree/agree*, therefore both groups of participants examined were aware that breaking lessons down into smaller sections was an effective teaching strategy for students with LD.

Table 20

Chi-Square Test Close Friend with a LD and Teachers' Knowledge on Effective Teaching Strategies for Teaching Students with a LD

	YCF(n = 84)			NCF (n = 59)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
37. You need to have an Individual Education Plan before providing modifications and accommodations to students with a learning	60	24	0	36	22	1	.246
38. The students need to be formally identified with a learning disability before you can provide them with modifications and accommodations.	72	12	0	38	11	2	.173
39. Differentiated instruction is an effective classroom strategy to use for students with a learning disability.	4	80	0	2	56	0	.702
40. Direct instruction is an effective classroom strategy to use for students with a learning disability.	19	61	4	12	45	2	.860
41. Providing more work is an effective classroom strategy to use for students with a learning disability.	81	3	0	59	0	0	.089
42. Breaking lessons down into smaller parts is an effective classroom strategy to use for students with a learning disability.	0	84	0	0	59	0	a
43. Giving a student a computer is an effective classroom strategy to use for students with a learning disability.	12	70	2	7	50	1	.892
44. Instructing students to work by themselves is an effective classroom strategy to use for students with a learning disability.	74	7	3	50	6	3	.834
45. An effective classroom strategy for students with a learning disability is to present information orally and not in writing.	40	41	3	26	29	4	.634

	YCF(n = 84)			NCF (n = 59)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
46. Using graphic organizers is an effective classroom strategy to use for students with a learning disability.	4	79	1	0	58	0	.235
47. Medication should be used to reduce the severity of a students' learning disability.	65	8	11	41	7	11	.442

Note. YCF = Participant has a close friend with LD, NCF = Participant does not have a close friend with a LD.

a. No statistics are computed because 42, breaking lessons down into smaller parts is an effective classroom strategy to use for students with a learning disability, is a constant.

As indicated in Table 21, no significant correlation was found between teachers' workshop attendance and their knowledge of effective classroom teaching strategies for students with LD. Workshops are a common method for professional development to be provided to teachers. Yet, it seems that these workshops on LD have not provided them with a significant amount of more information. A recommendation for future research would be that the nature of workshops on LD should be investigated to find more suitable content or strategies so that teachers gain the needed knowledge from them.

Table 21

Chi-Square Test Participants Attended LD Workshop and Teachers' Knowledge of Effective Teaching Strategies for Students with LD

	AW(n = 79)			NW (n = 50)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
37. You need to have an Individual Education Plan before providing modifications and accommodations to students with a learning	52	27	0	32	17	1	.450
38. The students need to be formally identified with a learning disability before you can provide them with	66	10	0	39	9	2	.190

	AW(n = 79)			NW (n = 50)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
modifications and accommodations.							
39. Differentiated instruction is an effective classroom strategy to use for students with a learning disability.	2	77	0	2	47	0	.624
40. Direct instruction is an effective classroom strategy to use for students with a learning disability.	19	57	3	8	40	2	.548
41. Providing more work is an effective classroom strategy to use for students with a learning disability.	78	1	0	48	2	0	.315
42. Breaking lessons down into smaller parts is an effective classroom strategy to use for students with a learning disability.	0	79	0	0	50	0	a
43. Giving a student a computer is an effective classroom strategy to use for students with a learning disability.	11	64	3	4	46	0	.198
44. Instructing students to work by themselves is an effective classroom strategy to use for students with a learning disability.	68	8	3	44	3	3	.624
45. An effective classroom strategy for students with a learning disability is to present information orally and not in writing.	39	34	6	20	29	1	.153
46. Using graphic organizers is an effective classroom strategy to use for students with a learning disability.	1	77	1	2	47	0	.441
47. Medication should be used to reduce the severity of a students' learning disability.	60	9	10	38	4	8	.851

Note. AW = Participant had attended at least one workshop on LD, NW = Participant has not attended a workshop on LD.

a. No statistics are computed because 42, breaking lessons down into smaller parts is an effective classroom strategy to use for students with a learning disability, is a constant.

Of all the types of knowledge examined by the survey, the majority of participants were most knowledgeable about effective classroom strategies, with 85% of the participants answering 6 of the 11 questions. As a result, primary teachers appear to have a more than adequate level of knowledge about teaching strategies. However, it is important for teachers to stay current on this information as new, more effective strategies are always being introduced into the education setting. Additionally, the ANOVA and chi-square analysis also determined that there was no significant evidence that determined that one of the factors examined (years of teaching experience, teaching position, family member with LD, close friend with LD, and attending a workshop in LD) affected a primary teachers' knowledge on effective teaching strategies for students with LD.

Confidence Teaching Students With Learning Disabilities

One of the final sections in the survey examined teachers' confidence and comfort in their ability to teach students with LD. This section was important to include in the survey, as teachers' opinions on their ability to teach students with LD would affect their ability to identify and accommodate these students in the classroom. Table 22 depicts the mean, median, and mode of the results from the section of the survey that asked teachers about their comfort in teaching students with LD (See Table 22.1 in Appendix D for the frequency of participants' responses to the questions in this section). Questions 48 to 54 examined how comfortable teachers were with teaching a student with a LD. Of the participants, 76.2% felt they understood LD, and 63% of participants felt they were informed enough to teach students with a LD. Furthermore, 68.5% of participants felt they were prepared enough, meaning participants felt they had enough knowledge and

resources to teach students with LD; 83.2% of participants felt comfortable enough to teach students with a LD. While the participants indicated that they had the knowledge and comfort levels to teach students with LD effectively, both the mode and median of responses in questions 51 demonstrated that teachers feel as though they do not have adequate resources to teach students with LD. This can also be noted in Table 22.1, where 57.4% of participants did not believe they had adequate resources to teach students with a LD and therefore believed they needed more information on LD to help teach these students. Twenty-two participants contributed additional comments to this section of the survey. Many participants noted that there is always more to learn, especially in the field of special education. Furthermore, one participant commented that early on in her career she did not feel comfortable teaching special education or students with LD; however because of participating in an AQ course and many professional development programs her board has offered, she feels more prepared now than before, although, she did note, like so many other participants, that there is constantly new information to learn about LD.

Table 22

Statistical Analysis of Participant Response Teaching Students With LD

Variable	Mean	Median	Mode
48. I understand learning disabilities enough to teach students with this identification.	3.75 *Agree*	4.00 *Agree*	4 *Agree*
49. I feel well informed about teaching students with a learning disability.	3.42 *Don't Know*	4.00 *Agree*	4 *Agree*
50. I feel prepared to teach students with learning disabilities.	3.55 *Agree*	4.00 *Agree*	4 *Agree*
51. I have adequate resources to teach students with learning disabilities.	2.86 *Don't know*	2.00 *Disagree*	2 *Disagree*
52. I feel comfortable teaching students identified with a learning disability.	3.86 *Agree*	4.00 *Agree*	4 *Agree*
53. I need more information on learning disabilities to help teach identified students.	3.93 *Agree*	4.00 *Agree*	4 *Agree*
54. I am aware of accommodations and modifications to assist students with learning disabilities.	4.30 *Agree*	4.00 *Agree*	4 *Agree*

Table 23 displays the results of an ANOVA test conducted on teachers' years of experience and their opinions on teaching students with a LD. The findings indicate that there were no significant relationships between years of teaching experience and their feelings towards teaching students with a LD.

Table 23

Analysis of Variance for Teachers' Years of Experience and Their Opinions on Teaching Students with a LD.

		Sum of squares	*df*	Mean square	*F*	Sig.
48. I understand learning disabilities enough to teach students with this identification.	Between groups	4.599	5	.920	.852	.515
	Within groups	139.282	129	1.080		
	Total	143.881	134			
49. I feel well informed about teaching students with a learning disability.	Between groups	8.881	5	1.776	1.284	.275
	Within groups	178.452	129	1.383		
	Total	187.333	134			
50. I feel prepared to teach students with learning disabilities.	Between groups	7.985	5	1.597	1.420	.221
	Within groups	145.096	129	1.125		
	Total	153.081	134			
51. I have adequate resources to teach students with learning disabilities.	Between groups	15.498	5	3.100	2.118	.067
	Within groups	188.828	129	1.464		
	Total	204.326	134			
52. I feel comfortable teaching students identified with a learning disability.	Between groups	4.830	5	.966	1.112	.357
	Within groups	112.029	129	.868		
	Total	116.859	134			
53. I need more information on learning disabilities to help teach identified students.	Between groups	1.758	5	.352	.399	.849
	Within groups	113.575	129	.880		
	Total	115.333	134			
54. I am aware of accommodations and modifications to assist students with learning disabilities.	Between groups	1.279	5	.256	.925	.467
	Within groups	35.654	129	.276		
	Total	36.933	134			

Tables 24 showcases the results of an ANOVA test conducted examining whether teaching position influenced the participants' opinions about teaching students with a LD. There were no significant relationships between the different groups of teachers and their confidence to teach students with LD in their classrooms.

Table 24

Analysis of Variance Test for the Teaching Position and Teachers' Opinions Towards Teaching Students with LD

		Sum of squares	*df*	Mean square	*F*	Sig.
48. I understand learning disabilities enough to teach students with this identification.	Between groups	14.105	8	1.763	1.678	.109
	Within groups	140.832	134	1.051		
	Total	154.937	142			
49. I feel well informed about teaching students with a learning disability.	Between groups	14.451	8	1.806	1.327	.235
	Within groups	182.374	134	1.361		
	Total	196.825	142			
50. I feel prepared to teach students with learning disabilities.	Between groups	8.284	8	1.035	.883	.533
	Within groups	157.171	134	1.173		
	Total	165.455	142			
51. I have adequate resources to teach students with learning disabilities.	Between groups	12.762	8	1.595	1.056	.398
	Within groups	202.440	134	1.511		
	Total	215.203	142			
52. I feel comfortable teaching students identified with a learning disability.	Between groups	7.536	8	.942	1.073	.386
	Within groups	117.667	134	.878		
	Total	125.203	142			
53. I need more information on learning disabilities to help teach identified students.	Between groups	6.521	8	.815	.952	.477
	Within groups	114.779	134	.857		
	Total	121.301	142			
54. I am aware of accommodations and modifications to assist students with learning disabilities.	Between groups	3.973	8	.497	1.660	.114
	Within groups	40.097	134	.299		
	Total	44.070	142			

Table 25 displays the results of the chi-square test that was conducted on participants if teachers had a family member with a LD and their confidence of teaching students with a LD. As can be noted in Table 25, there was no relationship between primary teachers who do or do not have a family member with a LD and their confidence in teaching students with LD.

Table 25

Chi-Square Test Close Family Member With a LD and Teachers' Opinions on Teaching Students With a LD

	YFM (n = 73)			NFM (n = 70)			
	Strongly disagree/disagree	Strongly agree/agree	Don't know	Strongly disagree/disagree	Strongly agree/agree	Don't know	X^2 (1)
48. I understand learning disabilities enough to teach students with this identification.	12	59	2	18	50	2	.390
49. I feel well informed about teaching students with a learning disability.	24	47	2	27	43	0	.282
50. I feel prepared to teach students with learning disabilities.	17	53	3	24	45	1	.248
51. I have adequate resources to teach students with learning disabilities.	42	30	1	40	28	2	.824
52. I feel comfortable teaching students identified with a learning disability.	10	53	0	12	56	2	.319
53. I need more information on learning disabilities to help teach identified students.	10	63	0	9	61	0	.703
54. I am aware of accommodations and modifications to assist students with learning disabilities.	0	73	0	2	67	1	.202

Note. YFM = Participant has a family member with LD, NFM = Participant does not have a family member with a LD.

As depicted in Table 26, no significant difference was found between participants who had a close friend with a LD and their comfort in teaching students with a LD.

Table 26

Chi-Square Test Close Friend With a LD and Teachers' Opinions on Teaching Students with LD

	YCF (n = 84)			NCF (n = 59)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
48. I understand learning disabilities enough to teach students with this identification.	16	65	3	14	44	1	.659
49. I feel well informed about teaching students with a learning disability.	27	56	1	24	34	1	.456
50. I feel prepared to teach students with learning disabilities.	24	57	3	17	41	1	.798
51. I have adequate resources to teach students with learning disabilities.	50	33	1	32	25	2	.592
52. I feel comfortable teaching students identified with a learning disability.	13	70	1	9	49	1	.947
53. I need more information on learning disabilities to help teach identified students.	13	71	0	6	53	0	.270
54. I am aware of accommodations and modifications to assist students with learning disabilities.	1	82	1	1	58	0	.681

Note. YCF = Participant has a close friend with LD, NFM = Participant does not have a close friend with a LD.

A chi-square test was conducted to determine if teachers' opinions on teaching students with LD were related to whether the teacher had attended a LD workshop or not. As depicted Table 27, question 49, which asked participants if they felt well informed about teaching students with a LD, was significant, $\chi^2(2, n = 129) = 0.003$, $p = 0.05$. This suggests that teachers who had attended a workshop on LD felt more informed about teaching students with LD than those who had not attended a LD workshop. It is interesting to note that in the results workshops did not necessarily affect teachers'

amount of knowledge about LD, although the results indicated that workshops created more confidence in teachers' ability to teach students with LD.

In addition, question 48, which asked participants if felt they understood LD enough to teach students with a LD, approached significance, $p = 0.055$. Specifically the teachers who had attended a LD workshop felt more strongly that they were prepared enough to teach students with LD compared to those teachers who had not attended a LD workshop.

Table 27

Chi-Square Test Participants Attended LD Workshop and Teachers' Opinions Towards Teaching Students with LD

	AW (n = 79)			NW (n = 50)			
	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	Strongly disagree/ disagree	Strongly agree/ agree	Don't know	X^2 (1)
48. I understand learning disabilities enough to teach students with this identification.	8	68	3	13	36	1	.055*
49. I feel well informed about teaching students with a learning disability.	17	62	0	23	25	2	.003*
50. I feel prepared to teach students with learning disabilities.	15	63	1	16	32	2	.124
51. I have adequate resources to teach students with learning disabilities.	44	34	1	28	20	2	.591
52. I feel comfortable teaching students identified with a learning disability.	5	73	1	10	39	1	.104
53. I need more information on learning disabilities to help teach identified students.	12	67	0	7	43	0	.707
54. I am aware of accommodations and modifications to assist students with learning disabilities.	0	78	1	1	49	0	.330

Note. AW = Participant has attended at least one workshop on LD, NFM = Participant has not attended a workshop on LD.
* p <0.05 indicating that a significant relationship is present.

In conclusion, generally teachers are confident and comfortable in their ability to teach students with a LD. The ANOVA tests did determine that the factors of years of teaching experience and teaching position did not influence a teacher's comfort level in teaching students with LD. Furthermore, the chi-square tests that examined the factors of primary teachers who have a family member or a close friend with LD also determined that these factors did not influence a teacher's comfort teaching students with LD. However, the chi-square tests did suggest that teachers who attended a workshop on LD not only felt more informed about teaching students with LD, they also felt more prepared to teach students with LD compared to those primary school teachers who had not attended a workshop on LD.

Support for Teaching Students with LD

Table 28 examines the support participants received to help them with teaching students with a LD (See Table 28.1 in Appendix D for the frequency of the responses). More than 55% of participants agreed or strongly agreed that they received support from a school board expert/consultant, vice-principal, or principal. Approximately 80% of participants stated that they received support from a resource teacher or another teacher in their school with teaching students with LD. Almost 60% of participants also receive support from an education assistant. Furthermore the mode and median for all of the questions in this section, except question 60, were *agree*. Question 60 asked participants if they received support for teaching students with LD from sources that were not mentioned in the other questions. Other areas of support identified from participants' comments were: teacher Facebook groups, parents, professional development sessions, books, Master of Education classes, volunteers, child youth worker, personal research,

internet, speech pathologists, occupational therapists, and educational psychologists. However, there were several comments from participants that indicated there was not enough support for teaching students with a LD. Seven of the 35 participants' comments mentioned that either their school board is limiting the number of education assistants or that the support in their school is going to students with behavioral problems, and students with LD were being missed. Furthermore, one planning time teacher mentioned that she has no support and has not seen any of her students' Individual Education Plans (IEP).

Table 28

Statistical Analysis of Participants' Responses for Support Teachers Receive for Teaching Students with a LD

Variable	Mean	Median	Mode
55. I receive support from a consultant or other school board experts to assist me with teaching students with learning disabilities.	3.34 *Don't know*	4.00 *Agree*	4 *Agree*
56. I receive support from my principal or vice-principal to assist me with teaching students with a learning disability.	3.13 *Don't know*	4.00 *Agree*	4 *Agree*
57. I receive support from a resource teacher to assist me with teaching students with a learning disability.	3.87 *Agree*	4.00 *Agree*	4 *Agree*
58. I receive support from other teachers at my school to assist me with teaching students with a learning disability.	3.87 *Agree*	4.00 *Agree*	4 *Agree*
59. I receive support from education assistants to assist me with teaching students with a learning disability.	3.28 *Don't know*	4.00 *Agree*	4 *Agree*
60. I receive additional support for teaching students with a learning disability from sources other than those mentioned above (please comment below).	2.71 *Don't Know*	2.00 *Disagree*	2 *Disagree*

Table 29 displays the results of an ANOVA test conducted on teachers' years of experience and the support they have received for teaching students with LD. Similar to the other findings they examined teachers' years of experience this ANOVA test also determined that there was no significant relationship between years of teaching

experience and the support teachers receive for teaching students with a LD.

Table 29

Analysis of Variance for Teachers' Years of Experience and the Support They Receive for Teaching Students with LD.

		Sum of squares	*df*	Mean square	*F*	Sig.
55. I receive support from a consultant or other school board experts to assist me with teaching students with learning disabilities.	Between groups	9.755	5	1.951	1.222	.303
	Within groups	205.979	129	1.597		
	Total	215.733	134			
56. I receive support from my principal or vice-principal to assist me with teaching students with a learning disability.	Between groups	9.168	5	1.834	1.115	.356
	Within groups	212.165	129	1.645		
	Total	221.333	134			
57. I receive support from a resource teacher to assist me with teaching students with a learning disability.	Between groups	4.681	5	.936	.772	.571
	Within groups	156.356	129	1.212		
	Total	161.037	134			
58. I receive support from other teachers at my school to assist me with teaching students with a learning disability.	Between groups	3.279	5	.656	.676	.642
	Within groups	125.047	129	.969		
	Total	128.326	134			
59. I receive support from education assistants to assist me with teaching students with a learning disability.	Between groups	6.351	5	1.270	.642	.668
	Within groups	255.383	129	1.980		
	Total	261.733	134			
60. I receive additional support for teaching students with a learning disability from sources other than those mentioned above (please comment below)	Between groups	2.324	5	.465	.295	.915
	Within groups	199.931	127	1.574		
	Total	202.256	132			

Table 30 examines the results of an ANOVA test conducted to determine if teaching position influenced the level of support teachers received. When looking at the ANOVA results, it can be seen that out of the six questions, three indicated there was no significant difference between the different groups' responses. A significant difference was found between teaching position and the support received from other teachers, *p*

<0.01. Specifically the grade 1, grade 2, and grade 3 teacher groups commented that they received less support from other teachers for teaching students with LD. It is possible that, for the other categories of teachers because of their teaching positions; they might be required to receive more support from one another. For example, split grade teachers are more likely to talk and seek advice and ideas from other teachers and planning time/prep teachers move among different classroom and therefore are more likely to talk to other teachers, especially the home room class teacher, on a regular basis about issues they are having or have noticed in the class. Furthermore special education and resource teachers would most likely talk to different homeroom teachers on a regular basis to see how the students with LD are doing. As a result, teachers who are teaching a single grade may not get as many opportunities to talk to other teachers about students in their class, as maybe they feel it is their responsibility to discover how best to help the students. Additionally, question 59, which asked participants if they received support from educational assistants to teach students with LD was also significant, p <0.044. This finding may be attributed to the fact that the grade 1 and grade 2 teachers stated that they did not receive support from an education assistant to teach students with LD, while planning time/prep teachers and substitute/supply teachers stated that they did receive support from educational assistants to teach students with LD.

Table 30

Analysis of Variance Test for the Teaching Position and Support Teachers Received for Teaching Students with LD

		Sum of squares	*df*	Mean square	*F*	Sig.
55. I receive support from a consultant or other school board experts to assist me with teaching students with learning disabilities.	Between groups	14.154	8	1.769	1.118	.355
	Within groups	212.055	134	1.583		
	Total	226.210	142			

		Sum of squares	*df*	Mean square	*F*	Sig.
56. I receive support from my principal or vice-principal to assist me with teaching students with a learning disability.	Between groups	20.354	8	2.544	1.613	.127
	Within groups	211.380	134	1.577		
	Total	231.734	142			
57. I receive support from a resource teacher to assist me with teaching students with a learning disability.	Between groups	5.976	8	.747	.627	.754
	Within groups	159.758	134	1.192		
	Total	165.734	142			
58. I receive support from other teachers at my school to assist me with teaching students with a learning disability.	Between groups	17.709	8	2.214	2.630	.010
	Within groups	112.767	134	.842		
	Total	130.476	142			
59. I receive support from education assistants to assist me with teaching students with a learning disability.	Between groups	30.150	8	3.769	2.064	.044*
	Within groups	244.661	134	1.826		
	Total	274.811	142			
60. I receive additional support for teaching students with a learning disability from sources other than those mentioned above (please comment below).	Between groups	38.460	8	4.807	3.719	.001**
	Within groups	170.618	132	1.293		
	Total	209.078	140			

* $p < 0.05$ indicating that a significant relationship is present.
** $p < 0.01$ indicating that a very strong significant relationship is present.

Question 60, which asked participants if they had received support for teaching students with LD from any other person/area that was not previously stated in the other five questions in this section was also significant, $p < 0.001$. Teachers teaching split class, planning time/prep teachers, substitute/supply teachers, and special education/resource teachers all stated that they had received additional support from areas that were not stated in the other five questions. The results suggest that teaching position influences the type of additional support received for teaching students with LD.

To examine the frequency of support received by the teachers, their responses were coded as follows; 1 = Daily, 2 = Weekly, 3 = Monthly, 4 = Once a Term (3 months), 5 = Once a Year and 6 = Never. The findings indicate that both the mode and median of the responses were 2 or weekly (See Table 31.2 in Appendix D). Specifically,

57.2% of participants reported receiving support on a weekly or daily basis to help teach students with a LD. Of the participants 38.6% indicated that they receive support weekly, 18.6% of participants receive support daily, and 15% receive support monthly. This indicates that approximately 72% of teachers were receiving assistance on a frequent basis. In contrast the data presented in Table 31.1 also indicates that 27.9%, one in four teachers, received support to teach students with LD only once a term, once a year, or never. That is, 3.6% of participants reported receiving support only once a year or term and 15.7% of participants reported never receiving support to assist teaching students with LD. Overall this suggests that while the majority of teachers are receiving regular support, a quarter of primary school teachers are not receiving support on a regular basis.

An ANOVA test was conducted on teachers' years of experience and how often they receive support for teaching students with a LD. The results of the ANOVA test were; $F(5,126) = 1.90$, $p = 0.1$. As a result, this ANOVA test determined that there was no significant difference between teachers' years of experience and support they receive to teach students with LD.

In conclusion, the majority of teachers receive their support for teaching students with LD from resource teachers and educational assistants, with a majority of the participants receiving support on a daily or weekly basis. However, interestingly, the findings also indicated that one fourth of teachers do not receive support for teaching students with LD on a regular basis. Furthermore, the ANOVA tests that were conducted also determined that teachers who teach split grades, planning time/prep teachers, or special education/resource teachers receive more support than single grade primary

teachers. However, it is important to note that a significant number of teachers did state that they feel they could use more support to teach students with LD.

What to Do if a Student has a Learning Disability

Table 32 displays participants' answers to a written response question that asked participants what steps they would take if they believed a student in their class had a LD. Each participant could have stated more than one category, as participants discussed the steps they would take if they believed a student in their class had a LD. Therefore, the count in Table 32 is the number of participants who stated they would do the specific action, while the percentage looks at how many of the 114 participants that answered the question stated they would do that action. Participants could have included multiple actions in their plan, and this is why the count does not add up to 114.

Table 32

Frequency Distribution of Participants' Responses to What They Would Do if They Suspect a Student in their Class had a LD

Variables	Percentages	Count
Accommodate or modify learning for student	7.9	9
Anecdotal records	33.3	38
Discuss with resource teacher	64.0	73
Do further investigating on the student	0.9	1
Fill out referral and send to resource teacher	0.9	1
Form a Plan of Action (growth plan) and prepare IEP	14.9	17
In school assessment	14.0	16
Meet with a school team	22.8	26
Meet/consult with parents	40.4	46
Provide differentiated instruction	1.8	2
Refer for psychoeducational assessment	12.3	14

Variables	Percentages	Count
Talk to previous teachers	13.2	15
Talk to principal/administration	19.3	22

The majority of participants (64.0%) stated that they would discuss the student's academics and next steps that should be taken with a resource teacher. In addition, 40.4% of participants discussed the importance of including the parents and communicating with the parents throughout the whole process of determining if their child had a LD. Furthermore, 33.3% of the participants talked about the importance of keeping anecdotal records, so that during the process there was a record of the student's struggles, growth, and documentations of characteristics the student portrayed in the classroom that made the teacher suspect the student had a LD. The importance of making these anecdotal records to bring to meetings with parents, administration, resource teachers, and psychologist to provide evidence as to why they believed a child might have a LD was another common action stated by participants.

Overview

One hundred and forty-three primary teachers from Ontario, Canada responded to the survey that was administered for this research. When assessing the findings on primary teachers' knowledge of typical characteristics of LD, the primary teachers in this study did have a well-established knowledge of these characteristics and were very confident in their understanding of LD classification. Additionally, the primary school teachers had a general understanding and knowledge on potential risk factors that may cause a student to develop a LD. However, their confidence in their knowledge on LD risk factors was not strong. Furthermore, primary school teachers are very knowledgeable

in knowing effective classroom strategies that would benefit students with a LD. This is the section in which primary school teachers were most knowledgeable.

The majority of primary school teachers reported that they were confident in their ability to teach students with LD and were comfortable teaching students with LD in their classrooms. Furthermore, a majority of teachers receive support to teach students with LD from resource teachers and educational assistants on a daily or weekly basis. However, one fourth of teachers received support only once a term, once a year, or never.

During the analysis, there were a number of cross-tab analyses that were conducted. The purpose of these cross-tab analyses was to determine if there were factors that influenced primary teachers' knowledge of LD. During the cross-tab analysis to determine if years of teaching experience contributed to teachers' knowledge of LD, there was no significant relationship determined in any of the tests. As a result, it can be determined that no relationship is present between teachers' years of experience and their level of knowledge about LD. It should be remembered, however, that most teachers in the sample had less than 10 years of experience. An analysis was conducted to determine if teaching position affected teachers' knowledge of LD. In this analysis there was limited significant difference between teaching position and primary school teachers' level of knowledge about LD. However, there was some support in different areas that did determine that some groups of teachers (teacher teaching split grades and special education teachers) have a better understanding of certain aspects of LD. It can be noted in this section that different groups (planning time teachers, split grade teachers, and special education teachers) of teachers do receive additional support from different areas.

Additional analysis was done to examine if primary teachers who have a family member with LD or if primary teachers who have a close friend with LD influenced their knowledge on LD. It was apparent in the analysis that primary teachers' level of knowledge on LD was not dependent on whether they had a family member with a LD. Primary teachers who have close friends with LD had significantly different knowledge of the relationship between head injuries, child abuse, and genetic factors and LD. However, no other difference between primary teachers' friendship with an individual who has a LD and their level of knowledge LD was found. Therefore there was not significant evidence to support that a primary school teacher having a close friend with LD affects their knowledge of LD.

Last, an analysis was conducted to determine if attending a workshop on LD affected a teacher's knowledge of LD. Overall, there was no significant evidence that teachers' level of knowledge on LD is related to whether they had attended a workshop on LD. However, there were a few instances where some important correlations were supported, such as, teachers who have attended a LD workshop felt that they understand LD and informed enough to teach students with a LD compared to those teachers who had not attended a workshop. Additionally, when examining characteristics of LD, teachers who had attended a workshop on LD did show traits of better understanding of typical LD characteristics, although, overall there is not sufficient evidence to state that primary teachers' level of knowledge on LD was dependent on whether they had attended a workshop on LD.

Chapter Five: Discussion

The purpose of this study was to examine primary teachers' knowledge of LD. It is important to examine primary teachers' knowledge of LD because primary teachers are among the first educators who come in contact with students; therefore, they would be among the first to screen or detect possible signs of a student having a LD and initiate some form of intervention. As a result, this study was conducted to determine if primary teachers' level of knowledge of LD is sufficient for assisting students with LD early in their education careers. Specifically, this study examined the following research questions:

1. What level of knowledge do primary teachers' have about LD?
2. Where do teachers get their knowledge about LD?
3. Do primary teachers believe they fully understand LD?
4. How frequently do primary teachers receive additional support for students with LD at school?
5. Are teachers comfortable teaching students with LD? Do they feel prepared enough to teach?

To answer these research questions, a survey was administered to Ontario primary school teachers through teacher Facebook pages. The 143 surveys were analyzed using frequency of responses, ANOVA, and chi-square tests. This section disseminates the findings as they pertain to each of the five research questions.

1. What level of knowledge do primary teachers' have about LD?

The findings of this study suggest that primary teachers' level of knowledge of LD changes depending on the specific area of LD that is being examined. When examining

primary school teachers' knowledge on the different classifications of LD, the participants were very confident and knowledgeable in the classifications of reading, writing, mathematics, and oral communication, with the majority of participants identifying the classifications. However, for one question there is a debate over the correct response (i.e., LD can be expressed as a significant disability in social skills). Many participants stated that it was a classification of LD; nonetheless, it was determined that there was no correct or incorrect response to this question. This is a result of there being disagreements in some of the literature over whether social skills issues are found in students with LD. There is convincing evidence that social skill problems are fairly common in students with LD as symptoms of their communication issues.

The findings of the current study also suggest that teachers have some knowledge of the risk factors that could result in the development of a LD; however, the teachers' level of knowledge and their confidence in their knowledge were low. For example, it was apparent in the results that only some of the teachers (48.6%) realized that infection in the central nervous system could increase the risk of a person having a LD. Thus, as previously discussed in the literature review, primary teachers may require further training to understand the concept of brain injury or neurological risk possibly affecting the development of the brain and the connection to LD. Consequently, primary teachers need more knowledge about possible risk factors of LD to ensure they can help detect students with LD early in their education careers. By knowing what the LD risk factors are, teachers can then keep a close eye on students to determine if they have LD. Early identification is key to ensure intervention occurs in order to help put the steps in place for students with LD to be successful in their education (Kirby, et al., 2005).

The findings of the current study contradict past research. For example, the current findings suggest that teachers' knowledge of the characteristics of LD is quite strong. In contrast, Wright (2008), who examined teachers' level of knowledge about nonverbal LD, found that a huge majority (95%) of teachers did not know the indicators/characteristics of someone with a nonverbal LD. The discrepancy between these two findings may be attributed to a number of factors. First, Wright examined teachers' knowledge of one specific classification of LD, nonverbal LD; meanwhile, the current research examined teachers' knowledge of all classifications of LD. Therefore teachers may be more likely to understand broader terms of LD than the specific classification of the diagnosis. A second factor that could result in the discrepancy between the two findings is that the current research included primary teachers who taught kindergarten to grade 3, while Wright examined teachers who had taught kindergarten to grade 8. Thus, the demographic of the teaching positions between the two studies were different. Additionally, a third factor explaining the difference could be because Wright's study was conducted eight years prior to this study. These factors may explain why the current study suggests that primary school teachers are well informed about the different characteristics of LD, compared to Wright's findings suggesting that teachers are not informed about nonverbal LD. Therefore, as teachers teach higher grades, their knowledge about LD may decrease. Primary school teachers may be more aware of the characteristics of LD because they are the first educators to come into contact with these students, compared to the demographic the Wright examined in which students might be identified with LD before reaching junior and intermediate grade. However, there are currently no studies to support these assumptions, as no studies have

examined teachers' level of knowledge of LD based on the grade they taught. Therefore, teachers who teach higher-grade levels might be less informed about the potential risk factors a student with a LD would portray.

Not only do the findings from the current study suggest that teachers are knowledge about LD, but they also suggest that the areas in which the teachers were most knowledgeable were accommodations and effective teaching strategies. Accommodations and effective teaching strategies are an important component of teachers' knowledge because they are the first measures teachers can put into action to help assist a student who they believe might have LD. It makes sense that this is the area in which teachers had the most knowledge because these are the strategies teachers use on a daily basis. However, Brook et al.'s (2000) research contradicted these findings. Brook et al.'s findings suggest that teachers' knowledge of LD is limited, which affects the teachers' ability to identify LD and provide students with appropriate accommodations. The inconsistency between these two studies' results may be attributed to the demographics of the teachers that were examined. Brook et al.'s study population was selected from teachers in Israel, while this study's sample population was selected from Ontario, Canada. There may be cultural differences or differences in teacher preparation between these two demographic regions that could have caused the difference between the suggested findings.

Additionally, Aladwani and Al Shaye's (2012) research findings also contradicted the current research findings. Aladwani and Al Shaye determined that teachers' knowledge about LD was insufficient and that they were unable to detect early signs that a primary student may have LD. Therefore, Aladwani and Al Shaye suggested that

primary teachers' knowledge of the characteristics and potential risk factors of LD are very limited. The findings from the current research suggest that the area in which primary teachers know the least is the potential risk factors that can cause a student to have a LD. Furthermore, the findings indicate that teachers have a great source of knowledge about the characteristics a student with a LD may portray. The disagreement between these two findings may once again be a result of the two different demographics that were examined. Aladwani and Al Shaye (2012) examined teachers in Kuwait, compared to this study that examined Ontario, Canadian teachers. There may be cultural differences or differences in teacher preparation between these two demographic regions that can be the cause of the vastly different results.

In relation to the theoretical framework of the current study, the findings suggest that primary school teachers are following the roles for educators that Dewey stated in his philosophies. Specifically, Dewey states that teachers are supposed to help guide students' learning (Noddings, 2012). In order for teachers to fulfill Dewey's philosophy to support and guide their students, teachers must have a base of knowledge about students' educational needs so that they can assist students according to their needs. The current research findings indicate that teachers have obtained enough knowledge of LD to help guide and support students with LD through their education. As a result, teachers might then be able to help students with LD to have the same academic opportunities as their peers. The findings also support Wolfensberger's Theory of Normalization (Wolfensberger & Tullman, 1982). Wolfensberger's Theory of Normalization states that every member of society has a right to a normal life and that different members of our society play different critical roles to ensure that those members of society that have

special needs are able to achieve a normal life. Since the primary teachers in the current study have a sufficient amount of knowledge on LD, they will be able to support students with LD to be successful academically and effectively function in society.

Overall the findings suggest that primary teachers have a high level of knowledge and understanding about effective teaching strategies that assist students with LD in their education. Teachers, however, have a weaker level of knowledge when it comes to risk factors that cause LD and typical characteristics of a student with LD. Therefore, teachers' level of knowledge is adequate for making adaptions to assist these students in the classroom. An area of improvement is the knowledge needed to help identify the students with a LD. The participants in this study did understand that there were different classifications of LD; however their knowledge and confidence in the characteristics that students with LD may portray was not as strong. This shows that primary teachers know how to accommodate students with a LD, but when it comes to identifying these students, their level of knowledge is weaker. This is the area that needs improvement, as it is important to identify students early so that a plan can be established and put in practice to help the students with LD succeed academically.

2. Where do teachers get their knowledge about LD?

Seventy-six percent of the participants believed they understood LD well enough to effectively teach students with LD, in their classrooms. In order for teachers to feel they can effectively teach students with LD they first need to obtain some knowledge about LD. The majority of participants in this study had obtained some knowledge of LD from completing some form of an additional professional development course or workshops in which they enrolled after graduating with their Bachelor of Education. A majority of

participants (88.2%) also stated that they obtained their knowledge of LD through an additional qualifications course in special education. Specifically the participants noted they had taken Special Education Part I as a requirement by their school board in order to gain employment. A minority of participants stated that they had increased their knowledge of LD from completing their Master of Education and through their own personal research (internet, books, etc.). Dewey's philosophy believes that teachers' involvement in students' education is one of the more important components in ensuring students have academic success (Noddings, 2012). As a result, teachers are responsible for keeping their knowledge current and up-to-date on educational information; this will ensure that they provide the most relevant support and education to their students. The findings from the research suggest that the majority of teachers are continuously learning and developing their knowledge of LD in multiple formats, such as taking courses or doing personal research.

Furthermore, the findings indicated that some teachers obtain their knowledge about LD from being in close contact with individuals who have been identified with a LD. Of the participants, 58.7% indicated that they had a close friend, sibling of a friend or roommate who had a LD while 51% of participants stated that they have a family member with a LD. There was a large number of participants who completed the survey and were closely connected to a person with LD. This could be because they might have been more motivated to complete the survey than those teachers who were not personally connected to someone with LD. It is interesting to note that the findings also suggest that the teachers' level of knowledge on LD was not related to having a close friend or family member with a LD. This finding corresponds to Saravanabhavan and Saravanabhavan's

(2010) research that indicated that familiarity with a person with a LD did not affect a teachers' level of knowledge of LD. Therefore, the findings of the current study further support that teacher's knowledge of LD may not be strengthened simply because of their relationship with individuals identified with LD.

The current research findings also suggest that teachers who had attended workshops on LD did know more about possible risk factors that can cause a student to have LD; however, their knowledge in other areas of LD (i.e., classification of LD, characteristics of LD, and effective classroom strategies for LD) was not affected. Some aspects of these findings are similar to Saravanabhavan and Saravanabhavan's (2010) and Wright (2008) findings, while some components are different. Saravanabhavan and Saravanabhavan's findings suggested that teachers who attend additional training (i.e., workshops) have a significantly higher level of basic knowledge of LD compared to teachers who do not attend a workshop on LD. Furthermore, Saravanabhavan and Saravanabhavan noted that poor training negatively influenced teachers' knowledge of LD and did not equip teachers with the necessary knowledge they need to teach students with LD. Consequently, if teachers did not get the training they needed, teachers would become overwhelmed, and this could result in the development of negative attitudes towards teaching students with LD. Therefore, Saravanabhavan and Saravanabhavan suggested that appropriate training was critical for teachers to not only improve their knowledge but also to positively impact their teaching attitudes towards students with LD.

The current research finding does not suggest that teachers who had attended a workshop on LD were more knowledgeable about basic facts of LD. However, the

current research findings did indicate that participants who attended a workshop on LD may have obtained more knowledge of the LD risk factors. The difference between these two studies (the current research findings and Saravanabhavan and Saravanabhavan's, 2010) may be a result of the different format of questionnaire that was administered and the format in which the analysis of the data took place. The questionnaire that was administered for the current research was separated into different sections based on the content of the knowledge the questions were targeting (i.e., characteristics of LD, potential risk factors of LD, effective classroom strategies, etc.). Therefore, for the analysis of the data that was collected during this study, primary teachers' knowledge was examined in each of the different sections of the survey separately. However, Saravanabhavan and Saravanabhavan's questionnaire was not organized in this format; instead their questions that examined different areas of knowledge were all categorized in one section. As a result, their analysis was also conducted examining the participants' knowledge overall and not broken down into the different categories. This resulted in the suggested findings from this current study determining a specific area in which the factor of attending a workshop increases teachers' knowledge of LD instead of an overall knowledge assessment.

As mentioned previously, the findings for the current study suggest that teachers who have attended a workshop on LD generally have developed more knowledge on risk factors that may cause an individual to have a LD. Wright's (2008) findings indicated that teachers' knowledge about LD was improved when they were given an information sheet about the disability. Both studies suggest that when teachers are given a resource, such as an information sheet or attending a workshop, their knowledge about LD

increases. As a result, professional development resources such as a workshop or information sheet may increase a teacher's understanding about LD and how to best assist students with LD with their academics.

As mentioned in the discussion pertaining to Question 1, the current research findings suggest that teachers have a well-established knowledge about LD. However, Abercrombie (2009) suggests that teachers need more training in special education so that they can fully understand how to support students with LD. Abercrombie also suggests that teachers' background and the institution they attended for school did not influence their level of LD knowledge. As discussed previously, Saravanabhavan and Saravanabhavan's (2010) findings suggested that teachers who attended workshop/training have a higher level of knowledge on LD than those who do not. The findings from this study suggested that this is not true in all categories of knowledge of LD; however it is true in regard to teachers' knowledge of potential LD risk factors. Through this study, the section in which primary teachers' knowledge of LD could improve the most is in the potential LD risk factors that may cause an individual to have a LD. The study determined that there was a difference in responses between those participants who had attended a workshop on LD compared to those participants who had not attended a workshop on LD. This may suggest that teacher training and workshops do influence their knowledge of LD. As a result the nature of the workshops provided to teachers on LD should be examined to see if they could be made more effective.

Desforges's theory (1995) states that experienced teachers are more knowledgeable about LD than new teachers because teachers gain their knowledge from experiences in the education setting. The findings from the current study suggest that the years of

teaching experience did not significantly affect teachers' knowledge of LD, which directly contradicts Desforges's theory. However, this discrepancy could be a result of the population of the participants who participated in this research, where 74% of the participants had been teaching or 10 years of less. This could cause a discrepancy because there were not an equal number of participants in each grouping. For example, there were 59 participants who had taught for 5 years or less, while only two participants had taught for 26 to 30 years. Therefore, when comparing the knowledge level between these two groups, the knowledge for those teachers teaching less than 5 years had 59 responses compared to only two responses from teachers teaching for 26 to 30 years.

In conclusion, the findings suggested that most primary school teachers obtained their knowledge of LD from professional development courses, workshops on LD, additional qualifications special education courses, or through personal reading. Furthermore, it can be noted that workshops on LD help increase teachers' knowledge of LD risk factors. Therefore, it is recommended that school boards continue to provide training to teachers and that the school boards assess their current training programs. It is important for school boards to assess their current training programs to ensure that they are of the highest standards, because the quality of the training affects the teachers' knowledge of LD; which, in turn, affects the teachers' ability to identify students with LD early in their education to provide them with the accommodation they need to succeed academically.

3. Do primary teachers believe they fully understand LD?

A large majority of participants (88%) had received training for teaching students with LD in the classroom through an additional qualifications course; however,

approximately one quarter of the primary teachers indicated that their knowledge of LD was not sufficient and that there was a need to increase their understanding of the disability. Although 76% of participants believed they understood LD well enough to teach students who have a LD, 23.8% of teachers believed they do not fully understand LD or were unsure of their own understanding of LD. This finding suggests that the majority of primary school teachers in this study have confidence in their understanding of LD and therefore believe they have sufficient knowledge of LD in order to teach these students. These findings are similar to Bennett's (2009) research pertaining to the inclusion of students with exceptionalities in the regular classroom. Bennett discovered that in general, teachers have a positive attitude towards the inclusion of students with exceptionalities in a regular classroom, where their positive attitude is a result of teachers believing that they are able to make adjustments to their teaching so that all students can succeed academically. In the present study, primary school teachers did note that they felt they had sufficient knowledge to teach students with a LD. Primary teachers believed that they were able to assist students with a LD through making appropriate accommodations and modifications, similar to Bennett's study, which stated that teachers were able to make adjustment to help all students succeed academically. Furthermore, Bennett did note that teachers are concerned that their limited training, classroom management, lack of support and resources, and collaboration between regular classroom teachers and special education teachers can establish a negative attitude towards inclusive classrooms. Though this current study did not determine that the factors mentioned contributed to negative attitudes, it did determine that teachers did feel as though they could have more support to teach students with a LD.

Greer and Meyen (2009) noted in their research that teachers' understanding of LD is important so that they are able to translate curriculum expectations into content that can be effectively taught to students with LD. Therefore, the more teachers know about LD, the more likely they will be able to teach the curriculum expectations using strategies that will work best for students' with LD learning needs. If teachers understand LD adequately, they will be more able to fulfill Dewey's philosophy that teachers have the role to guide students' learning. Additionally, teachers may also be able to support Wolfensberger's Theory of Normalization because they will be enabling students with LD to obtain an education equivalent to their peers, thereby ensuring that they are contributing members in today's society (Noddings, 2012; Wolfensberger & Tullman, 1982).

As with previous research (i.e., Mayes & Calhoun, 2007), the majority of the participants believed that they understand LD well enough to teach students with LD and have the confidence to improve/adapt their instructional practices to assist students who have LD. This supports Jordan et al.'s (2009) supposition that successful inclusion of students with a disability (e.g., LD) is dependent on teachers' confidence in their comfort level and preparedness to teach students with a LD. Inclusion of students in a regular classroom is important for the academic and social development success of students with LD (Jordan, et al., 2009). As a result, Jordan et al. suggested that teachers who have a positive perspective towards teaching students with LD are more likely to create an effective inclusive learning environment. Therefore, with 88% of participants in the current study feeling comfortable and confident in teaching students with LD in an inclusive classroom, their students should be more likely to experience academic success.

Saravanbhavan and Saravanbhavan (2010) noted in their research that teachers who have limited knowledge of LD might also have a negative attitude towards teaching students with LD. Furthermore, Kirby et al. (2005) noted that teachers might not be able to accommodate students with LD in their classes if their knowledge is limited. However, when teachers feel they understand LD well enough to teach students with LD, they are more willing and able to accommodate these students. Since the majority of the primary school teachers in the current study indicated that they understood and are comfortable teaching students with LD in the classroom, this suggests that they are more likely to have a positive attitude towards teaching students with LD. Furthermore, the findings also indicated that there are still areas for improvement in primary teachers' knowledge and confidence in teaching students with LD, as one quarter of the participants in the study did indicate that they did not feel they knew enough about LD to teach students with LD effectively. This number is high and should not be ignored. Of the 25% who indicated they did not feel they knew enough about LD to teach students with LD; 94% indicated they needed more information about LD, 42% indicated they had attended a workshop on LD, 81% had taken additional course in special education, 30% indicated they had done personal research on LD, while 76% stated they had done additional reading on LD. The findings of this study did not determine the best intervention to assist with teachers' understanding of LD, as none of the factors, such as additional courses, workshops, personal research, teaching experience and so on, was determined to be more effective in improving teaching knowledge of LD. The only factor that was shown to improve teachers' understanding of LD was that workshops helped increase teachers' understanding of potential risk factors that may cause students to have

LD.

4. How frequently do elementary school teachers receive additional support for students with LD at school?

The majority of participants, approximately 57%, did receive support for teaching students with LD on a daily or weekly basis. There is a concerning percentage of participants (27.9%) who stated they never or very rarely receive support for teaching students with LD. The majority of support the teachers received was from fellow teachers, resource room teachers, educational assistants, and school administration. Some teachers also received support for teaching students with LD from experts at the school board, interaction through teachers on social media, parents, books, personal research, Internet, speech pathologists, occupational therapists, and educational psychologists. Jordan et al. (2009) noted in their research findings that schools that have the most support available to their students and staff, have a higher achievement rate for those students with special needs who are educated in an inclusive classroom. This suggests that the amount of support teachers receive influences the academic progress of their students.

The majority of participants did agree that they received support from the various areas mentioned above; numerous participants commented that they did not feel they received enough support to assist them with teaching students who have LD. Of the 35 comments provided in this section, seven of the participants stated they felt the support provided was not adequate. Some indicated that their school board had limited educational assistant support in the school or that the support that was once provided to assist teachers with teaching students with LD was being taken away and put towards

students with behavioural difficulties. Moreover, a planning time teacher stated that she had no support and, as of the time in which she participated in the survey, she had yet to see any of her students' Individual Education Plans (IEP), even though she knew that some of her students have been identified with LD. If teachers do not receive adequate support to teach students with LD, this can then affect their attitude towards teaching these students, consequently affecting the educational instruction these students receive from their teachers. Desforges (1995) believed that teachers' attitudes toward students contributed to the teaching instruction the students received. Therefore, if teachers become overwhelmed because they are not receiving adequate support to teach students with LD, it may have a negative outcome towards the quality of instruction the teachers are providing students with LD and also the other students in the classroom. Teachers play an important role in teaching students with LD and assisting them to succeed; however when teachers are overwhelmed and are not provided the adequate support of resources needed, they are not able to provide the students with LD with the education and support they need to succeed (Brook et al., 2000). There are many factors that may cause a teacher to become overwhelmed. These include: insufficient preparation, teachers' amount of responsibility, and limited support teachers receive; these have a negative effect on teachers' knowledge of LD and understanding of how to effectively teach students with LD (Aladwani & Al Shaye, 2012; Greer & Meyen, 2009; Kirby et al., 2005; Saravanbhavan & Saravanbhavan, 2010). Additionally, if teachers are not getting the support they need, it ultimately could reflect on the education they give to their students.

Interestingly, the current findings suggest that the teaching position of a participant

affected the amount of support the participant received throughout the school year. The findings in the study indicated that different grade teachers received different support; grade 1, grade 2, and grade 3 teachers stated they received less support from fellow teachers compared to special education, split grade (teaching two grades in a classroom), and planning time/prep teachers. Furthermore, grade 1 and grade 2 teachers also stated that they did not receive as much support from educational assistants as other teachers did. This could be a result of the other teaching positions requiring more support from their peers. For example, split grade teachers might communicate and get advice from two different grade level teachers who might be teaching the same grades as them.

Overall, while approximately half of the teachers indicated that they received support on a consistent daily/weekly basis, about a quarter of teachers indicated that they did not receive regular support to assist teaching students with LD. This is an important finding because schools that have the most support for teachers of students with special needs have a higher achievement rate compared to schools that receive limited support (Jordan et al., 2009). Furthermore, as both Bennett (2009) and Desforges (1995) suggest, a lack of support may cause teachers to have a negative attitude towards inclusive classrooms and students with a LD, which in turn may affect the type and level of support students with a LD will receive. As a result, the type and level of support teachers receive influences the quality of teaching they are able to provide students with LD in the classroom.

5. Are teachers comfortable teaching students with LD? Do they feel prepared enough to teach?

A general consensus among the primary school teachers who participated in the

study was that they felt comfortable teaching students with LD. Additionally, the majority of participants believed they had an adequate understanding of LD, were well informed about how to teach students with LD, and were prepared to teach these students. Teachers' attitudes, comfort level, and beliefs about their ability to teach students with LD may contribute to their ability to effectively accommodate and identify these students early (Abercrombie, 2009). It is important for teachers to feel prepared and comfortable to teach students with LD so that they can identify and accommodate students early in their education careers to help reduce the psychological factors that may occur if intervention does not occur until later in the students' education (Spitzer & Aronson, 2015). Spitzer and Aronson (2015) stated that the longer it takes a child to get identified with a LD and the longer it takes for intervention to occur, the greater the likelihood that he/she will fall further behind in his/her education, thereby creating an atmosphere for a child to develop many psychological difficulties.

A large majority (86.7%) of primary school teachers in the current study stated that they need more information about LD, particularly in the form of resources, in order to help them identify students who have LD. If teachers do not have adequate access to appropriate resources, they will not be able to sufficiently accommodate students with LD (Kirby et al., 2005). The teachers also stated that if they had greater access to LD resources, it would increase their comfort level and preparedness to teach students with LD. If these teachers do not have their access to LD resources increased, it could result in poor instructional strategies for their students with LD (Aladwani & Al Shaye, 2012; Greer & Meyen, 2009; Kirby et al, 2005; Saravanbhavan & Saravanbhavan, 2010). This decrease in the quality of instructional strategies may be the result of the lack of

confidence the teachers have in their teaching abilities (Jordan et al., 2009). By providing additional support to teachers, schools will be able to increase the academic achievement of their identified students (Jordan et al., 2009).

The primary school teachers in the study do have a well-established knowledge of LD. However, their knowledge does differ slightly between different components of LD. The primary school teachers did have a high level of knowledge about effective teaching strategies to assist students with LD in their academics; however their level of knowledge was not as high in regards to potential risk factors that may cause someone to have a LD and characteristics of LD. Specifically, the primary teachers were good at accommodating students with LD in their classrooms, but were not as knowledgeable at identifying the possible characteristics students with LD may portray. Most teachers obtained their knowledge of LD from professional development courses, LD workshops, additional qualifications courses, or through personal research. Additionally, participants who had attended a workshop on LD did have more knowledge about LD risk factors. However, on a daily basis, one third of the teachers did not feel they received adequate support or resources. Although, this study's findings indicate that teachers felt they need more access to appropriate resources pertaining to LD to become more effective in teaching students with LD, the majority of teachers felt comfortable and prepared to teach students with LD in their classrooms.

Chapter Six: Conclusion

Limitations of Study

There are limitations with almost every study. This research is no different, and there are multiple limitations that need to be considered in relation to the findings of the current research. A main limitation in this study is the fact that the survey was conducted through the Internet, which limited the sample pool to people who had access to a Facebook account. Therefore, the portion of the population that did not have access to Facebook was not represented. In addition, some members of Facebook may have been hesitant to complete a survey presented on the website because of stigma. To help with this limitation, the survey was also e-mailed through Dr. Lorraine Frost to other faculty at Nipissing University's Schulich School of Education, in which faculty were asked to forward the e-mail on to individuals who they believed would be suitable participants in the research. Additionally, when analyzing the data, it needs to be cautioned that on Facebook there is a possibility that an individual's true identity may not always be the same as what is presented. For a precaution, it was asked if the participant was a primary school teacher. If they responded no, their responses were not included in the data analysis. However, when analyzing the data it should be taken into consideration that someone might have completed the survey that was not a primary school teacher and answered the questions falsely.

A second limitation that needs to be acknowledged is that since the survey was conducted on-line, participants had access to the Internet to look up information as they were completing the survey. Fluid Survey does not contain time limits, which then permits the participants to look up the responses on the Internet. However, Fluid Survey

does show in the data analysis section how long it took each participant to complete the survey. As a result, if a participant took a time that was significantly longer than other participants and there was suspicion that he/she could have been searching the answer on-line, his/her survey responses would not have been included in the data analysis. Additionally, Fluid Surveys also provided an average time in which it took all participants to complete the survey. Once the data collection was completed, it took the 188 participants an average time of 15 minutes and 47 seconds to complete the survey. Furthermore, no participants took a significantly longer time than other participants to complete the survey, which limited the likelihood of a participant searching the web for possible answers.

Third, there was a considerable difference in the male to female ratio of the participants in this study. As it turned out, almost 97% of participants were female during the data collection. Although Statistics Canada states that 86.3% of primary teachers are females, there was a disproportionate number of females who took part in the study not consistent with the percentage of actual females primary school teachers (Canada, 2013). As a result, when analyzing the data we must make note that almost the whole population of the data collection came from females, while only a minority (less than 4%) came from male primary school teachers.

Fourth, a large (approximately 43.7%) number of participants who completed the questionnaire had been teaching for 5 years or less, while a large majority (approximately 74%) of participants had been teaching for 10 years or less. Therefore, when wanting to analyze if years of experience teaching had an effect on teachers' level of knowledge

about LD, this is very difficult, and results would be more informative if there was an even spread of years of experience.

A final limitation was noted by one of the participants in the study. The participant mentioned that the level of knowledge a teacher has about a LD may be a result of the institution or program where the teacher received the Bachelor of Education or additional special education courses. Therefore, it is noted that there is a difference in the quality of professional development experiences among participants that has not been reflected in the questions asked in the survey. The survey questions asked merely the number of courses that participants attended. Several institutions may be doing well at preparing teachers' knowledge of LD, while others may not. Therefore, a limitation in this study is that the quality of education received from certain institutions was not used to determine the participants' knowledge of LD. The number of courses completed was used as a measuring tool of teachers' knowledge.

Recommendations

There are a number of recommendations that can be made for future studies examining primary teachers' knowledge of LD. One recommendation would be to use a mixed methods approach, as the mixed methods research allows the researcher to collect both quantitative and qualitative data. By collecting both qualitative and quantitative data, the researcher could extend the understanding of primary teachers' knowledge of LD developed in this study. Furthermore, by including qualitative data, researchers could interview or also go into a classroom and observe teachers' interactions with students with LD. By conducting this type of research, the researcher could determine how the knowledge of LD a teacher has affects how they teach, identify, and assist students with

LD in the classroom. This information would then be able to answer more complex research questions, such as, how does teachers' level of knowledge affect students with LD?

A second recommendation for future researchers looking at conducting this research again would be to make modifications to the survey. A number of participants commented that the questions looking at the specific knowledge of LD were too broad and therefore needed to be more specific. A couple of participants commented that the wording of "typical characteristics" did not make sense, because each student with a LD has different characteristics. Therefore it is recommended that a longer preamble to the survey be given to the participants so that they better understand how to respond. In order to deal with the issues of the wording of questions and their broadness, a suggestion might be that the survey include a couple of scenarios of a LD and/or non-student with LD in the classroom. The survey could ask questions about the student in the scenario. The researcher could analyze if teachers would be able to identify a student with LD in the classroom through a more realistic scenario than just by the amount of knowledge that they have about the disability. This might measure more of primary teachers' knowledge of LD, as the participants have all been given the same information about the students and the researcher can analyze participants' knowledge of LD by the answers provided. Additionally, it is recommended that separate questions about accommodations and modifications be included in the survey, as those are two completely different instructional methods that are or are not provided to a student.

A third recommendation would be to have a larger population of participants. The findings were limited because of the small population of participants who took part in the

survey, especially when examining cross analysis with years of experience or gender. There were not enough males or teachers teaching for more than 15 years to determine if the findings were true for the whole primary teacher population or just for the participants in this survey. Therefore, in order to get a more confident statement about the findings in this survey, it is suggested that a larger population of primary teachers be studied. A larger sample population would help determine if a stronger correlation does exist between primary teachers' level of knowledge about LD and the different cross analyses that occurred. The small differences noted in the cross analysis section might be more present in a larger sample.

Finally, the last recommendation would be to look at a specific population of teachers when assessing primary teachers' knowledge of LD. As a result of this survey being administered through Facebook, primary school teachers around the world participated in the survey. However, only the surveys completed from teachers in Ontario were analyzed, as there were not enough teachers from other provinces or countries for effective analysis. The large majority of the participants were from Ontario; therefore I focused only on the Ontario participants to get a more in-depth analysis of Ontario primary teachers' knowledge on LD instead of focusing on a less in-depth worldwide group of teachers. As a result, a limitation of this study is that it did not compare primary teachers from different regions in Canada or the world to see if a difference was present in their knowledge of LD. Furthermore, this study analyzed primary school teachers all over Ontario and not just teachers from a specific region, school board, and so on. Consequently, the researcher might have to choose a different method of recruitment other than Facebook to administer the survey to the research study population.

Additionally, the research could also examine the different institutions teachers attended to determine if different offerings of special education courses affect the teachers' knowledge.

As a consequence of this research, there are recommendations for future studies, but also a number of recommendations for schools, school boards and the Ministry to Education. One recommendation would be for schools, school boards and the Ministry of Education to provide workshops specifically on LD. The findings from this study suggested that workshops on LD helped to increase teachers' knowledge of LD risk factors, although their knowledge in other areas concerning LD was not different from those who had not attended workshops. This means that teachers who attend workshops on LD are more aware of risk factors that may cause a student to develop a LD, where, this knowledge can assist teachers in identifying possible students with a LD early in their education career. As discussed by Felton (1992) and Reschly (2005) early LD identification is critical for students as it ensures that they get the support they need for academic success. As a result it is recommended that school boards and the Ministry of Education continue to offer workshops on LD for primary school teachers, as these workshops allow teachers to have an increased level of knowledge on potential LD risk factors that can be used to help foster early identification for students with a LD. The earlier a student with a LD is identified the earlier the student can have access to the appropriate accommodations and modifications needed for him/her to succeed academically. Additionally, it is recommended that the content of workshops being offered should be examined as there were some areas of teachers' knowledge that were not affected by attending a workshop.

A second recommendation for school, school boards, and the Ministry of Education would be for them to evaluate the level of support given to students who have a LD and their teachers. Jordan et al., 2009, noted that schools that provide the most support to their students, teachers, and other staff members have higher achievement from their students with a LD compared to school whose members are not given adequate support (Jordan et al., 2009). Hence, it is recommended that schools and school boards evaluate their support given to students with a LD to ensure sufficient support is given to these students and all members involved in students with a LD education.

Future Studies

The data collection through this research expanded the field of knowledge pertaining to primary teachers' understanding of LD; however, there are multiple areas for further expansion. A next step would be to have a case scenario experiment to examine if primary teachers are able to use their level of knowledge about LD in order to identify students with LD. This is important to examine because, as discussed in the literature review, early detection of LD is crucial to a student's with LD academic success. This study did not determine teachers' ability to use their knowledge in the classroom to identify students with LD and to implement the intervention needed to ensure academic success for these students. Hence, future studies in the area of primary teachers' knowledge of LD should examine teachers' ability to use their knowledge to identify students early in their education.

Implication

The main implication of this study is the impact that teachers' knowledge may have on the early identification of students with LD in their education progress. This

study determined that teachers excelled in their knowledge of effectively accommodating students with LD in the classroom. However, primary school teachers were weaker in their knowledge of knowing potential risk factors or characteristics a child with LD might portray. These two areas of knowledge are both important to help screen for and identify possible students with LD in the classroom. Early identification is important because it allows the students to have access to the proper assistance they need to help them improve in their learning before they fall too far behind their peers (Felton, 1992). As a result, schools and school board officials should ensure that teachers are equipped with the knowledge and resources needed to help screen for possible students with LD in the younger grades (kindergarten/primary) so that these students with LD can be identified and provided the accommodation and modification to succeed in his/her education.

Conclusion

In conclusion, this study did determine that primary teachers have a great deal of knowledge when it comes to effective teaching strategies for students with LD. Although teachers have an adequate understanding of possible risk factors, classifications, and characteristics of students with LD, there are still areas for improvement. Specifically, primary teachers can expand their knowledge to ensure that they are able to recognize students who have LD. Such knowledge would enable primary teachers to implement intervention strategies within the first few years of the students' education. As teachers mainly acquire their knowledge of LD from professional development courses, LD workshops, personal reading on LD, or through additional special education courses they have taken, school boards and the Ministry of Education need to encourage and support teachers' ongoing professional development through these venues.

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Appendix A

Advertisement for Participants to Participant in Study

First Post on Facebook

My name is Julie Kocsis and I am a Master of Education student at Nipissing University. I am currently completing a thesis on primary teachers' opinions of teaching students with learning disabilities.

If you have taught junior kindergarten to grade 3 (ages 4 to 9) I am inviting you to participate in my survey.

The survey should take approximately 25 minutes of your time and can be accessed at http://fluidsurveys.com/surveys/kocsis/primary-teachers-opinions-of-ld/

At the end of the survey, you have the option to enter your e-mail address (which will not be linked to your survey responses) for a chance to win one of five $25 Chapters gift cards.

The survey will close on November 18, 2014, 11:59 p.m.

Thank you for your time,

Julie Kocsis

Reminder Note Posted on Facebook, 2 Weeks Later

Dear Teachers,

If you have already completed my survey about primary grade teachers' opinions of teaching students with learning disabilities, thank you. If you have not yet completed the survey, I am encouraging you to participate.

If you have taught junior kindergarten to grade 3 (ages 4 to 9) I am inviting you to participate in my survey.

The survey should take approximately 25 minutes of your time and can be accessed at http://fluidsurveys.com/surveys/kocsis/primary-teachers-opinions-of-ld/

At the end of the survey, you have the option to enter your e-mail address (which will not be linked to your survey responses) for a chance to win one of five $25 Chapters gift cards.

The survey will close on November 18, 2014, 11:59 p.m.

Thank you for your time,

Julie Kocsis

Message Dr. Lorraine Frost was e-mailed to the Faculty of Education Professors at Schulich School of Education, Nipissing University

Dear Colleagues

I am forwarding this e-mail message from Julie Kocsis. I am supervising her Master's thesis. Would you kindly advertise this research study to any primary level teachers you may know?

Thank you for your support,

Lorraine Frost

Appendix B

Participant Information Letter

NIPISSING UNIVERSITY

Participant Information Letter for Anonymous Participants

You are asked to participate in a research study entitled Primary Teachers' Opinions of Learning Disabilities conducted by Julie Kocsis from the Master of Education program at Nipissing University. *The results of this study will contribute to a thesis.*
If you have any questions or concerns about the research, please feel free to contact Julie Kocsis by phone at 705-828-4411 or through e-mail at jakocsis483@community.nipissingu.ca. You may also contact Dr. Lorraine Frost, Thesis Advisor, Schulich School of Education, by phone at 705-474-3450, ext. 4563 or by e-mail at frost@nipissingu.ca .

The purpose of this research is to explore primary teachers' opinions of learning disabilities. Learning disability is the most common special education identification in school. The first point of contact students with a learning disability have at school is primary teachers. Additionally, early identification of learning disabilities is important for the students' future educational success. Therefore this survey aims to explore primary teachers' opinions about teaching students with learning disabilities.

Participation Procedures
If you volunteer to participate in this study, we would ask you to:

Complete the attached questionnaire. The questionnaire will take approximately 25 minutes to complete. The questionnaire will be available for 6 weeks after the original Facebook posting. You may complete it at your leisure. You will need a computer and Internet access. Once you are finished answering the questions please press SUBMIT.

Any information that is obtained from you in connection with this study is anonymous. Participation in this study is voluntary and you are free to withdraw at any time. You have the right to refuse to answer any question(s) that you find objectionable or which make you feel uncomfortable. Completion of this survey signifies your informed consent. Please keep a copy of this information letter for your records.

If you would like to receive the results of the study please provide your e-mail address at the end of the survey. It is anticipated the final report will be available by July 2015. Please be assured that your e-mail address will not be associated with your questionnaire. Your participation in this survey will remain anonymous. The software used to create this survey will separate the page with your contact information from your responses. Your e-mail, if provided, will be used to provide you with further information about the outcome of the research. It will only be used for the purpose of providing this information to you. It will not be given to anyone or be used for any other purpose. Currently, there are no foreseeable secondary uses for the data collected. However, the results may be

published in professional or academic journals and presented at professional or academic conferences.

There are no known risks to the participants in this study.

There are a number of benefits from your participation in this study, as it will help gain insight into teachers' opinions on teaching students with learning disabilities. The findings may be used to help develop more appropriate professional development programs to assist primary teachers in identifying and educating learning disabled students.

There are a number of benefits to society that can be expected from the findings of this research. There will be a better understanding of primary teachers' perceptions of students with learning disabilities. Furthermore, educational policymakers and school administrations will be able to use the findings as a basis for policy and action. Lastly, teachers, parents and community members who see the results will be more informed about learning disabilities.

All participants will have an opportunity to be randomly selected to receive one of five $25.00 Chapters gift cards. If you would like to be placed into the random selection, please provide an e-mail address at the end of the survey. As mentioned previously, your survey responses will not be matched or stored with your email address.

All information and data collected by participants will be kept completely confidential. Participants will remain anonymous throughout the entire research collection and analysis of data.

Any information that is obtained from research participants in connection with this study is anonymous.

Participation in this study is voluntary and you are free to withdraw at any time. You have the right to refuse to answer any question(s) that you find objectionable or which make you feel uncomfortable.

Completion of this survey signifies your informed consent. Please keep a copy of this information letter for your records.

This study has been reviewed and received ethics clearance through Nipissing University's Research Ethics Board.

If you have questions regarding your rights as a research participant, contact:

Ethics Coordinator, F309	**Telephone: 705-474-3450, ext. 4055**
Nipissing University	**E-mail: ethics@nipissingu.ca**
North Bay, ON P1B 8L7	**Fax: 705-474-5878**

Appendix C

Survey Administered to Participants on Fluid Survey

Part I: Learning Disability Opinion Survey

Part 1:
For each statement, select the descriptor that best represents your opinion about the characteristics of a learning disability.

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
1. A learning disability can be expressed as a significant disability in reading.**					
2. A learning disability can be expressed as a significant disability in communication.**					
3. A learning disability can be expressed as a significant disability in written language.**					
4. A learning disability can be expressed as a significant disability in mathematics.**					
5. A learning disability can be expressed as a significant disability in social skills.**					
6. A learning disability can be expressed as a significant disability in oral language.**					
7. A person with a learning disability can also be identified with another disability.**					
8. A person with a learning disability can also be identified as gifted. **					
9. Fidgeting is a typical characteristic of a student with a learning disability.*					
10. Shouting out is a typical characteristic of a student with a learning disability.*					
11. Hitting is a typical characteristic of a student with a learning disability.*					
12. Slower processing speed is a typical characteristic of a student with a learning disability.*					
13. Difficulty comprehending written materials is a typical characteristic of a student with a					

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
learning disability.*					
14. Difficulty with sentence structure is a typical characteristic of a student with a learning disability.*					
15. Excellent spelling is a typical characteristic of a student with a learning disability.*					
16. Good ability to express ideas is a typical characteristic of a student with a learning disability.*					
17. Difficulty copying notes from the chalkboard is a typical characteristic of a student with a learning disability.*					
18. Good ability to use phonics is a typical characteristic of a student with a learning disability.*					
19. The severity of a student's learning disability fades with age.*					
20. Atypical human growth is a characteristic of a student with a learning disability. *					

If you would like to provide additional comments about typical characteristics for students with a learning disability, please provide them in the text box below.

- Text box

Part 2:

For each statement, select the descriptor that best represents your opinion on the risk factors that cause learning disabilities.

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
21. A family history of learning disability increases the risk of having a learning disability. **					
22. Poor nutrition increases the risk of having a learning disability. **					
23. A history of head injury increases the risk of having a learning disability. **					
24. Child abuse increases the risk of having a learning disability. **					
25. Complications during pregnancy increase the risk of having a learning disability. **					
26. Lead poisoning increases the risk of having a learning disability. **					
27. Lack of parental support increases the risk of a learning disability. **					
28. Infection in the central nervous system increases the risk of having a learning disability. **					
29. Cancer treatment increases the risk of having a learning disability. **					
30. Poor parenting style increases the risk of having a learning disability. **					
31. Low child activity level increases the risk of having a learning disability. **					
32. Cultural practices increase the risk of having a learning disability. **					
33. Poor living environment increases the risk of having a learning disability. **					
34. Taking medication increases the risk of having a learning disability. **					
35. Genetic factors increase the risk					

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
of having a learning disability. **					
36. Neurological factors increase the risk of having a learning disability. **					

If you would like to provide additional comments about risk factors for students with a learning disability, please provide them in the text box below.

- Text box

Part 3:

For each statement, select the descriptor that best represents your opinion on teaching strategies for students with learning disabilities.

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
37. You need to have an Individual Education Plan before providing modifications and accommodations to students with a learning disability. **					
38. The students need to be formally identified with a learning disability before you can provide them with modifications and accommodations.**					
39. Differentiated instruction is an effective classroom strategy to use for students with a learning disability.*					
40. Direct instruction is an effective classroom strategy to use for students with a learning disability.*					
41. Providing more work is an effective classroom strategy to use for students with a learning disability.*					
42. Breaking lessons down into smaller parts is an effective classroom strategy to use for students with a learning disability. *					
43. Giving a student a computer is an effective classroom strategy to use for students with a learning disability. **					
44. Instructing students to work by themselves is an effective classroom strategy to use for students with a					

learning disability.**					
45. An effective classroom strategy for students with a learning disability is to present information orally and not in writing. *					
46. Using graphic organizers is an effective classroom strategy to use for students with a learning disability. **					
47. Medication should be used to reduce the severity of a student's learning disability. **					

If you would like to provide additional comments about effective classroom strategies for students with a learning disability, please provide them in the text box below.

- Text box

Part 4:

For each statement, select the descriptor that best represents your opinion on teaching students with learning disabilities.

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
48. I understand learning disabilities enough to teach students with this identification. *					
49. I feel well informed about teaching students with a learning disability. *					
50. I feel prepared to teach students with learning disabilities. *					
51. I have adequate resources to teach students with learning disabilities. **					
52. I feel comfortable teaching students identified with a learning disability.*					
53. I need more information on learning disabilities to help teach identified students. **					
54. I am aware of accommodations and modifications to assist students with learning disabilities. *					

If you would like to provide additional comments or opinions about students with learning disabilities, please provide them in the text box below.

- Text box

Part 5:

For each statement, select the descriptor that best represents your opinion on support for teaching students with learning disabilities.

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
55. I receive support from a consultant or other school board experts to assist me with teaching students with learning disabilities. **					
56. I receive support from my principal or vice-principal to assist me with teaching students with a learning disability.**					
57. I receive support from a resource teacher to assist me with teaching students with a learning disability. **					
58. I receive support from other teachers at my school to assist me with teaching students with a learning disability. **					
59. I receive support from education assistants to assist me with teaching students with a learning disability.**					
60. I receive additional support for teaching students with a learning disability from sources other than those mentioned above (please comment below).*					

If you would like to provide additional comments or opinions about support your receive for teaching students with a learning disability. Please provide it in the text box below.

- Text box

	Never	Daily	Weekly	Monthly	Once a Term (3 months)	Once a Year
61. How frequently do you receive support for teaching students with learning disabilities?*						

62. You suspect a student in your class has a learning disability; how should you proceed?**

- Text box

Part II: Demographic

There is a text box after each question for comments you may wish to add.

63. Are you currently teaching? *
    a. Yes
    b. No

    If no, please continue to question 65

64. Are you teaching, **
    a. Full-time
    b. Part-time
    c. Supply/Substitute teacher
    d. Other: Please comment

65. In which country are you located? *
    a. Text box

66. In which province/state/county are you located?*
    a. Text box

67. Have you ever taught Kindergarten to grade 3 in the past?**
    a. Yes
    b. No

68. What level do you currently teach? *
    a. Pre/junior Kindergarten (age 4)
    b. Senior Kindergarten (age 5)
    c. Grade 1
    d. Grade 2
    e. Grade 3
    f. Other: please comment

69. What is your current position in the education system?*
    a. General education teacher
    b. Special Education teacher
    c. Other: Please comment

70. Gender*
    a. Male
    b. Female
    c. Other

71. How many years of completed teaching experience do you have as of June 2014?
    ____ *

72. Since completing your teacher education have you completed further professional development or study in special education? *
    a. Yes
    b. No
    If no, please skip to question 79.

73. Have you attended any workshops on learning disabilities? *
    c. Yes
    d. No
  If no, please skip to question 75.

74. How many days of workshops on learning disabilities have you attended? *
    a. 1
    b. 2
    c. 3
    d. 4
    e. 5 or more

75. Have you completed any additional courses in special education since completing your teacher education? *
    a. Yes
    b. No
    If no, please skip to question 77.

76. How many special education courses have you completed?*
    a. 1 half course (approximately 36 hours)
    b. 1 Full course (approximately 72 hours)
    c. 1.5 courses (approximately 108 hours)
    d. 2 courses (approximately 144 hours)
    e. 2.5 courses (approximately 180 hours)
    f. 3 courses (approximately 216 hours)
    g. Other: Please comment

77. Have you completed any personal research on special education since completing your teacher education?*
    a. Yes
    b. No
    If yes, please describe the research you have completed.
    - Text Box

78. Have you completed any personal reading on special education since completing your teacher education?*
    a. Yes
    b. No
    If yes, please describe the material you have read.

- Text box

79. Do you have any close friends with a learning disability?**
    a. Yes
    b. No
        Comment: text box

80. Do you have any close family members with a learning disability?**
    a. Yes
    b. No
    Comments: text box

81. Thank you for your time and participation in this research survey. If you would like to receive a summary of the research findings please provide your e-mail address in the text box below. It is anticipated that the final report will be available by July 2015. (Please be advised that the e-mail address will only be used to send a summary of the research to you.)
    a. Text Box

82. As an appreciation for your participation in this research you are eligible to win one of five $25 gift cards to Chapters. If you would like to be entered into the draw please provide your e-mail address in the text box below. Only winners will be contacted. (Please be advised that the e-mail address provided will only be used to contact you if you have won one of the gift cards.) The draw will be completed when the survey closes six weeks after the initial posting on Facebook.
    a. Text Box

* Question was created from Ko (2007), Parker (2006), Brown (2007) or Wright (2008).
** Question was created based on findings from the literature review.

Appendix D

Frequency of Participants' Responses to Questions in Part One of the Survey

Table 4.1

Frequency Distribution Participants' Responses to Characteristics of LD

Variable	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know	
1. A learning disability can be expressed as a significant disability in reading.	1 *0.7%*	4 *2.8%*	57 *40.4%*	77 *54.6%*	2 *1.4%*	*Total:* 141
2. A learning disability can be expressed as a significant disability in communication.	3 *2.1%*	5 *3.5%*	62 *43.4%*	73 *51.0%*	0 *0.0%*	*Total:* 143
3. A learning disability can be expressed as a significant disability in written language.	1 *0.7%*	2 *1.4%*	59 *41.5%*	80 *56.3%*	0 *0.0%*	*Total:* 142
4. A learning disability can be expressed as a significant disability in mathematics.	1 *0.7%*	8 *5.6%*	57 *40.1%*	76 *53.5%*	0 *0.0%*	*Total:* 142
5. A learning disability can be expressed as a significant disability in social skills.	4 *2.8%*	27 *18.9%*	61 *42.7%*	48 *33.6%*	3 *2.1%*	*Total:* 143
6. A learning disability can be expressed as a significant disability in oral language.	1 *0.7%*	10 *7.0%*	63 *44.1%*	69 *48.3%*	0 *0.0%*	*Total:* 143
7. A person with a learning disability can also be identified with another disability.	1 *0.7%*	1 *0.7%*	37 *25.9%*	104 *72.7%*	0 *0.0%*	*Total:* 143
8. A person with a learning disability can also be identified as gifted.	3 *2.1%*	3 *2.1%*	43 *30.1%*	93 *65.0%*	1 *0.7%*	*Total:* 143
9. Fidgeting is a typical characteristic of a student with a learning disability.	15 *10.5%*	69 *48.3%*	44 *30.8%*	7 *4.9%*	8 *5.6%*	*Total:* 143
10. Shouting out is a typical characteristic of a student with a learning disability.	24 *16.9%*	83 *58.5%*	21 *14.8%*	6 *4.2%*	8 *5.6%*	*Total:* 142
11. Hitting is a typical characteristic of a student with a learning disability.	31 *21.7%*	91 *63.6%*	9 *6.3%*	4 *2.8%*	8 *5.6%*	*Total:* 143

Variable	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know	
12. Slower processing speed is a typical characteristic of a student with a learning disability.	5 *3.5%*	24 *16.8%*	83 *58.0%*	31 *21.7%*	0 *0.0%*	*Total:* 143
13. Difficulty comprehending written materials is a typical characteristic of a student with a learning disability.	6 *4.2%*	16 *11.2%*	94 *65.7%*	27 *18.9%*	0 *0.0%*	*Total:* 143
14. Difficulty with sentence structure is a typical characteristic of a student with a learning disability.	7 *4.9%*	33 *23.1%*	85 *59.4%*	16 *11.2%*	2 *1.4%*	*Total:* 143
15. Excellent spelling is a typical characteristic of a student with a learning disability.	29 *20.3%*	95 *66.4%*	9 *6.3%*	3 *2.1%*	7 *4.9%*	*Total:* 143
16. Good ability to express ideas is a typical characteristic of a student with a learning disability.	15 *10.5%*	91 *63.6%*	25 *17.5%*	6 *4.2%*	6 *4.2%*	*Total:* 143
17. Difficulty copying notes from the chalkboard is a typical characteristic of a student with a learning disability.	8 *5.6%*	32 *22.4%*	79 *55.2%*	22 *15.4%*	2 *1.4%*	*Total:* 143
18. Good ability to use phonics is a typical characteristic of a student with a learning disability.	21 *14.7%*	93 *65.0%*	17 *11.9%*	2 *1.4%*	10 *7.0%*	*Total:* 143
19. The severity of a student's learning disability fades with age.	52 *36.4%*	80 *55.9%*	3 *2.1%*	1 *0.7%*	7 *4.9%*	*Total:* 143
20. Atypical human growth is a characteristic of a student with a learning disability.	43 *30.3%*	62 *43.7%*	9 *6.3%*	2 *1.4%*	26 *18.3%*	*Total:* 142

Table 10.1

Frequency Distribution Participants' Responses to Potential Risk factors that can Cause LD

Variable	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know	
21. A family history of learning disability increases the risk of having a learning disability.	1 *0.7%*	13 *9.2%*	91 *64.1%*	30 *21.1%*	7 *4.9%*	*Total:* 142
22. Poor nutrition increases the risk of having a learning disability.	12 *8.6%*	64 *45.7%*	40 *28.6%*	9 *6.4%*	15 *10.7%*	*Total:* 140
23. A history of head injury increases the risk of having a learning disability.	3 *2.1%*	25 *17.6%*	80 *56.3%*	21 *14.8%*	13 *9.2%*	*Total:* 142
24. Child abuse increases the risk of having a learning disability.	7 *4.9%*	45 *31.7%*	54 *38.0%*	15 *10.6%*	21 *14.8%*	*Total:* 142
25. Complications during pregnancy increase the risk of having a learning disability.	2 *1.4%*	15 *10.6%*	81 *57.0%*	23 *16.2%*	21 *14.8%*	*Total:* 142
26. Lead poisoning increases the risk of having a learning disability.	4 *2.8%*	14 *9.9%*	52 *36.6%*	19 *13.4%*	53 *37.3%*	*Total:* 142
27. Lack of parental support increases the risk of a learning disability.	27 *19.0%*	72 *50.7%*	27 *19.0%*	7 *4.9%*	9 *6.3%*	*Total:* 142
28. Infection in the central nervous system increases the risk of having a learning disability.	2 *1.4%*	15 *10.6%*	56 *39.4%*	13 *9.2%*	56 *39.4%*	*Total:* 142
29. Cancer treatment increases the risk of having a learning disability.	11 *7.7%*	44 *30.8%*	28 *19.6%*	6 *4.2%*	54 *37.8%*	*Total:* 143

Variable	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know	
30. Poor parenting style increases the risk of having a learning disability.	33 *23.2%*	71 *50.0%*	22 *15.5%*	6 *4.2%*	10 *7.0%*	*Total:* 142
31. Low child activity level increases the risk of having a learning disability.	18 *12.6%*	72 *50.3%*	27 *18.9%*	4 *2.8%*	22 *15.4%*	*Total:* 143
32. Cultural practices increase the risk of having a learning disability.	38 *26.6%*	83 *58.0%*	9 *6.3%*	2 *1.4%*	11 *7.7%*	*Total:* 143
33. Poor living environment increases the risk of having a learning disability.	19 *13.4%*	67 *47.2%*	35 *24.6%*	7 *4.9%*	14 *9.9%*	*Total:* 142
34. Taking medication increases the risk of having a learning disability.	19 *13.5%*	67 *47.5%*	22 *15.6%*	2 *1.4%*	31 *22.0%*	*Total:* 141
35. Genetic factors increase the risk of having a learning disability.	0 *0.0%*	6 *4.2%*	97 *68.3%*	27 *19.0%*	12 *8.5%*	*Total:* 142
36. Neurological factors increase the risk of having a learning disability.	2 *1.4%*	3 *2.1%*	98 *68.5%*	26 *18.2%*	14 *9.8%*	*Total:* 143

Table 16.1

Frequency Distribution Participants' Responses for Teaching Strategies for Students with a LD

Variable	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know	
37. You need to have an Individual Education Plan before providing modifications and accommodations to students with a learning disability.	28 *19.6%*	68 *47.6%*	32 *22.4%*	14 *9.8%*	1 *0.7%*	*Total:* 143
38. The students need to be formally identified with a learning disability before you can provide them with modifications and accommodations.	48 *33.6%*	70 *49.0%*	19 *13.3%*	4 *2.8%*	2 *1.4%*	*Total:* 143
39. Differentiated instruction is an effective classroom strategy to use for students with a learning disability.	0 *0.0%*	6 *4.2%*	50 *35.2%*	86 *60.6%*	0 *0.0%*	*Total:* 142
40. Direct instruction is an effective classroom strategy to use for students with a learning disability.	6 *4.2%*	25 *17.5%*	65 *45.5%*	41 *28.7%*	6 *4.2%*	*Total:* 143
41. Providing more work is an effective classroom strategy to use for students with a learning disability.	73 *51.0%*	67 *46.9%*	3 *2.1%*	0 *0.0%*	0 *0.0%*	*Total:* 143
42. Breaking lessons down into smaller parts is an effective classroom strategy to use for students with a learning disability.	0 *0.0%*	0 *0.0%*	48 *33.6%*	95 *66.4%*	0 *0.0%*	*Total:* 143
43. Giving a student a computer is an effective classroom strategy to use for students with a learning disability.	2 *1.4%*	17 *12.0%*	84 *59.2%*	36 *25.4%*	3 *2.1%*	*Total:* 142
44. Instructing students to	38	86	10	3	6	*Total:* 143

Variable	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know	
work by themselves is an effective classroom strategy to use for students with a learning disability.	*26.6%*	*60.1%*	*7.0%*	*2.1%*	*4.2%*	
45. An effective classroom strategy for students with a learning disability is to present information orally and not in writing.	20 *14.0%*	46 *32.2%*	62 *43.4%*	8 *5.6%*	7 *4.9%*	*Total:* 143
46. Using graphic organizers is an effective classroom strategy to use for students with a learning disability.	0 *0.0%*	4 *2.8%*	90 *63.4%*	47 *33.1%*	1 *0.7%*	*Total:* 142
47. Medication should be used to reduce the severity of a students' learning disability.	42 *29.4%*	64 *44.8%*	15 *10.5%*	0 *0.0%*	22 *15.4%*	*Total:* 143

Table 22.1

Frequency Distribution Participant Responses Teaching Students with LD

Variable	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know	
48. I understand learning disabilities enough to teach students with this identification.	2 *1.4%*	28 *19.6%*	79 *55.2%*	30 *21.0%*	4 *2.8%*	*Total:* 143
49. I feel well informed about teaching students with a learning disability.	4 *2.8%*	47 *32.9%*	67 *46.9%*	23 *16.1%*	2 *1.4%*	*Total:* 143
50. I feel prepared to teach students with learning disabilities.	1 *0.7%*	40 *28.0%*	76 *53.1%*	22 *15.4%*	4 *2.8%*	*Total:* 143
51. I have adequate resources to teach students with learning disabilities.	11 *7.7%*	71 *49.7%*	43 *30.1%*	15 *10.5%*	3 *2.1%*	*Total:* 143
52. I feel comfortable teaching students identified with a learning disability.	1 *0.7%*	21 *14.7%*	90 *62.9%*	29 *20.3%*	2 *1.4%*	*Total:* 143
53. I need more information on learning disabilities to help teach identified students.	2 *1.4%*	17 *11.9%*	92 *64.3%*	32 *22.4%*	0 *0.0%*	*Total:* 143
54. I am aware of accommodations and modifications to assist students with learning disabilities.	0 *0.0%*	2 *1.4%*	92 *64.3%*	48 *33.6%*	1 *0.7%*	*Total:* 143

Table 28.1

Frequency Distribution Participant's Responses for Support Teachers Receive for Teaching Students with a LD

Variable	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know	
55. I receive support from a consultant or other school board experts to assist me with teaching students with learning disabilities.	11 *7.7%*	40 *28.0%*	63 *44.1%*	24 *16.8%*	5 *3.5%*	*Total:* 143
56. I receive support from my principal or vice-principal to assist me with teaching students with a learning disability.	15 *10.5%*	47 *32.9%*	63 *44.1%*	16 *11.2%*	2 *1.4%*	*Total:* 143
57. I receive support from a resource teacher to assist me with teaching students with a learning disability.	7 *4.9%*	16 *11.2%*	79 *55.2%*	38 *26.6%*	3 *2.1%*	*Total:* 143
58. I receive support from other teachers at my school to assist me with teaching students with a learning disability.	3 *2.1%*	19 *13.3%*	91 *63.6%*	29 *20.3%*	1 *0.7%*	*Total:* 143
59. I receive support from education assistants to assist me with teaching students with a learning disability.	19 *13.3%*	36 *25.2%*	54 *37.8%*	30 *21.0%*	4 *2.8%*	*Total:* 143
60. I receive additional support for teaching students with a learning disability from sources other than those mentioned above (please comment below)	20 *14.2%*	58 *41.1%*	31 *22.0%*	13 *9.2%*	19 *13.5%*	*Total:* 141

Table 31.1

Frequency Distribution of Participants Receiving Support

Variable	Never	Daily	Weekly	Monthly	Once a Term (3 months)	Once a Year	
61. How frequently do you receive support for teaching students with learning disabilities?	22 *15.7%*	26 *18.6%*	54 *38.6%*	21 *15.0%*	12 *8.6%*	5 *3.6%*	*Total:* 140

Table 31.2

Statistical Analysis of Participants Receiving Support

Variable	Mean	Median	Mode
61. How frequently do you receive support for teaching students with learning disabilities?	2.89 *Monthly*	2.00 *Weekly*	2 *Weekly*

Table 31.3

Analysis of Variance for Teachers' Years of Experience and How Often Teachers Receive Support for Teaching Students With a LD

61. How frequently do you receive support for teaching students with learning disabilities?

	Sum of squares	I	Mean square	I	Sig.
Between Groups	26.082	5	5.216	1.904	.098
Within Groups	345.213	126	2.740		
Total	371.295	131			