THE PERSPECTIVES OF OCCUPATIONAL THERAPY STUDENTS AND OCCUPATIONAL THERAPISTS ON THEIR EDUCATIONAL PREPAREDNESS TO PRACTICE WITH CHILDREN WITH NEURODEVELOPMENTAL DISORERS

by

Audrée Robidas Racine

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Abstract

Background/Purpose: There is a small body of literature examining the perceptions of occupational therapy students and graduates regarding their education preparedness for practice worldwide, but specific areas such as pediatrics have received limited attention. This study sought to explore the perceptions of Canadian occupational therapy students and graduates on the topic of their education preparedness to practice with children with neurodevelopmental disorders. **Methods:** Secondary analysis of survey data of 179 Canadian students in occupational therapy and 50 occupational therapists was conducted. **Results:** The students' results confirmed that experience is a predictor influencing their feeling of competency. Results from graduates indicated that collaboration skills related to feelings of competency. **Conclusion:** The outcomes of the present study may assist occupational therapy educational programs in preparing students for entry-level practice in pediatrics and educators in continuing education. The results may have implications for educational programs, occupational therapy practice and research.

List of Abbreviations Used

ACOTRO	Association of Canadian Occupational Therapy Regulatory Organizations
ADDM	Autism and Developmental Disabilities Monitoring
AOTA	American Occupational Therapy Association
ASD	Autism Spectrum Disorders
APA	American Psychiatric Association
Ax	Assessment
CAOT	Canadian Association of Occupational Therapists
CDC	Center for Disease Control and Prevention
DSM-5	Diagnostic and Statistical Manual of Mental Disorders- Fifth Edition
HELP Inc	Health, Education, and Learning Partnerships that promote Social Inclusion
ICD-10	International Statistical Classification of Diseases and Related Health Problems- 10^{th} Edition
ID/DD	Intellectual Disability and Developmental Disability
MIEQ	McGill Inclusive Education Questionnaire
NADSAC	National Epidemiologic Database for the Study of Autism in Canada
ND	Neurodevelopmental Disorders
Tx	Treatment
SPSS	Statistical Package for the Social Sciences
VIF	Variance Inflation Factor
WFOT	World Federation of Occupational Therapists
WHO	World Health Organization

Glossary

Competency: The Oxford dictionaries define the term "competency" as the ability or skill to do something successfully or efficiently (Oxford dictionaries, 2014a). In the context of occupational therapy in Canada, a competency mainly represents the knowledge, skills, and attitudes required for practice of an occupational therapist (ACOTRO, 2012). Furthermore, competencies of Canadian occupational therapists reflect the standards and regulations for practice in a given jurisdiction and are interpreted within the context of each provincial regulatory organization (ACOTRO, 2012). One of the elements of competent practice is capability, the defined as the physical, mental and emotional potential and facility of an individual to fulfill the professional role of the occupational therapist which is often demonstrated through the achievement of the educational credential (ACOTRO, 2012).

Entry-level curriculum: A curriculum comprises a course of study in an educational institution (Oxford dictionaries, 2014b). The term entry-level referring to the moment in which the student enters the profession, thus upon graduation (Nayar et al., 2013). Commonly in Canada, graduates have obtained first an undergraduate degree (usually takes four years of university for completion) and then have gone through an occupational therapy graduate program (generally two years for completion). Since 2008, all occupational therapy education programs accredited have to lead to a professional master's degree in occupational therapy as the entry credential (CAOT, 2014a).

Neurodevelopmental disorders: As defined by the DSM 5,

> the neurodevelopmental disorders are a group of conditions with onset in the developmental period. The disorders typically manifest early in development, often before the child enters grade school, and are characterized by developmental deficits that produce impairments of personal, social, academic, or occupational functioning. The range of developmental deficits varies from very specific limitations of learning or control of executive functions to global impairments of social skills or intelligence (APA, 2013a).

Due to the recent changes of nomenclature of different diagnoses with the arrival of the DSM 5 and in order to unify the classification of diagnoses originally included in the HELPS Inc study, the current document used the definition above and accepted the followed diagnoses as part of neurodevelopmental disorders: Autism Spectrum Disorders, Down syndrome, Fragile X syndrome, Tourette syndrome, Fetal alcohol syndrome, epilepsy, non-specific intellectual disability, developmental delay, physical disabilities (e.g. cerebral palsy) and hearing and/or visual difficulty.

Preparedness: Generally, the term means the "state of readiness" (Oxford dictionaries, 2014d). In the context of occupational therapy students and graduates, several components or factors can be comprised in the concept. For this thesis, the operational definition will limit the factors to the knowledge of assessment/treatment and experience of both students and graduates as well as the previous qualifications of students.

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"Live as if you were to die tomorrow. Learn as if you were to live forever."
- Mahatma Gandhi

My heart is thankful to the greatest woman in my life who has instilled in me her passion for education and life-long learning. This is a gift that will consume me for a lifetime. This passion drives me days after days into new challenges and was the impetus for the completion of this Masters and the writing of this manuscript.

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Chapter 1 Introduction

In the last decade, international organizations have deployed efforts to develop guidelines in order to improve the health care system for the benefit of people with disabilities (World Health Organization [WHO], 2000; WHO, 2011). In 2012, the WHO recognized the increasing prevalence of children with neurodevelopmental disorders worldwide and identified ten research priorities (WHO, 2012). Building workforce capacity is one of these priorities (WHO, 2012). Health care professionals must be able and prepared to respond to the additional needs of young people with disabilities. The well-being of these young people is reliant on the knowledge, skills, attitudes and commitment of health care professionals (WHO, 2010a). The profession of occupational therapy in Canada has provided services to children with disabilities for many decades (Villeneuve & Hutchinson, 2012). More specifically, according to the Canadian Association of Occupational Therapists (CAOT), 23% of occupational therapists who are CAOT members are working exclusively with children (CAOT, 2011). To ensure pediatric occupational therapists are accountable and ready to accomplish their mandate, they must receive rigorous preparation.

Entry-to-practice occupational therapy curricula represent a core pillar for academic institutions. The goal of such curricula is to prepare competent entry-level occupational therapists. Many factors need to be taken into account to ensure the quality of educational programs (Prideaux, 2003). Surprisingly, the literature is not eloquent about Canadian occupational therapy students' and occupational therapists' perspectives on education preparedness to work with children with neurodevelopmental disorders (ND).

This study originated from a larger Canadian research project describing **H**ealth, **E**ducation, and **L**earning **P**artnerships that promote **S**ocial **Inc**lusion (HELPS Inc) of children with intellectual disabilities and developmental disabilities (ID/DD) as they transition into school. For the present study, a secondary analysis of survey data of 179 students in occupational therapy of two Canadian universities and 50 graduate Canadian occupational therapists was undertaken to explore their perceptions of educational preparation to work with children with ND. More specifically, the main research question examined was: *How do Canadian occupational therapy students and occupational therapists perceive their level of preparedness provided by entry-level curricula to work with children with ND?* Subsequently, the following questions were developed to answer the main research question:

1. What is the relationship between the experience (work/volunteer or clinical) of participants and perceived level of competency in meeting the needs of children with neurodevelopmental disorders?
2. What is the relationship between the knowledge of assessment/diagnosis and treatment reported by participants and their perceived level of competency?
3. What is the relationship between the education background of students and their perceived level of competency?

This study offered an opportunity for both students and clinicians in the profession of occupational therapy to express their perceptions about their preparation to work with children with ND. The research findings have implications for several stakeholders, such as researchers, educators and future members of the profession. It is anticipated that these findings may be an impetus for further dialogue. This study provides findings that may

prompt discussion between educational institutions, students and practicing professionals to enhance entry-to-practice occupational therapy curricula. Such discussions have the potential to affect the day-to-day practice by equipping occupational therapists to face the ever changing and complex realities of practice and in turn enhance the health of children with neurodevelopmental disabilities.

The next chapter will describe the study population and the varied contexts of curriculum development that impact student and practitioner preparedness. It will also highlight the challenges faced by educational institutions as well as the gaps present in the research literature. Chapter 3 will describe the details of the methods used for this research project followed by Chapter 4, where the findings will be presented. Finally, Chapter 5 will discuss and draw conclusions from the findings and will identify limitations of the study and its implications for education and the profession of occupational therapy.

Chapter 2 Literature Review

Occupational therapy has wide diversity in terms of its scope of practice (Nayar, Gray, & Blijlevens, 2013). In Canada, 23% of occupational therapists work exclusively with children and their families (CAOT, 2011). Occupational therapists work with children in a variety of settings such as community-based clinics, pediatric rehabilitation centres, private practice, general hospitals or school boards (Brown, Rodger, Brown, & Roever, 2005). The diversity of these practice settings allows occupational therapists to a) enable the engagement and participation of children with disabilities, and b) appraise all aspects of their lives in the context of occupation (Brown, Rodger, Brown, & Roever, 2007). In order to provide safe, ethical and effective services to children, occupational therapists and occupational therapy students expect university curricula to prepare them to become competent entry-to practice clinicians in the pediatric area (Hodgetts et al., 2007; Nayar et al., 2013). An essential element of an educational curriculum is the evaluation process, which can include students' evaluation of program design or delivery, as it positively contributes to the academic development of the institution as well as its members (Morrison, 2003). According to Prideaux (2003), a curriculum exists at three levels: "what is planned for the students, what is delivered to the students, and what the students experience" (p.268). Thus, evaluating the students' experience is an important aspect to consider when improving curriculum development (Morrison, 2003).

There is an emergent body of literature analyzing the overall perceptions of occupational therapy students and graduate occupational therapists in relation to their education and preparedness for practice (Brockwell, Wielandt, & Clark, 2009; Gray et al., 2012; Nayar et al., 2013; Hodgetts et al., 2007). However, sparse research exists about

how students and therapists feel about their educational preparation to work with children with ND. The purpose of this literature review is to first present neurodevelopmental disorders as well as the challenges that come with them. Next, a global portrait of the international and national guidelines underpinning occupational therapy curricula will be drawn in order to establish the current context and practice in Canada. Finally, the need for further research investigating the experience of students and occupational therapists with regards to their education preparedness for practice with children with ND will be articulated.

A literature search was conducted using the Cumulative Index to Nursing and Allied Health Literature (CINAHL) and PubMed databases. To identify literature that may not have been catalogued in the databases used, other searches were conducted through the Internet and Google Scholar. The main keywords used were: occupational therapy competency, experience, intellectual disabilities, preparation for practice, occupational therapy curriculum, pediatric occupational therapy, occupational therapy education, curriculum, curriculum preparedness, participation, neurodevelopmental disorders, inclusion, Down syndrome, autism spectrum disorder and cerebral palsy. The search was initially limited to the articles published between 2007 and 2014, to get the most recent and accurate information. When no relevant articles were found on the specific searched topic, the search was extended back to 2000. The abstracts of the identified articles were scanned and the most relevant articles were read in their entirety. Reference lists from the selected articles yielded additional relevant articles, which were usually older. A total of 100 relevant articles were thoroughly examined as the basis of this literature review.

Neurodevelopmental Disorders: Understanding the Challenges

Education programs must consider population-based evidence when developing a curricular content in order to determine which types of disability in the population are likely to be encountered by occupational therapists in practice. Consideration of what occupational therapy can offer to these populations to address their needs is also important. Prevalence rates of diagnoses can support and orient the priorities that need to be inserted into a curriculum. They can serve as a mean to understand and evaluate which populations may deserve more attention as they will likely be more frequently encountered in occupational therapy services. In Canada, Miller et al. (2013) showed that about 4.5% of Canadian children aged 5-14 years can be considered as having a disability based on demographic data from the Canadian 2006 census, and within this number, 73.5% met the criteria for neurodevelopmental disorders and disabilities. Recognizing that about three quarters of children between 5-14 years with disabilities in Canada have neurodevelopmental disabilities reinforces the importance and relevance of ongoing efforts to meet the needs of this population whether it is from a clinical, research or educational stance (Miller, Mâsse, Shen, Schiariti, & Roxborough, 2013). Neurodevelopmental disorders manifest in early childhood and are characterized by developmental deficits that may affect personal, social, academic, or occupational functioning (American Psychiatric Association [APA], 2013a). Occupational therapists are well positioned to provide a holistic vision of clients and support their occupational needs. Essential information about neurodevelopmental disorders should be covered in education curricula as occupational therapists can enhance many of the affected areas of children with these disorders. The prevalence rates in addition to the multifaceted needs

of this pediatric group reinforce the necessity for educators to ensure its recognition in occupational therapy educational content. The next section will examine some challenges faced by researchers, which can also become problematic for education programs, and then difficulties faced by children with ND and occupational therapy practitioners. It will first present the recent changes and challenges of using the neurodevelopmental disorders nomenclature in the literature. Then, some examples of the most important diagnoses included in neurodevelopmental disorders and broadly seen in pediatric occupational therapy practice will be depicted as well as the focal roles of occupational therapists with these client groups. These examples present some of the realities of clinicians, which reinforce the importance of understanding the implications of these disorders to enhance the preparation of students.

The nomenclature challenge. The nomenclature "neurodevelopmental disorders" is subject to a great deal of variability in the literature (Miller et al., 2013). The lack of common understanding of terminology and the different perceptions of developmental disabilities are a source of concern contributing to a general confusion (Miller et al., 2013). Two dominant diagnostic classification systems coexist for mental and behavior disorders: the *Diagnostic and Statistical Manual of Mental Disorders- Fifth Edition* (DSM-5) produced by the American Psychiatric Association and *the International Statistical Classification of Diseases and Related Health Problems- 10th Edition* (ICD-10) published by the WHO (Baird, 2013). The latest edition of the DSM was released in 2013 (APA, 2013a) and a revision of the ICD with the intention of harmonizing both systems is underway and expected for 2017 (WHO, 2014). The recent shift to the DSM-5 comes with fundamental reform of the diagnostic classification of complex

neurodevelopmental disorders (The Lancet Neurology, 2013). Indeed, one important change included in the DSM-5 is the creation of the Neurodevelopmental Disorders section (Harris, 2014). The DSM-5 stipulates that under the umbrella of neurodevelopmental disorders with onset in the developmental period stand seven subgroups including intellectual disabilities (including global developmental delay), communications disorders, autism spectrum disorder, attention-deficit/hyperactivity disorder, specific learning disorder, motor disorders and other neurodevelopmental disorders (APA, 2013a; Harris, 2014). Clearly, this encompasses a broad range of disabilities for children. It is important to note that researchers may encounter several challenges when investigating this population due to the large variability in the nomenclature used to refer to children with ND (Miller et al., 2013). This challenge can also potentially transfer to educators and curricula content in occupational therapy. Acknowledging this limitation is relevant for educators. Regardless of the current limitations of both diagnostic systems, the classification provides a view of the strengths and needs of children with neurodevelopmental disorders in order to establish appropriate assessments and interventions and the necessary support to allow their full participation in society. For this paper, the term neurodevelopmental disorders will refer to the operational definition based on the DSM-5 outlined in the glossary of this manuscript.

Select neurodevelopmental conditions and their challenges. The following paragraphs draw examples of challenges underpinning some neurodevelopmental conditions of children. Several reasons motivated the choice of these three conditions. First, these disorders are among the most common type of disabilities among young children in Canada (Government of Canada, 2006). Additionally, they are frequent in

occupational therapy services and co-occur with a great variety of diagnoses in practice, yet necessitate very different skills from an occupational therapist' perspective due to the nature of the disabilities that can be experienced by the child. Furthermore, the use of occupational therapy services by these clients, the roles of occupational therapists as well as the success of occupational therapy interventions with these clients is documented, to different extents, in the literature for the three disorders selected. Providing examples of diagnoses from heterogeneous nature offers an opportunity to explore the wide array of possibilities for occupational therapists and also show the challenges for educators to prepare students to work with such a large and complex client group, while underlining its value in pediatric curricular content.

Down syndrome. In Europe and the United States, Down syndrome, a chromosomal condition, is the most common genetic cause of intellectual disability affecting growth, development and participation in activities of daily living (Geelhoed, Bebbington, Bower, Deshpande, & Leonard, 2011; WHO, 2010b). This genetic disorder was described in 1866 by an English physician called John Langdon Down and in 95% of cases, this pathology is due to an extra chromosome 21 (Geelhoed et al., 2011). Currently, the condition occurs approximately 1 per 1000 live births in developed countries (Geelhoed et al., 2011). In the United States, a recent study conducted by Shin et al. (2009), indicated that the prevalence of Down syndrome at birth increased by 31.1% between 1979 and 2002. Geelhoed et al. (2011) found that the total health care cost for children with Down syndrome is four times higher than the population mean in young children and 1.7 times higher by the end of adolescence. Acknowledging the improved life expectancy and the advancement in pre and neonatal interventions, health care practitioners must

expect that health and quality of life needs for individuals with Down syndrome will likely continue to grow (Geelhoed et al., 2011). The behavioural phenotype of Down syndrome is relatively well characterized. The difficulties associated with this condition are located in various areas of development, which include motor functioning, cognitive, language, social and emotional functioning (Daunhauer & Fidler, 2011). For instance, the majority of individuals with Down syndrome have characterized physical features such as hypotonia, musculoskeletal hyperflexibility, short stature, or dysplastic ears (Daunhauer & Fidler, 2011). In fact, the delay of motor milestone acquisition in this population led Palisano et al. (2001) to develop a curve specifically designed for people with Down syndrome so health care providers can determine if the motor skills acquisition of an individual is at the expected rate for this genetic syndrome. Down syndrome is also associated with a distinctive neuroanatomical profile such as delays in myelination as well as a reduction in hippocampus, prefrontal cortex and cerebellum (Daunhauer & Fidler, 2011). Additionally, people affected by the syndrome have an increased risk of developing concurrent health conditions (McGrath, Stransky, Cooley, & Moeschler, 2011). These can include specific medical conditions such as congenital heart disease, but also other diagnoses including depression, attention deficit disorder or autism spectrum disorder (Daunhauer & Fidler, 2011; McGrath et al., 2011). The evidence to date shows that individuals with this syndrome appear to have relative strengths in visual-perceptual skills, receptive language, and core social relatedness (Daunhauer & Fidler, 2011). On another hand, many individuals experience challenges, including a cognitively avoidant learning style and a tendency to avoid more complex tasks by using their social

strengths (Daunhauer & Fidler, 2011). Unfortunately, those challenges can lead to missed opportunities and influence their development (Daunhauer & Fidler, 2011).

Occupational therapy practitioners work with people with Down syndrome to help them master skills for independence such as self-care skills, fine and gross motor skills and play skills (American Occupational Therapy Association [AOTA], 2015). Occupational therapy can enable people with Down syndrome to reach their full potential throughout lifetime (AOTA, 2015). For instance, during infancy, occupational therapy interventions can help oral-motor feeding problems due to weak muscle tone (AOTA, 2015). Focusing on improving physical functions can be beneficial for fine motor development to enhance handwriting, scissors skills and self-care skills independence like using a zipper later on at school. Occupational therapists may also assist individuals with Down syndrome with adaptations in the classroom such as the position of desks and chairs, but also assist children to complete multistep tasks to facilitate their participation in school activities (AOTA, 2015). The literature also suggests using anticipatory guidance by occupational therapists to create activities that encourage exploration and cause-and-effect play during childhood to minimize the difficulties with goal-directed actions, a challenge often present in Down syndrome (Daunhauer & Fidler, 2011). Many research topics still need further examination from an occupational therapy's standpoint, but Daunhauer and Fidler (2011) argue that acknowledging the phenotypic information about Down syndrome can guide occupational therapists in developing adequate intervention for this clientele. Although occupations of individuals with Down syndrome may be affected differently considering the range of severity of symptoms, it is of relevance for occupational therapists to recognize the relative strengths and challenges

associated with this syndrome (Daunhauer & Fidler, 2011). With their training in child development, neurology, musculoskeletal conditions and their capacity to analyze and adapt daily occupations to a person and the environment, occupational therapists are well equipped to play a variety of roles for individuals with Down syndrome and their families. Furthermore, the severity of the condition (McGrath et al., 2011), the increasing prevalence of this syndrome over the last 20 years (Shin et al., 2009) and the high economic cost of health care for this group should also stress the importance for authorities to advocate for higher quality of care for this population and develop effective occupational therapy interventions (Daunhauer & Fidler, 2011). This effort should be endorsed by educational institutions to support and encourage the professional currency of occupational therapists working with children affected by Down syndrome.

Autism spectrum disorders. Autism spectrum disorders (ASD) are a group of neurodevelopmental disabilities characterized by impairments in social interaction and communication as well as a restrictive range of interests or repetitive patterns of behaviors (APA, 2013b). The new edition of the DSM also includes the sensory hypo-sensitivity or hyper-sensitivity as a criterion (APA, 2013a). In addition to the core impairments, children with ASD are at higher risk of developing mental health problems due to difficulty finding adaptive solutions to life's challenges, and higher rates of stressful life events such as abuse and to predisposition for particular types of mental health or concurrent diagnoses (First Leadership Limited, 2008). Since the last decade, this group has become an important public health concern and the latest prevalence rate in 2010 is 1 in 68 children in the United States (Center for Disease Control and Prevention [CDC], 2014). Between 1997 and 2008, a gigantic increase of 289.5% in the prevalence

rate in the United States was reported by Boyle et al. (2011)'s study. The new estimate of 2010 represents a jump of 30 per cent since the last calculation in 2008. Similar increases are found in Canada (National Epidemiologic Database for the Study of Autism in Canada [NADSAC], 2012). This information illustrates the dramatic increase in the number of individuals with ASD over the last decade (AOTA, 2010).

In the United States, occupational therapists are frequently utilized as health care providers for individuals with ASD, second only to speech-language therapists (AOTA, 2010; Interactive Autism Network, 2009). James, Pizur-Barnekow & Schefkind (2014) emphasize that occupational therapy holds a key role in the service delivery for children with ASD in the literature. In 2015, CAOT released a new position statement regarding the various roles and recommendations for occupational therapists as well as the initiatives taken by CAOT to support occupational therapists with this clientele. The statement stipulates that occupational therapists have the ability to assess an individual's occupational performance and to provide intervention to facilitate independence and participation in meaningful activities throughout lifespan. Given the combination of sensory, motor, communication, social and behavioral challenges faced by individuals with ASD, which can potentially affect several areas of occupational performance across all environments, CAOT supports that with their knowledge in neurobiology, occupational therapists are well positioned to assist people with autism. For paediatric occupational therapists, the goal is to support health and participation of people living with autism though engagement in meaningful childhood occupations (AOTA, 2010). Given the number of children affected by autism spectrum disorder and the crucial roles occupational therapy can hold for this population, it is encouraging that 89% of Canadian

occupational therapy curricula teach about this disorder (Rodger et al., 2006). Indeed, students and occupational therapists must be well prepared to intervene with this relatively large population. Some initiatives are starting to emerge from Canadian institutions to support education programs. The recent position statement produced by CAOT promotes the inclusion of evidence-informed theory and practice within university curricula to ensure that graduates are qualified to address the needs of individuals with ASD (CAOT, 2015).

Cerebral palsy. Cerebral palsy is defined as a "group of non-progressive, but often changing, motor impairment syndrome secondary to lesions or abnormalities of the brain arising at any time during brain development" (First Leadership Limited, 2008, p.12). The overall prevalence in Canada is estimated to be 2.11 per 1000 live births (Oskoui, Coutinho, Dykeman, Jetté, & Pringsheim, 2013). According to Oskoui et al. (2013), this prevalence estimate has remained constant despite the addition of new data and the increased survival of infants at high-risk pregnancies. Some of the main motor impairments are paresis, involuntary movement or poor coordination (First Leadership Limited, 2008). Most children with this motor disorder have intelligence within normal range, but some also have developmental/intellectual disability (First Leadership Limited, 2008). The range of skills of children with cerebral palsy can vary widely (First Leadership Limited, 2008). Therefore, frequency and duration of occupational therapy services in Canada vary according to the characteristics and needs of children and the practice setting (Mazer, Feldman, Majnemer, Gosselin, & Kehayia, 2006). In the Palisano et al. 2012 study, results showed that 20.1% of children with cerebral palsy are receiving occupational therapy services in education settings and 55.2% of children are

receiving intervention in clinical settings in Canada. Children receiving services in both settings simultaneously represent 15.7% of the clientele (Palisano et al., 2012). Over the past decade, the evidence related to cerebral palsy intervention has increased at an exponential rate, which has helped expand the knowledge of newer, safer and more effective interventions (Novak et al., 2013). A recent systematic review compiled and analyzed effective interventions for people with cerebral palsy (Novak et al., 2013). Among those listed in the review, some are particularly relevant to occupational therapy. For instance, occupational therapy interventions following botulinum toxin injection, home programs for improving motor activity performance/self-care and pressure care such as sitting and positioning for reducing the risk of pressure ulcers are seen as best-practice interventions for children with cerebral palsy (Novak et al., 2013). Occupational therapists can intervene directly on primary and/or secondary impairment of body function and structures such as spasticity, muscle performance, range of motion, balance, and physical endurance (Palisano et al., 2012). Moreover, occupational therapists can have an active role to enable activities such as mobility, transfers, self-care and participation/engagement in social interactions with peers and adults, play and recreational activities in the community (Palisano et al., 2012). Rodger et al. (2006)'s study highlighted that all Canadian occupational therapy programs teach cerebral palsy in their curriculum. Given that information about this condition is taught across Canada, it is of relevance to investigate the level of preparedness perceived by occupational therapy students and occupational therapists to work with this diagnostic group to see if the content of curricula ties in with their needs and expectations.

Neurodevelopmental disorders are highly present in the population and in occupational therapy services. Undeniably, this population comes with unique challenges. Understanding the nature of neurodevelopmental disorders as well as the roles held by occupational therapy practitioners are of relevance for education committees in order to help them develop curricular content in pediatrics. However, beyond the comprehension of specific client groups for curriculum developers, the process of curriculum development is multifaceted and embedded within a larger context. Countries are influenced by global trends and movements to generate excellence in education programs. The following section will illustrate some of the international and national contexts predisposing the development of occupational therapy curricula in Canada.

Multilevel Context of Curriculum Development

Several factors influence the context of curriculum development in occupational therapy. A funnel process starting from international and moving to local influences underpins decisions to sustain the currency and development of the profession. International priorities affect the course of national decisions in order to develop high quality standards and competencies in occupational therapy. The next section will depict the current research priorities of the WHO, then will tackle the occupational therapy organizations guiding the profession and finally will present the current occupational therapy education system and practice in Canada. This will serve as a preamble to establish an overview of the current context and its relevance for the purpose of the present research.

World Health Organization priorities. Developing competent health care providers through educational programs is of interest to several stakeholders, including regulatory associations, educators, the community and international agencies (Gray et al., 2012). Importantly, this stance should be adopted from an international level to ensure better outcomes worldwide as it will influence and affect local development. International guidelines serve as support for countries. Although not mandatory, Canada can use international guidelines to align the development and education of health professionals. In 2000, the *World Health Report* produced by the World Health Organization (WHO) outlined four key functions of health care systems. One of them is generating the human resources to make services delivery accessible and inclusive for all individuals, including children with disabilities (WHO, 2010a). A decade later, in 2011, the WHO published the *World Report on Disability*, a landmark publication suggesting steps for all stakeholders, from governments to disabled people's organizations, with regards to people with disability. Rehabilitation services hold an important position in this report. In fact, a full section of the report is dedicated to the research needs and priorities of rehabilitation services. Among other aspects, the development of rehabilitation services for people with disabilities as well as the recognition that curricula for rehabilitation professionals should include content on the social, political, cultural, and economic factors influencing the health and quality of life of persons with disabilities are highlighted (WHO, 2011). The WHO also reported that interdisciplinary team training develops collaboration, improves rehabilitation implementation, and increases client participation and satisfaction (WHO, 2011).

Pursuing the enormous work initiated with the *World Report on Disability* and acknowledging the increasing prevalence of children with neurodevelopmental disabilities worldwide, the WHO identified ten research priorities in 2012 (WHO, 2012). Building workforce capacity is one of these priorities (WHO, 2012). Despite the numerous challenges that come into play to build and maintain a quality workforce, the WHO emphasizes educational curricula (WHO, 2010a). Unfortunately, curricula content is not uniform across countries and has gaps regarding education around specific diagnoses (Pomona Project, 2008; WHO, 2007). Several publications enlighten these challenges. For instance, a recent study produced by the WHO (2007) shows that many countries include too little or no information about intellectual disabilities, one of the subtypes of ND, in undergraduate and graduate programs. Health care professionals must be able and prepared to respond to the additional needs of young people with disabilities as the well-being of this population is reliant on the knowledge, skills, attitudes and commitment of health care professionals (WHO, 2010a). The WHO states that developing training curricula should incorporate competencies representing universal set of values and skills, but also role-specific components individualized for the different health professions (WHO, 2010a). The WHO documents outline some of the core components that should likely be included in training curricula (examples: understanding the diagnoses, knowledge of basic child development and developmental milestones, strategies for communicating and empowering children and managing challenging behaviors). The organization remains rather vague on what should constitute the specific role components for rehabilitation practitioners, but highlights that these are nonetheless

essential and should be included in initial education, in-service training and life-long learning (WHO, 2010a; WHO, 2011).

Many challenging situations for people with disabilities exist worldwide. The WHO and other organizations have released numbers of important publications over the last decade to support the building of quality workforce and educational training for rehabilitation services. This effort aims to enhance health care for children living with neurodevelopmental disabilities. Ideally, the core values portrayed in these milestone publications should be interwoven throughout all components of training curricula (WHO, 2010a). These international priorities set the tone for national authorities and can help guide occupational therapy organizations to improve professional accountability. Furthermore, these guidelines can provide justification for future research.

World Federation of Occupational Therapists. The World Federation of Occupational Therapists (WFOT) is the official representative of occupational therapy and occupational therapists internationally. WFOT was founded in 1952 and admitted into official relations with the WHO in 1959 (WFOT, 2012b). It is the responsibility of the WFOT to identify an entry-level competencies framework for the practice of occupational therapy to inform and guide the different stakeholders of the profession's competencies (WFOT, 2008).

One of the WFOT priorities is to ensure an ongoing development of quality education and research in occupational therapy worldwide (WFOT, 2008). The WFOT has published the *Revised Minimum Standards for the Education of Occupational Therapists* (2002) as well as the *Entry-Level Competencies for Occupational Therapists* (2008) to reflect the common value of the profession. These documents can serve as overarching

guide for WFOT member countries, but do not replace the country-specific documents (WFOT, 2008). The WFOT suggests that member countries with existing entry-level competency standards should review their documents to ensure that the competencies are congruent with the WFOT requirements (WFOT, 2008). Countries should use the prescribed guidelines as guidance to develop and monitor practice competencies (WFOT, 2008). However, regardless of the scope of practice of occupational therapists, the organization recognizes that the essential requirements to practice in a competent manner have to be consistent with the local practice (WFOT, 2012a). Moreover, the organization recommends that competencies should be defined through collaboration among occupational therapy practitioners, educators, member associations and society (WFOT, 2012a).

Additionally, the WFOT unequivocally supports and acknowledges the relevance of the *World Report on Disability* (2011) (WFOT, 2011). The WFOT (2011) noted that "The *World Report on Disability* is a monumental achievement of pairing a comprehensive and global picture of the disability experience and human rights as a fundamental part of everyday life for persons with disabilities globally" (p.1). The WFOT also stressed the magnitude of its impact for entry-level occupational therapy programs (WFOT, 2011). Therefore, it seems that several efforts from the World Federation of Occupational Therapists support the directions of the WHO with respect to the development of occupational therapy programs worldwide. This impetus reflects dialogue and collaboration between the different international and national occupational therapy stakeholders, to fulfill the needs of children with ND in a satisfactory and effective manner.

Occupational therapy authorities in Canada. Distinct authorities are supporting the profession of occupational therapy in Canada. Primarily, the profession of occupational therapy is regulated by provincial and territorial regulatory bodies. The Association of Canadian Occupational Therapy Regulatory Organizations (ACOTRO) is a national organization that promotes collaboration and communication between these bodies. ACOTRO ensures that anyone with the title "occupational therapist" is qualified and protects the public by ensuring that occupational therapists are competent to practice. Additionally, the Canadian Association of Occupational Therapists (CAOT) constitutes an important entity for occupational therapists in Canada. CAOT is an organization assisting occupational therapists to achieve excellence in their professional practice and promoting occupational therapy in Canada and internationally whereas the provincial regulatory bodies have the mandate to protect the public and regulate the profession (ACOTRO, 2012; CAOT, 2014b). CAOT recognizes that the workforce in occupational therapy must be well qualified and established national standards for education in 1975 (Townsend & Polatajko, 2007). An Academic Accreditation Council was created in 1985 (Townsend & Polatajko, 2007). All entry-level occupational therapy programs in Canada have to be accredited by CAOT (Townsend & Polatajko, 2007). National academic accreditation standards set by CAOT are congruent with, and exceed, the minimum international standards for education as established by the WFOT (Townsend & Polatajko, 2007; WFOT, 2002; WFOT, 2008). Academic programs must demonstrate that graduates have been educated in the competency areas of the *Profile of Practice of Occupational Therapists in Canada* (CAOT, 2012) (Appendix A) and the *Essential Competencies of Practice for Occupational Therapists in Canada* (ACOTRO, 2012)

(Appendix B). These documents highlight the core competencies occupational therapists should have in order to provide safe, ethical and effective services (ACOTRO, 2012; CAOT, 2012).

Those requirements can serve as a foundation for entry into the profession as well as for evaluating the Canadian occupational therapy curricula (Merritt, Blake, McIntyre, & Packer, 2012). Surprisingly, research by Canadian occupational therapy programs in this arena is not abundant (Merritt et al., 2012). Indeed, it appears that Merritt et al. (2012)'s study was the first one examining the alignment between the planned occupational therapy curriculum of one Canadian university to the essential competencies described by ACOTRO. Even though findings showed an overall concordance between the planned curriculum and the regulatory requirements, it is recognized that the occupational therapy literature has not yet formally evaluated or discussed the relative weighting of content in curricula (Merritt et al., 2012). In other words, no evidence supports its management. According to Merritt et al. (2012), the influence of the actual proportion of educational content curricula on the quality of occupational therapy programs is not well known. This can have potentially significant repercussions on occupational therapy students and occupational therapists aiming to work in the pediatric field as this area may be underrepresented or may receive unbalanced attention in content of curricula among the different Canadian universities. Further, even if academic programs are based on the *Profile of Practice of Occupational Therapists in Canada* and the *Essential Competencies of Practice for Occupational Therapists in Canada*, they will not necessarily contain a predetermined proportion of content in practice areas such as pediatrics because these documents focus on skills that are relevant across practice areas. There is in fact no

requirement for curricula to incorporate proportions of content based on client age groups or specific health conditions. Merritt et al. (2012) recognize the need of research to investigate the experienced curricula by students and the need for research to elucidate the potential gaps between the planned and the experienced curricula to inform changes and the development of academic programs.

University program curricula in Canada. In Canada, occupational therapists are trained through one of the fourteen occupational therapy programs. These programs are accredited by the Canadian Association of Occupational Therapists, to ensure quality of standards (CAOT, 2014a). Since 2008, CAOT accredits only educational programs that lead to a master's degree in occupational therapy as the entry credential (CAOT, 2014a). Prior to this date, a bachelor's degree was the requirement for entry-level occupational therapy in Canada (CAOT, 2014a).

Following the required standards, Canadian universities must develop high quality curricula for the profession as educating students with the fundamental theoretical and clinical skills basis for practice through curricula is the ultimate objective for educational institutions (Rodger, Brown, Brown, & Roever, 2006). The way universities teach occupational therapy students core skills for practice is critical as it influences which frames of reference they will internalise, their decision process and their clinical decisions (Rodger et al., 2006). Moreover, it creates the foundation for future learning and practice and therefore, students should be exposed to a wide array of theory, interventions and assessment to inform their practice (Rodger et al., 2006). In general, a curriculum is the reflection of set of values and educational ideas in practice and represents therefore the product of human agency (Prideaux, 2003). Individuals who are responsible for curricula

development should be open to curricular critique and responsive to changes in values and expectations to remain relevant (Prideaux, 2003). According to Prideaux (2003)'s article, a curriculum exists at three levels: planning, delivery and students' experience. Therefore, exploring the perspective of students constitutes an imperative component to enhance curriculum.

Despite the paucity of literature investigating the occupational therapy curriculum from students' perspective, some research has explored the planned pediatric occupational therapy curricula in different countries (Rodger et al., 2006). For example, in 2006, when compared to other countries such as Australia/New Zealand, the proportion of pediatric content in the Canadian occupational therapy curriculum was lower (Rodger et al., 2006). Indeed, 12.6% of paediatric content composed the total Canadian curriculum in comparison to 20% for the Australian/New Zealand curriculum (Rodger et al., 2006). This Canadian statistic show the limited amount of pediatric information taught at under graduate and graduate levels despite the 23% of occupational therapists working with children as calculated by CAOT (CAOT, 2011; Rodger et al., 2006).

To guarantee adequate preparation of pediatric occupational therapists, one strategy used by universities is to continually integrate and modify curriculum content and core skills (Jirikowic et al., 2001; Prideaux, 2003). Commonly, a curriculum has at least four main components: content, teaching and learning strategies, assessment process and finally an evaluation process (Prideaux, 2003). Specifically, the evaluation process can cover any aspects of the education process and the outcomes measures should show the impact of the curriculum on the "knowledge, skills, attitudes, and behaviours of students" (Morrison, 2003, p.385). Furthermore, Morrison (2003) argues that students can be a

reliable and valid source of information when addressing curriculum evaluation. Consequently, examining the experience of students and increasing research related to curriculum content are warranted to improve the development as well as the quality of occupational therapy programs across Canada. Ultimately, this endeavour may create opportunities to expand pediatric course content in curriculum to enhance the abilities of occupational therapists to serve children with special needs and their families (Jirikowic et al., 2001). Increasing the pediatric content may be necessary regardless of whether or not students intend to practice in this field as generalist practitioners must be prepared to perform services throughout the lifespan (Jirikowic et al., 2001).

Pediatric occupational therapy practice in Canada: The workforce. This section will address an important factor for the occupational therapy practice in Canada: the workforce. For the survival of the profession, occupational therapy authorities must deploy effort to build an adequate workforce regardless the field of practice of its clinicians. Acknowledging the needs of the workforce provides leverage for universities to enhance educational program**.** As occupational therapy offers a unique and valued contribution to Canadians' health and well-being, building workforce capacity and quality training for the profession are essential to cope with the population needs, to attain a culture of professional scholarship as well as accountability (CAOT, 2010). An important source of occupational therapy workforce in Canada is the Canadian graduates of occupational therapy university programs (Townsend & Polatajko, 2007). Over the last decade, a rise of graduate occupational therapists from education programs has been observed (CAOT, 2012; Townsend & Polatajko, 2007). Indeed, occupational therapy services are provided by practitioners with an average range of 39 years of age, which is

younger than other peer health professions such as medicine and nursing (CAOT, 2012). This younger age profile also reflects the growth of the profession (CAOT, 2012; Townsend & Polatajko, 2007). This growth has been triggered by the great changes in the practice context over the last three decades due to reforms in primary health care (Villeneuve & Hutchinson, 2012). As a result, an expansion of services offered in occupational therapy has occurred, which has broadened the variety of clients, especially in pediatrics (CAOT, 2012; Villeneuve & Hutchinson, 2012). In 2006, information collected from the voluntary membership of CAOT showed that 19.4% of participants were working with pre-school children (0-5 years), 29.0% of occupational therapists worked with school children (6-12 years) and 30.3% of all respondents offered services to adolescents (13-18 years) across Canada. Moreover, in 2011, CAOT membership statistics indicate that 23% of occupational therapy practitioners are working exclusively with children (CAOT, 2011). These numbers reflect the importance of the pediatric population in the occupational therapists' workload.

With the constant growth of the profession, the occupational therapy workforce necessitates constant analysis and planning in order to maintain high quality services. A variety of strategies are necessary for successful workforce planning and quality education programs. In Canada, the ratio of occupational therapists per capita lags behind many countries with similar health systems such as Denmark or Sweden (WFOT, 2010). However, strategies to analyze the Canadian occupational therapy workforce have been developed. For instance, the creation of a database of information regarding the supply and utilization of occupational therapists to enhance the workforce demands has been put in place (CAOT, 2010). The data collected with this tool can be of significant importance

for educational curricula to adjust to the occupational therapists' needs and to guide the weighting of curricula content regarding the different competencies. Another example of strategy used in Canada to enhance the workforce is the recent change from bachelor's degree to master's degree in the entry-level education programs in Canada (CAOT, 2010). This advancement in the occupational therapy education system undergirds the profession by maintaining and developing its notoriety and professional status among the other allied health professions, responding to the growing emphasis on research, thus enhancing evidence-based practice and reflective practice, and helping the preparation of graduates to the incessant demands of autonomous practice roles (Lall, Klein, & Brown, 2003). As a result, curricula content had to be revisited and adjusted to the novel and evolving needs of the societal and workforce demands. This applies to the general curricula content, but also to specific curricular components such as pediatrics. When discrepancies exist between the realities of practice for pediatric occupational therapists (Brown et al., 2007) and the pediatric content taught in educational institutions (Rodger et al., 2006), these misalignments should be rectified. Multiple strategies need to be developed in order to consolidate an effective workforce planning. In general, greater collaboration between researchers, academics and health care planners is essential to bridge adequately the planned curricula with the needs of the workforce.

Many aspects need to be considered to ground the context of the pediatric occupational therapy education and practice in Canada. Acknowledging international guidelines should help local agencies to support competency and education standards in occupational therapy. Educational curricula must be relevant to address the evolving needs of the profession as well as the population (Nayar et al., 2013). Understanding the

current context of occupational therapy education and practice in Canada is of importance to enhance curriculum development. Attention from educational institutions needs to be displayed on these aforementioned elements to ensure the survival of the profession and to reach high quality standards in occupational therapy education. Understanding the global portrait of the multilevel context of the profession and the national context of pediatric practice is fundamental and serve as the basis for the justification of this literature review, which will be articulated below.

Justification for the Present Study

The next section will detail arguments to engage in the present study. First, it will be presented that students' perceptions of their preparedness for practice is of great importance for curricula development but also constitutes one of the main challenges for universities. In order to support the profession and assist academic institutions' challenges, conducting research in this field can reveal positive input for stakeholders. Second, the occupational therapy literature reveals gaps in research investigating the preparedness of students. The current evidence shows a high percentage of graduates feeling unprepared for pediatric practice in Australia and New Zealand. In Canada, limited research has covered specifically the preparedness of students for the pediatric field, but Hodgetts et al. (2007) found that occupational therapy students and recent graduates generally do not feel competent upon graduation. Third, deeper concepts underpin the examining of preparedness of occupational therapy students and graduates such as social inclusion for children with disabilities. In this context, there is hope that engaging in this kind of research will be in the long run beneficial for the social inclusion of children.

Challenges of the educational institutions. Universities encounter numerous challenges to develop occupational therapy students' knowledge and skills. During curriculum development, internal and external curriculum components, or factors, need to be involved, or consulted, in order to ensure programs are contemporary and relevant to universities, key stakeholders and students (Brown, Bourke-Taylor, & Williams, 2012). The following section will discuss these critical elements by exploring the learning philosophy of universities, the employers' expectations and the students/graduates' perceptions.

Given the professional diversity of occupational therapy, the challenge for educational institutions is to prepare students with a range of knowledge and skills for all practice settings (Nayar et al., 2013). In the current ever-changing era, academics stimulate students to acquire knowledge and develop autonomous critical thinking for practice (Bannigan & Moores, 2009; Robertson & Griffiths, 2009). Several authors support this reflexive practice where understanding how knowledge is derived is essential (Bannigan & Moores, 2009; Blair & Robertson, 2005; Robertson & Griffiths, 2009). This is an important skill that educational programs must ensure. In addition to reflective practice, authors agree that occupational therapists must demonstrate evidence based practice (Bannigan & Moores, 2009; Townsend & Polatajko, 2007). The utilization of research information and science is an important underpinning in curricula (Bannigan & Moores, 2009; Townsend & Polatajko, 2007). Students are required to develop high-level thinking skills, and both reflective and evidence based practice are taught in occupational therapy programs (Bannigan & Moores, 2009). Many elements and criteria compose the

philosophy of education institutions and these can become complex challenges for universities.

Next, once the learning philosophy of educational programs is established, another element that academic institutions have to consider is the employers' demands and expectations. Whilst it is not the direct mandate of universities to respond to all employers' requests, a balance should exist to integrate these needs with trends and development in educational theory (Mulholland & Derdall, 2004). Many authors found that the major expectation for employers is graduate attributes, thus mainly professional competencies (Mulholland & Derdall, 2004; Robertson & Griffith, 2009). These encompass the skills, abilities, knowledge, and attitudes students acquired during their studies to become competent occupational therapists (Brown et al., 2012). Then, employers tend to favour personal traits. It is noticeable in the literature that opinions about desired personal skills vary considerably between authors. For instance, Mulholland and Derdall (2004) noted the importance of team skills, willingness to learn and personality while Barnitt and Salmond (2000) suggest that time management or coping with limited resources are valued traits. Finally, position specific requirements seem to be a third element preferred by employers (Hodgetts et al., 2007; Mulholland & Derdall, 2004). Authors tend to agree that generally employers will privilege their specific practice area when commenting on graduates' skills (Barnitt & Salmond, 2000; Hodgetts et al., 2007). This tendency from employers to look for specific expertise in their practice area is understandable given that they need clinicians with particular knowledge and skills. Using employers' input is a relevant strategy for curriculum

committees to inform and develop professional currency in educational curricula (Mulholland & Derdall, 2004).

A third aspect educational programs need to examine is how well students and new graduates feel equipped for practice. To understand this, universities are collecting student feedback to monitor students' perceptions and improve quality of teaching (Tucker, 2013). While this practice seems common within academic institutions for the last 60 years, there is a lack of research on the impact of student evaluations on quality in teaching and learning (Tucker, 2013). For instance, to date, only a small body of literature has examined the preparedness of students in occupational therapy as well as occupational therapists from their own perspectives (Gray et al., 2012; Hodgetts et al., 2007; Robertson & Griffiths, 2009). Yet, authors note that an essential part of curriculum development lies in the feedback provided by students experiencing it (Morrison, 2003; Prideaux, 2003). The literature lacks clarity about how educational programs should prepare students for practice. Discrepancies exist between what is seen as essential by educational institutions and the reality of the workplace for new graduates. For instance, Robertson and Griffiths (2009)'s study revealed that the predominant issues for new graduates are difficulties with role clarity, inadequate supervision, an insufficient comprehension of skills and ambiguity in team responsibility. Furthermore, the study highlighted that those main issues were overshadowed by lack of confidence. Despite the challenge for universities to consider student feedback, evaluating the students' perceptions constitutes a huge benefit for curriculum improvement.

Education institutions are facing complex challenges to ensure informed and innovative occupational therapy curriculum. In order to overcome these challenges,

several stakeholders need to engage in the process. The university's philosophy, the employers' demands and the students/new graduates' perceptions are among the key elements that educational programs need to take into account to enhance curriculum development.

Preparedness of occupational therapists. Developing competent occupational therapists through academic programs is of major importance for health care (Gray et al., 2012). Occupational therapists need to demonstrate practice that balances cognitive knowledge, practical skills and decision-making abilities (Nayar et al., 2013). Feedback provided by surveys from students and graduate occupational therapists is essential as it can be used in curriculum development. However, limited published studies (perhaps due to the great variability across individual programs worldwide or the complex issues around informed consent) have considered the overall perceptions of occupational therapy students and graduates of their education and preparedness for practice (Gray et al., 2012; Hodgetts et al., 2007; Robertson & Griffiths, 2009). Furthermore, the evaluation of education preparedness of students aiming to work with a pediatric clientele and pediatric occupational therapists is quite scarce.

One of the few studies examining this was conducted in Australia and Aotearoa/New Zealand in 2012 (Gray et al., 2012). This study found that 30% of respondents working in pediatrics in Australia were either undecided or disagreed with being well prepared for practice and that 20% of Aotearoa/New Zealand new graduates felt unprepared for pediatric practice (Gray et al., 2012). Findings from countries with similarities to Canada can be of relevance to examine this specific issue. Key findings of a Canadian research study addressing the global perception of students and graduates in occupational therapy

indicate that they do not feel clinically competent upon graduation due to a perceived lack of technical skills training and concrete interventions (Hodgetts et al., 2007). One way identified by students to alleviate the lack of technical skills perception is to increase fieldwork experience (Hodgetts et al., 2007).

Fieldwork experience represents one of the fundamental components for preparing students as it provides them with authentic experience and opportunity to apply the skills and values (Holmes et al., 2010). Many studies have explored the benefits of fieldwork placement for students (Aiken, Menaker, & Barsky, 2001; Ferraro Coates & Crist, 2004; Holmes et al., 2010; Scaffa & Smith, 2004). In 2007, the WFOT reaffirmed the minimum requirement of 1000 fieldwork hours for occupational therapy students to ensure integration of theory into practice (WFOT, 2007). Based on Holmes et al. (2010)'s study, maintaining this minimum standard appears to be supported in order to develop competent occupational therapists as general practitioners. However, in Canada, a shortage of general clinical placements in many health professions is recognized (Smith, Corse, & Cobb, 2010). Moreover, the shortage for the pediatric practice and other specialist areas in practice education placements is internationally documented (Overton, Clark, & Thomas, 2009). Therefore, it is difficult to assert at this point if sufficient experience and opportunities in pediatric placements are offered to students.

Overall, few studies have investigated the preparedness of occupational therapy students and graduates. The literature lacks clarity on the topic and gaps need to be bridged. Many factors may influence the feeling of preparedness of students and ultimately their feeling of competency. Fundamental components such as knowledge of assessment/diagnosis and treatment and the overall opportunities of experience may

partially define the concept of preparedness and need to be considered when analysing the preparedness of students. Ultimately, the purpose behind the quest of examining the preparedness of students and graduates in occupational therapy is to achieve high quality standards for the profession and enhance curriculum development in order to promote social inclusion of children with ND. This ambition will be presented in the following section.

Ultimate goal of education preparedness: Maximizing social inclusion of children. The aim of investigating the preparedness of occupational therapy students and clinicians to enhance curriculum development is driven by the ultimate desire of maximizing the social inclusion of vulnerable populations such as children. Improving social inclusion is important for the participation of children with disabilities who are likely more at risk of being socially excluded by their peers (Bourke & Burgman, 2010). Supported by the concept of cumulative advantage of the life course, which emphases on the dynamics of change over the life course and how it can create a cumulative effect that magnifies over time (Willson, Shuey, & Elder, 2007), there is hope that focusing on social inclusion of children will develop successful children whom will then become successful adults participating in all facets of society. Recognizing the needs of children with disabilities such as ND will allow occupational therapists to reduce barriers to participation and social inclusion. Social inclusion is highly valued in occupational therapy (Townsend & Potalajko, 2007) and educational programs have the possibility to tackle this concept at the source by educating and preparing students to provide services that will promote the inclusion of young populations. Social inclusion is an evolving concept that can be described as the opportunity to participate in society and to enact the full rights of

citizenship in everyday life (Whiteford & Hocking, 2012). More precisely, an operational definition of the concept is "social inclusion is about participation; it is a method for social justice. It is about increasing opportunities for people, especially the most disadvantaged people, to engage in all aspects of community life" (Government of South Australia, 2009). The occupational science literature endorses that it is the occupations of individuals and groups in society that form the agency of participation and ultimately social inclusion (Whiteford & Hocking, 2012). Participation is essential to human condition and experience and research shows consistently that it has an important, positive influence on health and well-being (Law, 2002). This concept is especially important for children with neurodevelopmental disorders as it provides opportunities to learn skills, gain performance competence, play, form friendships, and find satisfaction (Law, 2002). For instance, in a national survey in the United States on school participation, results showed that an increase of participation was positively associated with increased health, well-being, and quality of life for children with disabilities (Simoeonsson, Carlson, Huntington, McMullen, & Brent, 2001).

The occupational science literature has related "participation as social inclusion" to the concept of empowerment and enablement (Whiteford & Hocking, 2012). Enablement can occur in many professional fields, but this concept represents a core competency in occupational therapy (Townsend & Potalajko, 2007). According to the Oxford Dictionaries (2014c), the definition of enable is "give (someone) the authority or means to do something; make it possible for". Furthermore, the notion of enablement focuses on equity, justice and resources to enable all people to achieve their fullest health potential through a supportive environment (Townsend & Potalajko, 2007). CAOT supports the

idea that occupational therapists have the knowledge and skills to identify factors to improve individuals' participation and to facilitate the removal of barriers to participation as well as realizing people's potential to contribute to society (CAOT, 2014c). Additionally, in a position statement for children and youth produced by CAOT, the organization recognizes that children have the right to engage in healthy patterns of occupations that promote participation and social inclusion and recommends that occupational therapists address these areas and conduct research in this field (CAOT, 2009). Although social inclusion in occupational therapy can be complex and interwoven with other important concepts, occupational therapy holds an inherent responsibility to enhance social inclusion and participation of children with disabilities within society. Undeniably, the education preparedness of occupational therapy students and practitioners will play part in the outcomes of children with ND and their social inclusion.

Increasing systematic research investigating the preparedness of students and clinicians to work in the pediatric area throughout Canada should be undertaken. This underpins important implications for the growth of the profession, and ultimately for the social inclusion of children with neurodevelopmental disabilities (Hodgetts et al., 2007). Even if universities are unlikely to include every student's desires into a curriculum, findings from studies can help educators to attend to students' needs and frustrations (Hodgetts et al., 2007). Gray et al. (2012) state that "the requirement for safe and competent allied health professionals and the extent to which university programmes prepare graduates for the requirements of the workplace necessitates the need for continued research into newly graduated occupational therapists' perceptions of work preparedness" (p.447). Ultimately, a transparent and mutual communication between

education program developers and students must exist as the students of today will become the professionals of tomorrow.

This literature review identified and recognized the needs of significant groups of clients embedded under the umbrella of neurodevelopmental disorders. Educational institutions must ensure that pediatric fundamentals and prevalent diagnoses in practice are covered within the curriculum. Also, the literature reviewed the multilevel context factors, from international priorities to local realities, guiding and influencing the occupational therapy education system in Canada. Efforts are deployed by international instances to ensure health and well-being for vulnerable populations such as children. However, the literature reviewed lacks evidence about how occupational therapy curriculum content is weighted and how this may impact the preparedness of students and graduates working in pediatric practice. Statistics show that despite the significant number of occupational therapists involved with youngsters, a small percentage of pediatric content is allotted to the Canadian curriculum. The literature was also reviewed on one essential component of the present pediatric context of practice in Canada that the profession of occupational therapy must consider for its survival: the workforce. Universities must respond to the changing needs of the workforce as graduates represent the blood life of the profession. The literature reviewed found that a fair number of students and graduates in other countries similar to Canada felt unprepared for pediatric practice. No Canadian studies looking at the perceived feeling of preparedness of occupational therapy students and graduates to work in pediatric have been found. Regardless of the complex challenges universities are facing, it is important for academics to continually adjust and renew the occupational therapy curriculum in order to

keep practitioners accountable. Investigating the students and graduates' perspectives on their preparedness for pediatric practice is crucial and contributes to curriculum development. This research project aims to explore some aspects of the preparedness of students and graduates to work with children with ND in a Canadian context. Given the occupational therapy's philosophy and value regarding the inclusion of vulnerable people, there is hope that examining the perceptions of students and graduates will support educational programs to enhance curriculum, and in turn improve the health and inclusion of children with ND.

Chapter 3 Methods

This chapter will describe the different components included in the methods of the research study. First, the research questions and design will be presented. Second, the research instrument, the study sample and the recruitment procedures will be described. Third, the data collection and analysis will be detailed followed by an examination of ethical considerations. This chapter will define the core processes used to complete the research study.

Research Question

The purpose of the present study is to generate and describe preliminary data on the perspectives of occupational therapy students and occupational therapists on their level of preparedness received by occupational therapy entry-level curricula in Canada to practice with children with ND. Specifically, the research project has been conducted to answer the question: *How do Canadian occupational therapy students and occupational therapists perceive their level of preparedness provided by entry-level curricula to work with children with ND?* In order to define and support the analysis and comprehension of the initial question, subquestions have been developed:

1. What is the relationship between the experience (work/volunteer or clinical) of participants and perceived level of competency in meeting the needs of children with neurodevelopmental disorders?
2. What is the relationship between the knowledge of assessment/diagnosis and treatment reported by participants and their perceived level of competency?
3. What is the relationship between the education background of students and their perceived level of competency?

Research Design

In order to answer the research question, this study is a secondary analysis of survey data that was collected from a previous research project. HELPS Inc is the name of the original study (Villeneuve et al., 2013). The HELPS Inc project was a multi-site, multidisciplinary research team that conducted a mixed methods study. The HELPS Inc study was designed to:

1. Describe the social inclusion of preschoolers with intellectual or developmental disabilities in educational, social or recreational settings as they transition into school
2. Identify the needs, challenges and successful actions of parents, healthcare professionals, and healthcare professional students as they work to promote the social inclusion of preschoolers with intellectual or developmental disabilities during the transition to school
3. Help parents, healthcare providers and educators communicate with each other and collaborate more effectively.

The HELPS Inc study consisted of surveys completed by parents, healthcare professionals, educators, healthcare professional students and education students. Additionally, 13 multiple perspective case studies were conducted in three provinces. The present study was designed to examine the data from the occupational therapy discipline, an aspect that had not been addressed in the HELP Inc study. Specifically, the present study consisted of the secondary analysis of the survey data retrieved only from the subsamples for the occupational therapy students (N=179) and occupational therapists (N=50). Mixed

methods were used to elucidate the research questions. The original participant's consent was compatible with the goals of the present secondary analysis research project.

Research Instrument

The HELPS Inc project adapted an existing questionnaire, the McGill Inclusive Education Questionnaire (MIEQ). The MIEQ was initially developed following an extensive review of the published literature on teacher beliefs and perceptions regarding integration of students with developmental disabilities into regular classrooms and by interviews with teachers and special needs consultants across Quebec (Daniel, 2011) (Appendix F). The survey was then reviewed by expert education researchers specialized in inclusive education and a team of experienced teachers and School Board research committee members. In addition, a pilot study of the survey instrument was conducted with a sample of 20 experienced teachers and revisions were made to the instrument based on feedback from each of these reviews (Daniel, 2011). The MIEQ is divided into four sections entitled *Demographics, Professional Developmental of Educators in an Inclusive Setting, Student Populations and Strategies and Further Comments and Suggestions.*

The HELPS Inc project required that the MIEQ be adapted for use with healthcare providers and students (Appendices D and E). The adaptations of the MIEQ for use with healthcare providers and health care students were principally in the wording of questions to reflect the respondents' role in healthcare versus a role in education which was the focus of the original MIEQ.

For the present study, data already collected by the HELPS Inc project were used. The surveys included multiple choice questions that captured quantitative data and open ended

questions that necessitated qualitative responses. Section A of the questionnaires encompassed demographics and background information in order to define the characteristics of respondents and was composed of five questions. Section B had eleven items and included information about students and health care providers' current level of knowledge of working with children with different developmental disabilities. Section C asked questions about the actions taken to advocate for individuals with developmental delays or disabilities and encompasses six items. Section D was about the experiences of students and health care providers in meeting the needs of children and was composed of five items.

Participants/Recruitment

The participants for the present study were Canadian occupational therapy students as well as occupational therapists who work with children with neurodevelopmental disorders. As the present research study was a secondary data analysis, recruitment method and participant inclusion and exclusion criteria were based on the HELPS Inc project procedures. The HELPS Inc project was conducted between 2009 and 2013. A convenience sample method was used for the recruitment of students and a purposive sample method was conducted for occupational therapists.

The HELPS Inc study surveyed different healthcare students (N=801 total responded) from seven universities across Canada. One hundred seventy nine (N=179) from the original healthcare students sample were occupational therapy students. Occupational therapy student participants were studying at two different Canadian universities and both groups were at the beginning of the second year of their entry-level programs. Although all students had received some information about children with neurodevelopmental

disabilities prior to participating in the HELPS Inc study, some students may not had received the entire training due to the timing of the survey administration.

In the HELPS Inc research study, 129 healthcare professionals in total responded, 50 of whom were occupational therapists. The occupational therapist participants had to meet the inclusion criteria of the HELPS Inc project (e.g. working with children with disabilities). Occupational therapists were found through the OT Finder database, hence had to be registered with the Canadian Association of Occupational Therapists. This register identifies therapists' primary and secondary client population. Invitations from the HELPS Inc project were sent to therapists working with children under the age of 17 years-old. One potential bias in the recruitment of the occupational therapists sample via OT Finder is that not all Canadian occupational therapists are members of the Canadian Association of Occupational Therapists, and furthermore, not all CAOT members are registered with OT Finder as members provide information on a voluntary basis.

Administration of the Survey/Data Collection

Occupational therapy students completed the paper and pencil survey version on one occasion taking approximately 30 minutes to complete. Each group completed the survey either after class at the university or after an interprofessional half-day module on working with people with developmental disabilities at the university. Informed consent for occupational therapy students was implied through completion of the survey for the HELPS Inc study.

For the occupational therapists, the HELPS Inc research project sent an invitation via email. Potential participants were given a link to the HELPS Inc research office at one of the involved university of the project to get additional information or express their

interest in participating. Informed consent for the professionals was sent along with the information letter (Appendix C). This secondary analysis was in keeping with the signature page item "I agree for the data collected to be used for future related studies" (Appendix C). Occupational therapists who agreed to participate in the study were asked to complete one survey as well, taking approximately 30 minutes to complete. Questionnaires were either online or paper and pencil version based on the participant's choice and they were completed at a location most convenient to them.

For the present research, data were already collected via the HELPS Inc project. They were stored in a database housed at one university's highly secure server site, which includes firewalls, traffic monitoring and other standard security measures 24 hours/day, 7 days a week. The HELPS Inc. online questionnaires were created through a custom program built with HTML and ASP programming languages. The information has been stored in an ACCESS database on a secure server housed in Canada with an SSL security certificate. The researcher's supervisor was a co-investigator on the original HELPS Inc project and had access to the data on a password protected computer at Dalhousie University. The data was shared with the researcher via Dalhousie File Transfer/Drop, an encrypted, secure file sharing mechanism. The researcher only had access to code numbers as identifiers on questionnaires so data was treated anonymously. For the current study, the Statistical Package for the Social Sciences version 21 (SPSS) software was used to analyze the data.

Data Analysis

Initial data preparation. Data were collected by the original HELPS Inc project and entered into the SPSS database. For the present study, the researcher cleaned the original data sets where necessary to ensure that only data from occupational therapy students and occupational therapists were kept and saved in distinct SPSS files. Additionally, a Microsoft Word document containing the qualitative answers from participants was cleaned for the occupational therapist students and one was created for the occupational therapists to guarantee that only the targeted participants were selected for the present study. Then, based on the three subquestions to answer the research question of the present study, only the data from survey questions containing variables of relevance and interest for the present study were kept for the analysis. The data from the original data sets that did not include the variables of interest to the researcher (e.g. no relevance to the specific research questions or not related to demographic questions) were removed. Then, specific manipulations occurred depending on the question, detailed information is provided in the following section. However, it is important to note that questions in section B from both students and professionals' surveys were originally designed as a Likert scale with words instead of numeric values, thus numerical values were assigned to the words of the ordinal scale (e.g. Very limited=1). These numeric values were treated "as if" they had the properties of an interval scale. This was done for analysis purposes to enable the use of parametric statistical methods. In occupational therapy and other health disciplines, ordinal scales are the most frequently used scales (Kielhofner, 2006). It is a common and widespread practice in health sciences to analyze ordinal data as interval data, although a debate still exists between researchers (Kielhofner, 2006). As this

practice has been controversial, there has been a long-standing argument between the supporters of two opposite paradigms (Wang, Yu, Wang, & Huang, 1999). For example, Velleman and Wilkinson (1993) support the idea that a statistical approach with an a priori scale type that proscribes statistical methods or tests based on the scale type is simply bad science and bad data analysis. Norman (2010) stressed the importance of "robustness", which is the "extent to which the test will give the right answer even when assumptions are violated" (p.627). When the chance of violating the assumptions is not, or not very much, increased, then we can use parametric statistical tests (Norman, 2010). In the literature, there is support for using parametric statistical tests with Likert scale data (Norman, 2010).

Presentation of the questions used for analysis. Table 1 presents the nine questions kept from the original student survey for the analysis, based on the research questions for the present study. The table also provides an overview of the measurement scale of questions as well as the manipulations conducted for the present study. Responses to section A were related to the demographic characteristics of participants. In that section, responses addressing the participants' previous qualifications (question A6) named a wide variety of programs, thus these responses have been clustered into four main categories (health sciences, kinesiology, psychology and other degree) in order to facilitate data analysis. Section B's questions were originally designed as Likert scale and data had received coding from the HELPS Inc study (coded from 0 to 3 or from 1 to 4). For the present study, all section B's questions kept for the analysis were coded from 1 to 4 to maintain uniformity among data and data sets. Also, questions B1, B2 and B5 included responses for ten diagnoses. The different diagnoses were collapsed into one variable

resulting in the mean of the means for each of these three questions. This decision was made to first simplify the data, and second because comorbidities occur frequently in practice. Finally, section D's questions kept for the present study were open-ended questions and use for qualitative analysis. The data collected from section D allowed further exploration of the results from the quantitative analysis.

Table 1 *Overview of Students' Questions, Survey Data Measurement and Present Study Manipulations*

Section A Questions	Survey Data Measurement	Present Study Manipulations
A1 What gender are you?	*Nominal*	*No modification*
A2 What is your age?	*Ratio*	*Clustered into 2 categories* (≤ 25 and ≥ 26)
A5 Which degrees and/or qualifications have you already completed?	*Nominal*	*Clustered into 4 categories* (Health sciences, kinesiology, psychology, other degree)
Section B Questions		
B1 How would you rate your current level of knowledge regarding the assessment/diagnosis of children with the following [diagnoses]? (see Appendix D for the list of diagnoses)	*Ordinal:* Very limited Limited Moderate Extensive	*Assigned numerical values:* 1-Very limited 2-Limited 3-Moderate 4-Extensive
B2 How would you rate your current level of knowledge regarding the treatment of children with the following [diagnoses]? (see Appendix D for the list of diagnoses)	*Ordinal:* Very limited Limited Moderate Extensive	*Assigned numerical values:* 1-Very limited 2-Limited 3-Moderate 4-Extensive
B5 Do you have experience (work or volunteer) with children with the following developmental delays or disabilities? (Choose all that apply) (see Appendix D for the list of diagnoses)	*Ordinal:* Very limited Limited Moderate Extensive	*Assigned numerical values:* 1-Very limited 2-Limited 3-Moderate 4-Extensive
B9 How competent do you feel in meeting the needs of children with developmental delays or disabilities?	*Ordinal:* Not very competent Mildly competent Moderately competent Very competent	*Assigned numerical values:* 1-Not very competent 2-Mildly competent 3-Moderately competent 4-Very competent
Section D Questions		
D1 Please give one example of a situation in which you felt particularly successful in meeting the needs of a child with a developmental delay or disability.	***	***
D3 Did your actions in this situation help to promote the social inclusion of this child? If so, how? (Only the second question constitutes D3)	***	***

For the occupational therapists, a total of ten questions were selected from the original survey in order to answer the present study research question (Table 2). Table 2 summaries the measurement scale of questions and the manipulations executed for the present study. In section A questions, one included postal code, which responses have been translated into geographic location (e.g. B3K was translated as Nova Scotia). Similarly to students, as the HELPS Inc project had coded data either from 0 to 3 or 1 to 4 in section B questions, responses were assigned numeric values from 1 to 4 for the present study. For questions B1, B2 and B5, same as students, the ten different diagnoses were combined into one variable "collapsed diagnoses" and section D's questions served for the qualitative analysis in order to further explore or support the quantitative results.

Table 2 *Overview of Occupational Therapists' Questions, Survey Data Measurement and Present Study Manipulations*

Section A Questions	Survey Data Measurement	Present Study Manipulations
A1 What gender are you?	*Nominal*	*No modification*
A2 What is your age?	*Ratio*	*No modification*
A4 How long have you worked in your current occupation? (in years)	*Ratio*	*No modification*
A5 What are the first three digits of your postal code?	*Nominal*	*Digits of postal code translated into geographic location*
Section B Questions		
B1 How would you rate your current level of knowledge regarding the assessment/diagnosis of children with the following [diagnoses]? (see Appendix D for the list of diagnoses)	*Ordinal:* Very limited Limited Moderate Extensive	*Assigned numerical values:* 1-Very limited 2-Limited 3-Moderate 4-Extensive
B2 How would you rate your current level of knowledge regarding the treatment of children with the following [diagnoses]? (see Appendix D for the list of diagnoses)	*Ordinal:* Very limited Limited Moderate Extensive	*Assigned numerical values:* 1-Very limited 2-Limited 3-Moderate 4-Extensive
B5 Do you have experience in your practice caring for children with the following developmental delays or disabilities? (see Appendix D for the list of diagnoses)	*Ordinal:* Very limited Limited Moderate Extensive	*Assigned numerical values:* 1-Very limited 2-Limited 3-Moderate 4-Extensive
B11 How competent do you feel in meeting the needs of children with developmental delays or disabilities?	*Ordinal:* Not very competent Mildly competent Moderately competent Very competent	*Assigned numerical values:* 1-Not very competent 2-Mildly competent 3-Moderately competent 4-Very competent
Section D Questions		
D1 Please give one example of a situation in which you felt particularly successful in meeting the needs of a child with a developmental delay or disability.	***	***
D3 Did your actions in this situation help to promote the social inclusion of this child? If so, how? (Only the second question constitutes D3)	***	***

Overview of the analysis process. The characteristics of participants were examined to understand the sample characteristics. Percentages were calculated for nominal variables for the students (e.g. gender, qualification and the background education degree) and for occupational therapists (e.g. gender, geographic location as well as the language). For students, the age of participants was assessed using categories. In order to understand the central tendency and the variability of the professional sample, the age and years of experience of participants were described using respectively means, minimum/maximum values and standard deviations. Once the examination of the characteristics of all respondents was completed, analysis was conducted to answer the specific study subquestions. In the present study, missing data were managed in SPSS using primarily the "exclude cases listwise" option, thus meaning that participants for who there were missing data were deleted before performing any further analysis.

The following paragraphs will describe the analysis process conducted for each subquestion. A visual representation of the process is summarized in Figure 1, 2 and 3 followed by textual precisions. Here is the process conducted to answer the first specific research question: What is the relationship between the experience of participants and perceived level of competency in meeting the needs of children with neurodevelopmental disorders?

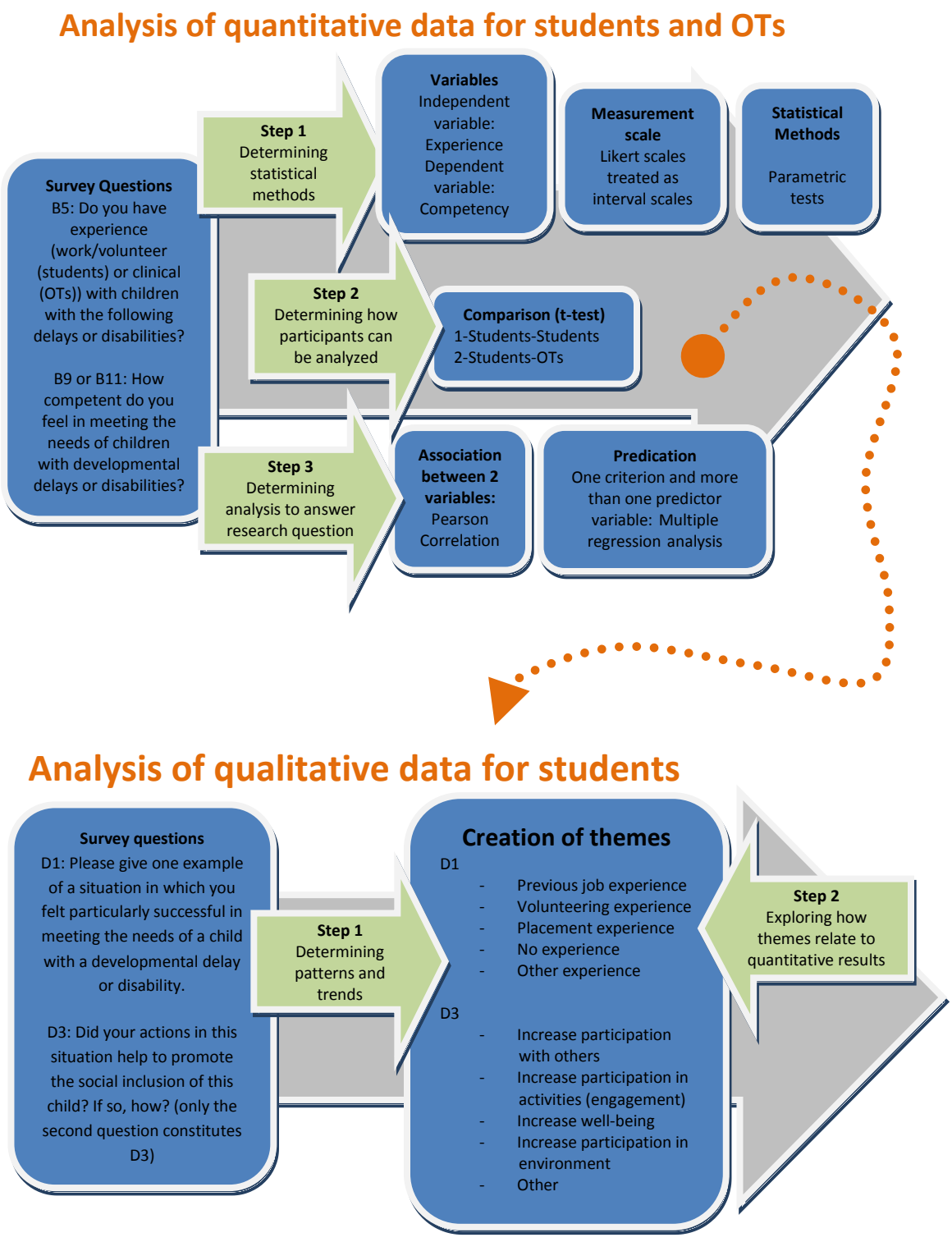

Figure 1. Overview of the analysis process for subquestion 1: What is the relationship between the experience of participants and perceived level of competency in meeting the needs of children with neurodevelopmental disorders?

Figure 1 depicts the steps for the analysis of the first subquestion. An initial reflection was made on what were the appropriate statistical methods to use. As the variables of the selected survey questions for subquestion 1 were treated as interval data, it was indicated to undergo parametric statistics.

The second step of the analytic process was to determine whether different groups of participants could be combined for analytical purposes. To make this determination, two sample independent t-tests were conducted to determine if the groups were significantly different from each other or not. The first groups that were compared were the student groups from each university. The assumption of homogeneity that is necessary for conducting independent t-test analyses was examined. The results concluded the students could be grouped together. In a second step, the students mean score was compared to the mean score of occupational therapists, the result indicated the means were significantly different so the students and occupational therapists were not combined, but analyzed as two distinct groups.

Step three tested whether there was any association between the two variables of interest: the experience and the competency using the Pearson correlation. Pearson correlations were conducted on students' data and then on occupational therapists' data. When a relationship was established for both students and professionals, further analysis was conducted using multiple linear regression analysis. However, as the purposes of both subquestions 1 and 2 were to investigate the relationship between different independent variables using the same dependent variable (competency), the multiple linear regression equation combined variables from both subquestions 1 and 2. Three independent variables (experience, knowledge of assessment/diagnosis and knowledge of

treatment) were included in the linear regression model. No confounding variables such as gender or age were included in the multiple linear regression equation for both students and occupational therapists. Gender was not included as almost all participants were women. Age was not considered a confounding variable for students as the variability in the sample was small. Indeed, more than two-thirds of the sample was between 22-25 years old, knowing that the mean was 25 years with a standard deviation at 2.54 years (Range: 22 to 40 years). For the occupational therapists, age and experience were confounded. Both concepts are intrinsically linked as the older a person is the more likely that person will have experience. However, it is more the experience than the age of a person that will influence the competency. Therefore, the age of occupational therapists was not included in the regression model. The seven assumptions for multiple linear regression (Table 3) were tested prior to carrying out the analysis. In the present study, the first two assumptions were met for both students and occupational therapists as the dependent variable, thus "competency", was treated as an interval scale and the independent variables, "experience", "knowledge of assessment/diagnosis" and "knowledge of treatment" were also treated as interval. The third assumption was determined with the use of Pearson correlation. In order to test homoscedasticity, the fourth assumption, a fit line has been introduced into the scatterplot looking at the variables of interest computed by SPSS. The variance of error term or, in other words, the random disturbance in the relationship between the independent variables and dependent variable should be the same across all values of the independent variables to meet the assumption. The scatterplots for both students and occupational therapists showed that the random disturbance across values were similar. The fifth assumption of

multiple regression analysis is no or little multicollinearity. Multicollinearity occurs when two or more independent variables are highly correlated. Multicollinearity was tested using the correlation matrix, the variance inflation factor (VIF) and the condition index in SPSS. If the test values are respectively above 0.80, 10 and 30 for these tests, the regression may have significant multicollinearity (Kielhofner, 2006; StatPac, 2014). If multicollinearity was detected in the first model, a second regression model was tested without the highly correlated variable(s). The sixth assumption is the need to have multivariate normal distribution of the disturbance term, or in other words, the random error in the relationship between the independent variables and the dependent variable in the regression model. Measures of shape, such as skewness and kurtosis, were analyzed to see if the variables had a normal distribution. Dividing the measures of shape by their standard error should result in values between -1.96 and 1.96 (Wright & Herrington, 2011). Finally, for the seventh assumption, boxplots were analyzed to determine if outliers were present in the distribution. The main purpose of multiple linear regression analysis is to predict the value of a dependent variable based on the values of several independent variables. Therefore, for subquestion 1, this statistical technique was used to determine if the experience (work or volunteer for students and clinical for occupational therapists) significantly predicted the perceived feeling of competency of students and occupational therapists to work with children with ND.

Table 3 *The Seven Assumptions of Multiple Linear Regression Analysis*

Assumptions
1. The dependent variable is either interval/ratio
2. More than one independent variables are included and can be measured in categorical/interval/ratio
3. Linear relationship between independent variables and the dependent variable
4. Homoscedasticity
5. No or little multicollinearity
6. Multivariate normality
7. No outliers

Finally, once the quantitative data analysis was completed, qualitative data analysis was conducted to further explore and understand the quantitative results using D1 and D3 survey questions. In the present study, the qualitative data for students related to the significant quantitative result from subquestion 1. Responses from student participants have been read attentively in order to develop emergent themes (Figure 1). Data were coded with colors and then responses were attributed to their respective theme. Patterns, connections and trends have been identified by analyzing themes.

The analysis process to answer subquestion 2 (What is the relationship between the knowledge of assessment/diagnosis and treatment reported by participants and their perceived level of competency?) will now be presented. Figure 2 provides an overview of the main steps involved for subquestion 2. The following analytic procedures were the same for subquestions 1 and 2.

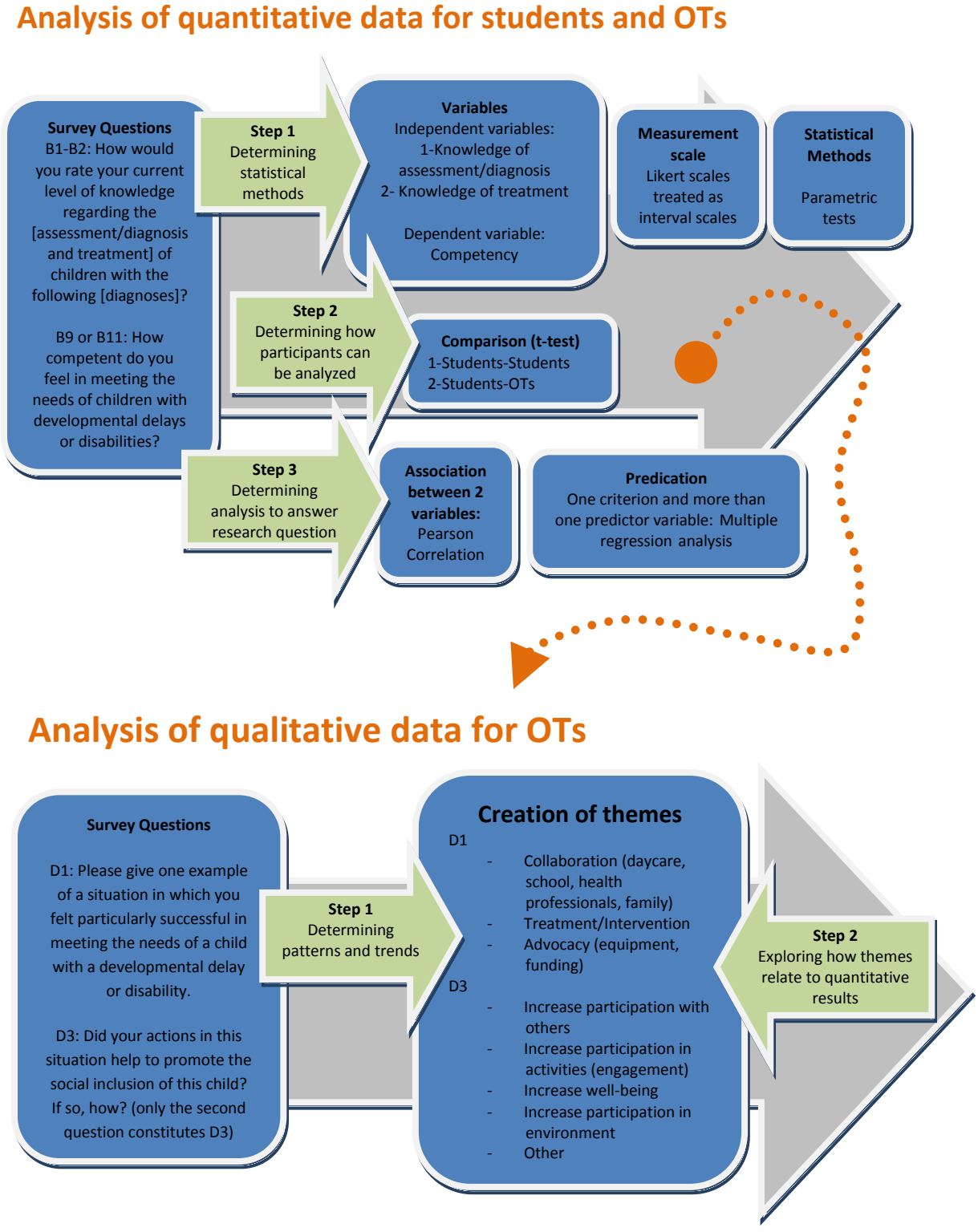

Figure 2. Overview of the analysis process for subquestion 2: What is the relationship between the knowledge of assessment/diagnosis and treatment reported by participants and their perceived level of competency?

The first step of the analysis to answer subquestion 2 was to identify the statistical methods to use. As the independent (knowledge of assessment/diagnosis and treatment) and dependent (competency) variables could be treated as interval data, it was determine that parametric statistics were appropriate. Similar to subquestion 1, the second step of the analytic process was to determine whether different groups of participants could be combined for analytical purposes. To make this determination, two sample independent t-tests were conducted to determine if the groups were significantly different from each other or not. The first groups that were compared were the student groups. The assumption of homogeneity, that is necessary for conducting independent t-test analyses, was examined. The results concluded the students could be grouped together. In a second step, the students mean score was compared to the mean score of occupational therapists, the result indicated the means were significantly different so the students and occupational therapists were not combined, but analyzed as two distinct groups.

Step three tested whether there was any association between the two variables of interest: the knowledge of assessment/diagnosis and treatment and the competency using the Pearson correlation. Pearson correlations were conducted on students' data and then on occupational therapists' data. As explained previously in subquestion 1, when a relationship was established for both students and professionals further analysis was conducted using multiple linear regression analysis, which combined the variables of subquestions 1 and 2. For subquestion 2, the multiple linear regression analysis' objective was to explore if knowledge of assessment/diagnosis and treatment could potentially predict the feeling of competency of students and occupational therapists.

Finally, as results from the quantitative analysis for students showed that knowledge was not significant, it was judged that qualitative data would not further explain this result to help answer subquestion 2 as students' responses related more to their experience rather than their knowledge per se. However, none of the variables studied for the occupational therapists in subquestions 1 and 2 were significant. To further explore the issues raised by the results of the quantitative analysis from the multiple linear regression analysis for the occupational therapists, qualitative analysis was conducted to explore the possibility of any new interesting discoveries. Therefore, qualitative data from questions D1 and D3 of the professional survey were examined. A similar strategy to the one used with the qualitative data analysis of students to identify patterns and connections between data occurred for occupational therapists. The elaboration of themes added value and quality to the analysis process (Figure 2).

Figure 3 illustrates the process conducted to answer the research subquestion 3: What is the relationship between the education background of students and their perceived level of competency?

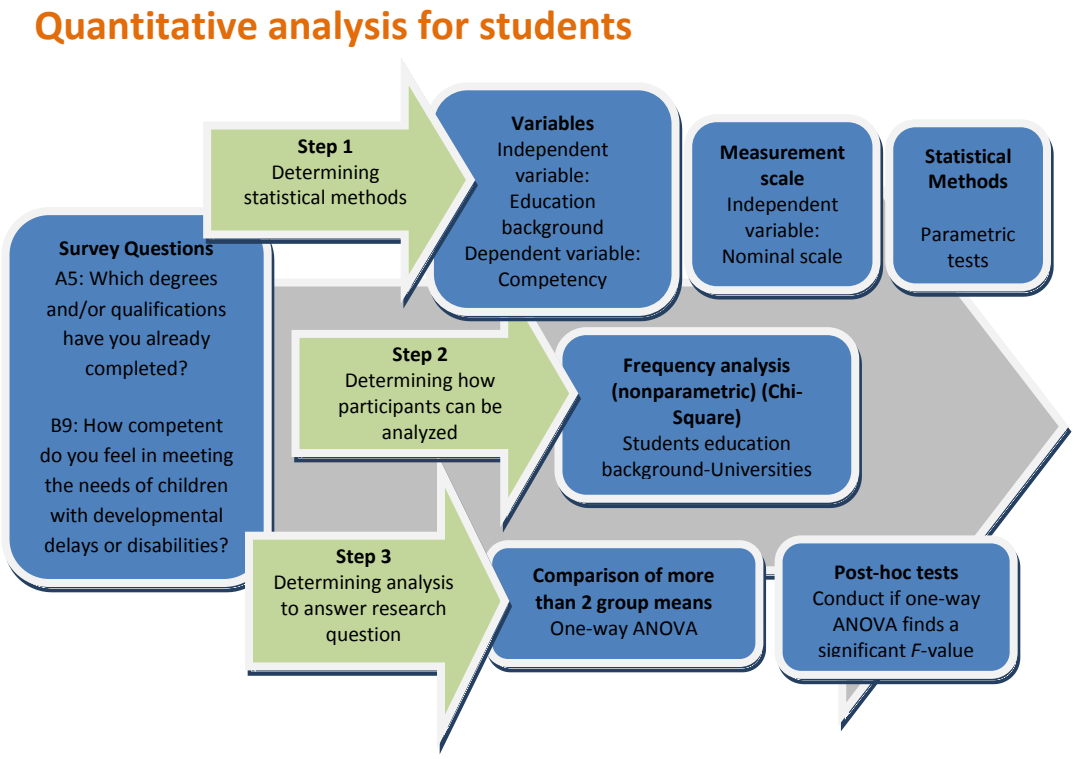

Figure 3. Overview of the analysis process for subquestion 3: What is the relationship between the education background of students and their perceived level of competency?

The decision was made to use parametric statistical tests to answer subquestion 3 as the measurement scale of the dependent variable was treated as interval. In a second step, the presence or absence of an association between the education background of students and their respective university (two categorical variables) was tested using a chi-square test. This determined if student groups had to be analyzed individually or collectively later in the analysis. The last step of the analysis to answer subquestion 3 was to conduct a one way ANOVA to determine the effect of the students' education background on their feeling of competency. One way ANOVA compared the group means of the independent variable (education background), which included 4 groups (health sciences, kinesiology, psychology and other degree), to a single dependent variable (competency). When ANOVA revealed significant results, post hoc tests were performed to identify which

differences between the group scores contributed to the significant result. One way ANOVA identifies whether there are significant differences but it does not specify what kind of differences exist between groups.

Ethical Considerations

The following section will describe the ethical review procedures followed to conduct the HELPS Inc study and the present study. The HELPS Inc project provided all participants a letter of information including the nature of the research project, the necessary actions from participants, the benefits of the research project, the confidential handling of the information gathered as well as the consent to participate in the study. Potential participants who did not consent simply did not respond to the questionnaire. The consent form retrieved for the HELPS Inc project participants did not include a signature line for a request to use quotations. Therefore, in the present study, the qualitative responses to the open ended questions were analyzed for themes but no direct quotations from the study participants were used in order to comply with the limitations of the consent form. Originally, the HELPS Inc project was granted from 12 review ethics boards from various bodies of authorities. The present study was approved by Dalhousie University Social Sciences and Humanities Research Ethics Board.

In the HELPS Inc study, occupational therapy student participants were asked to complete a paper and pencil survey on one occasion taking approximately 30 minutes to complete. Occupational therapist participants who agreed to participate in the study were asked to complete one survey as well, taking approximately 30 minutes to complete. Questionnaires were either online or paper and pencil version based on the participant's choice. No further task was asked from participants for the present study.

In the present study, risks were minimal for participants and the participant's right to privacy was respected as the study used unidentified questionnaires. Initially, the HELPS Inc representative clearly indicated that completing the survey was no obligation from students and that a blank questionnaire could be returned. For the present study, the data collected from the occupational therapy students could indicate that they feel unprepared for practice with children with neurodevelopmental disorders. This could be due to the university and/or the timing of the pediatric content in the OT programs. It is important to note that the researcher's supervisor as well as another member of the HELPS Inc project are faculty members at the School of Occupational Therapy from which the students' data were obtained and are both responsible for this content in the curriculum. They both agreed that it is essential to address the changing needs of occupational therapists in practice to improve curriculum development.

The confidentiality of records was maintained during the study. Identity of participants was kept secured throughout the study process. As mentioned earlier, data were already collected via the HELPS Inc project and stored on a highly secure server site. The researcher only had access to code numbers as identifiers on questionnaires and data was treated confidentially. For a period of 5 years after the last publication of results, all data will be retained in a protected environment. As the current study is a second-hand data analysis, the HELPS Inc. research will be responsible to destroy all the data collected after that period of time.

This chapter has identified and described the research questions as well as the methodology that has been used to obtain results and analyze them. The research methods allowed for collection of information concerning the perceptions of preparedness

of occupational therapy students and graduates to practice with children with ND. The next chapter will present of the results of the present study.

Chapter 4 Results

This chapter will explore the most salient discoveries of the study. First, the characteristics of respondents will be presented. Then, the results for each research question will be articulated. The results will be described and organized in order to answer the respective research questions of the present study. The results will be presented through a combination of text, statistics, tables and figures.

Characteristics of Respondents

The present study examined data from the subsamples of the occupational therapy students (*N*=179) and occupational therapists (*N*=50) who responded to survey of the HELPS Inc project. The occupational therapy student subsample came from two Canadian universities in different provinces. This subsample was analyzed as two distinct groups (group 1: *N*= 58; group 2: *N*=121). All student participants were surveyed at the beginning of the second year of the two year occupational therapy master entry-level curriculum.

Occupational therapy students- Group 1. This first group of occupational therapy students was 97% female with an average age of 25 years. Respondent characteristics from group 1 are described in Table 4. In fact, students qualified with an undergraduate degree represented 97% of the sample. One individual from group 1 had "none" qualification. As occupational therapy program enrollments require a certain level of qualification, this data raised some interrogations. Data were analyzed more closely for this particular individual. This student was 27 years old and did not respond to any the questions asking for details related to the education background. Thus, it seems reasonable to think that this person did not want to disclose this type of personal

information rather than a mistake in completing the survey. More than half of the participants had an undergraduate degree related to kinesiology (51%).

Table 4 *Demographic Characteristics of Student Groups*

	Group 1 (*N*[1]=58) % (*n*)	**Group 2 (*N*=121)** % (*n*)
Gender		
Male	3% (2)	7% (9)
Female	97% (56)	93% (112)
Age		
≤ 25	67% (39)	74% (90)
≥ 26	33% (19)	26% (31)
Qualification		
Certificate	0% (0)	1% (1)
Diploma	2% (1)	2% (2)
Undergraduate Degree	97% (56)	96% (114)
Graduate Degree	0% (0)	2% (2)
None	2% (1)	0% (0)
Background education		
Health sciences	21% (12)	29% (35)
Kinesiology	51% (29)	23% (27)
Psychology	18% (10)	19% (23)
Other degree	11% (6)	29% (34)

[1] *"N" represents the total number while "n" represents the valid number.*

Occupational therapy students- Group 2. Similar to group 1, the majority of the respondents for group 2 were women (93%) with an average age of participants of 25 years old, but three quarter of respondents of group 2 were 25 years old or younger as opposed to two-thirds for group 1. Like group 1, the main qualification of students from group 2 was undergraduate degree (96%), but participants from group 2 had received undergraduate degree related to two main areas: health sciences (29%) and other degree (29%). Table 4 describes the characteristics of respondents from group 2.

Occupational therapists- Group 3. The main language spoken by respondents was English (88%), but some spoke French (12%). Participants were mainly women (96%) and came essentially from Ontario (81%), although two other provinces were represented: Nova Scotia (15%) and Quebec (4%). The average age of participants was 40 years, but a wide range of more than 30 years was present in the sample. The average year of experience in occupational therapy was 16 years, although again here the range varied between 2 to 35 years. Table 5 depicts the characteristics of occupational therapist respondents.

Table 5 *Demographic Characteristics of Occupational Therapists*

	% (*n*)
Language (*N*[2]=50)	
English	88% (44)
French	12% (6)
Gender (*N*=50)	
Male	6% (3)
Female	94% (47)
Geographic location (*N*=50)	
Nova Scotia	15% (7)
Ontario	81% (39)
Quebec	4% (2)

	Minimum	Maximum	Mean	*SD*
Age (*N*=50)	26	57	40.30	19.76
Years of Experience (*N*=50)	2	35	16.39	10.44

[2] *"N" represents the total number while "n" represents the valid number.*

Preparedness of Students and Occupational Therapists: Experience in Relation to Perceived Feeling of Competency

The present study was designed to examine whether the experience (work/volunteer or clinical) of students and occupational therapists had any significant influence on their feeling of competency to work with children with neurodevelopmental

disorders. Specifically, the first subquestion of the present study was: *What is the relationship between the experience of participants and perceived level of competency in meeting the needs of children with neurodevelopmental disorders?* First, descriptive data about the variables of experience and perceived level of competency will be presented. Then, it will be determined how groups were analyzed to answer the subquestion. Finally, the relationship between these variables was examined in order to answer the first research question of the present study.

Experience of students- Group 1 and 2. For student participants, the survey question used to explore the variable "experience" encompassed in the research subquestion 1 was : *Do you have experience (work or volunteer) with children with the following developmental delays or disabilities?* (survey question B5). This survey question included a list of ten diagnoses and the data collected were treated as a 4 point interval scale (1= very limited to 4= extensive). The detailed results from students for group 1 and 2 are described in Table 6. The table illustrates the individual data for the ten diagnoses as well as the result of the ten combined diagnoses, called "collapsed diagnoses". The former was created for the present study as it provides the global experience of participants with children with ND and this result was a key outcome that was used for the analysis. Overall, the global experience of students from group 1 showed a mean of 2.07 (SD=0.59), indicating a limited experience. Group 2 had comparable results (M=1.96; SD=0.70).

Experience of occupational therapists- Group 3. Occupational therapists results were different when compared to the other groups of participants. For instance, their highest and lowest level of experience occurred with different type of diagnosis in

comparison to students. However, it is interesting to note that all groups had less experience with certain diagnoses such as Fragile X and Tourette Syndrome, which is congruent with the reality of practice as these are less prevalent conditions. When results from the different diagnoses were combined, the overall experience of group 3 (*n* =40) had an average score of 2.68, which indicated a limited but close to moderate level of experience, with a standard deviation at 0.49, which was different from student' results. Detailed information about this group is presented in Table 6.

Table 6 *Numbers, Means and Standard Deviations of Level of Experience of Participants for Specific ND Diagnoses and Collapsed Diagnoses*

	Students Group 1 (*N*[3]=58)			**Students Group 2 (*N*=121)**			**OTs Group 3 (*N*=50)**		
	n	*Mean*[4]	*SD*	*n*	*Mean*	*SD*	*N*	*Mean*	*SD*
Specific Diagnoses									
ASD	54	2.46	0.91	103	2.27	1.03	40	3.38	0.81
Down Syndrome	50	2.00	0.86	98	2.01	0.93	40	2.88	0.91
Fragile X	42	1.14	0.42	86	1.28	0.61	39	1.92	0.77
Tourette Syndrome	40	1.28	0.60	89	1.34	0.62	39	1.74	0.82
FAS	45	1.78	0.93	55	1.76	0.94	40	2.20	0.82
Epilepsy	43	1.67	0.75	93	1.59	0.76	40	2.25	1.06
Non-specific ID	46	2.17	0.74	95	2.11	0.99	40	2.90	0.84
Developmental delay	53	2.43	0.87	61	2.30	1.02	40	3.55	0.60
Physical disabilities	51	2.61	0.92	101	2.40	0.96	40	3.50	0.68
Hearing/Vision difficulty	47	2.13	0.77	93	1.85	0.79	39	2.44	0.79
Collapsed diagnoses									
All diagnoses	57	2.07	0.59	109	1.96	0.70	40	2.68	0.49

[3] *"N" represents the total number while "n" represents the valid number.*
[4] *Scale: 1=Very Limited; 2=Limited; 3= Moderate and 4=Extensive*

Comparison of experience between groups. In order to determine if all three groups should be analyzed as one entity or individually for the first research question, comparisons between groups were performed to verify their homogeneity. This comparison between groups determined if they were likely to be similar or significantly different. The statistical method used was an independent samples t-test to compare the means of the two groups of students. The assumption of the t-test (Levene's test or test of homogeneity) was met to examine the result of the t-test ($p>0.05$).

An analysis was conducted on student groups for the combined diagnoses category. Results of the independent samples t-test showed that the mean experience between student group 1 ($n=57$, $M= 2.07$, $SD=0.59$) and student group 2 ($n=109$, $M= 1.96$, $SD=0.70$) was similar ($t(164)=1.03$, $p>0.05$, 95%CI [-0.10, 0.33]).

The t-test was also used to compare means of experience of the combined student groups with the occupational therapists group. Levene's test was not met for these groups ($p\leq0.05$). Overall, the results of the independent t-test for the collapsed diagnoses showed that the student groups ($n=166$, $M=1.99$, $SD=0.66$) had less experience than the occupational therapist group ($n=40$, $M=2.68$, $SD=0.49$), and the difference between both groups was statistically significant ($t(204)=-6.10$, $p\leq0.05$, 95%CI [-0.90, -0.46]). The t-test results indicated that the experience of the two student groups could be examined as one group, but the occupational therapist group had to remain separate as their experience was significantly different. In other words, students and occupational therapists could not be examined as a one entity for research subquestion 1.

Perceived competency. The second variable used to answer subquestion 1 was "competency", which represented student survey question B9 and healthcare professional survey question B11. Occupational therapy students and occupational therapists were asked: *How competent do you feel in meeting the needs of children with developmental delays or disabilities?* Responses were noted on a 4 point scale. Results from all groups are shown in Table 7.

Table 7 *Numbers, Means and Standard Deviations of Perceived Competency for each Respondent Group*

	n	*Mean*[6]	*SD*
Groups			
Group 1 Students (N*[5]*=58)	*57*	*2.96*	*0.65*
Group 2 Students (N=121)	*105*	*2.11*	*0.59*
Group 3 Occupational Therapists (N=50)	*40*	*3.08*	*0.42*

[5] *"N" represents the total number while "n" represents the valid number.*
[6] *Scale: 1=Not very competent; 2=Mildly competent; 3=Moderately competent; 4=Very competent*

Comparison of perceived competency between groups. Independent sample t-tests were used to compare means of the perceived competency between groups. This was done to determine if groups could be combined for further analysis to answer the first research question. First, the t-test was performed on the student groups. Results showed that the mean of perceived competency between student group 1 (n=57, M=2.96, SD=0.65) and student group 2 (n=105, M= 2.11, SD=0.59) was comparable (t(160)=-8.55, p>0.05, 95%CI [-1.06, -0.66]).

Then, the t-test was conducted between occupational therapy students and occupational therapists. In this comparison, results from the t-test indicated significant difference on the perceived competency variable (t(200)=-5.52, $p\leq$0.05, 95%CI [-0.91, -

0.43]) between the student groups (n=162, M=2.41, SD=0.76) and the occupational therapist group (n=40; M=3.08, SD=0.42). It is interesting to note that the mean of students from group 1 was close to the mean of occupational therapists, but by combining the student groups, the difference between means increased.

Overall, the perceived level of competency was similar for students, but different between students and occupational therapists. Results from the t-test for the perceived level of competency were used to determine how participants could be analyzed to answer the research subquestion 1 as well as the subquestion 2 of the present study.

Relationship between experience and perceived competency of participants. The first question was used to elucidate the relationship between the experience of participants and their perceived level of competency. Pearson correlations were conducted on students' data and then on occupational therapists' data. If an association was established for both students and professionals, further analysis was conducted using multiple linear regression analysis. Three independent variables (experience, knowledge of assessment/diagnosis and knowledge of treatment) were included in the multiple linear regression model. However, prior to undergoing this analysis, the assumptions of multiple linear regression were verified. The following paragraphs will present the results of Pearson correlations, then will explore if the multiple linear regression assumptions were met and finally will describe the results of the regression analysis for students and for occupational therapists.

Students. Pearson correlation was used to determine the strength of the relationship between the variables "experience" and "competency" as well as to examine the third assumption to undergo multiple linear regression analysis. The result of the correlation

matrix for the students suggested a low positive correlation between the experience and the perceived level of competency of students, which indicates that the more experience participants have, the more they perceive being competent with children ($r(156)= .36$, $p \leq 0.01$). Table 8 shows the results of the correlations for the students.

A correlation between the experience of participants and their perceived feeling of competency was established and the third assumption of multiple linear regression analysis was met. All residual assumptions were fulfilled for students (Table 9). The correlation matrix (Table 8) showed a correlation between the knowledge of treatment and the knowledge of assessment/diagnosis close to 0.80, but the tests indicated that multicollinearity was not a problem. Although one value of the measure of shape was not within the normal range and one outlier was present, these were negligible and did not jeopardize the robustness of the multiple linear regression. Therefore, a multiple linear regression model was conducted in SPSS. The results of the regression for students indicated that the model had explanatory power and that at least one predictor explained 16% of the variance ($R^2=0.16$, $F(3.154)=9.44$, $p \leq 0.05$). It was found that the variable experience significantly predicted the perceived feeling of competency of students as highlighted in Table 8.

Table 8 *Students- Correlation Matrix and Summary of Regression Coefficients in Multiple Linear Regression Analysis Model for Variables Predicting Perceived Feeling of Competency (Valid N=158)*

Correlation Matrix					Regression Coefficients Model 1				
Variables	***1***	***2***	***3***	***4***	B[7]	SE(B)	β[9]	*t*	*p*[9]
1 Competency	-								
2 Experience	.36	-			0.32	0.09	.29	3.57	.00
3 Knowledge Ax	.27	.37	-		0.15	0.15	.11	0.97	.33
4 Knowledge Tx	.29	.40	.74	-	0.11	0.16	.08	0.69	.49
Constant					1.25	0.25		5.06	.00

[7]*Unstandardized coefficients*
[8]*Standardized coefficients*
[9]*p-value is significant if p ≤0.05*

Table 9 *Summary of Methods used to Explore the Multiple Linear Regression Assumptions and Assumptions' Conclusion for Students*

Assumption	Methods of verification	Justification	Assumption conclusion
1	One dependent variable Measurement scale	Ordinal scale treated as interval scale	✓
2	Three independent variables Measurement scale	Ordinal scale treated as interval scale	✓
3	Pearson correlation	All variables had a linear relationship	✓
4	Fit line in scatterplot	Similar variance of error across values	✓
5	Correlation matrix VIF Condition Index	All values < 0.80 All values < 10 All values < 30	✓
6	Measure of shape: Skewness Kurtosis	1 value = -1,981 *Considered negligible*	✓
7	Boxplot	1 outlier *Considered negligible*	✓

In order to further explore the previous significant result from the regression analysis regarding the experience of students, qualitative analysis from the data gathered in questions D1 *(Please give one example of a situation in which you felt particularly successful in meeting the needs of a child with a developmental delay or disability)* and D3 *(Did your actions in this situation help to promote the social inclusion of this child? If so, how?)* of the survey had been conducted. Students presented examples in successfully meeting the needs of children and how these examples did promote social inclusion of children. For question D1, themes were extracted primarily in relation to where students

took their examples. From there, five themes emerged (previous job experience, volunteering, placement, no experience and other experience). Primarily, examples were taken from previous job experience. For instance, many students mentioned working in either inclusive/summer/sport camps or teaching swimming lessons where they encountered and helped children with disabilities. Some students also reported assisting children with disabilities while babysitting and a few students worked previously as school teachers. Alternatively, students were referring to examples taken from volunteering and/or placement experience. Some of those who did not provide examples stated that they did not have experience with children. Themes arising from question D3 related mainly to the participation of children with others, in activities and with their environment, as well as their well-being. In general, students were reporting examples related to improving assistive devices and technology for children and finding strategies to improve independence and participation in activities and interaction with peers. For instance, they attempted to develop barrier-free environments for children with disabilities, one adapted a two handle cup for a child with cerebral palsy and another one used a clock to help the organization of the child. Participants reported that these actions were enhancing the participation of children with their environment and others as well as participation in activities. Anecdotal findings from participants also noted an improvement in the general well-being of children. Overall, students largely stated that the actions taken in their examples were beneficial to the social inclusion of children. Students who had some experience with children were more likely able to provide successful examples in meeting the needs of this population and were generally reporting that these successful situations led to an improvement in social inclusion. Therefore, it

may likely be that students who had a positive experience felt somewhat more competent than students who did not have experience with children as they did not have the opportunity to get a positive outcome from their actions.

Occupational Therapists. In order to answer subquestion 1 and investigate the third assumption to undergo a multiple linear regression Pearson correlations were calculated. The result of the correlation matrix for occupational therapists indicated a moderate positive correlation between the variables experience and perceived competency, again suggesting that the more experience they have, the more respondents perceive being competent ($r(38)=.41$, $p \leq 0.01$). Table 10 illustrates these results.

For the occupational therapist participants, Table 11 provides a summary of the exploration of the assumptions to conduct multiple linear regression analysis. The methods used to verify the assumptions showed that little multicollinearity was present. Indeed, the correlation matrix (Table 10) showed that knowledge of treatment was highly correlated to experience and knowledge of assessment/diagnosis. Results at the correlation matrix showed that these two test values were above 0.80, thus indicating the presence of some multicollinearity. However, the VIF and condition index were also checked and did not indicate the presence of multicollinearity. One value of the measure of shape to determine normal distribution was above 1.96 and few outliers were present. As some assumptions were at the "limit" of being violated but still acceptable, the multiple linear regression analysis was conducted in SPSS. The results of the regression analysis suggested that this first model had no explanatory power ($R^2=0.17$, $F(3.36)=2.45$, $p > 0.05$). The individual result of the regression showed that the experience of occupational therapists did not significantly predict their perceived feeling of competency

(Table 10). As the possibility of some multicollinearity was found in the first regression model, a second model was conducted in SPSS by taking out the highly correlated variable "knowledge of treatment". This was done in order to examine if this variable may have destabilized or impacted the results of the first regression model. The assumption of multicollinearity was checked in the second regression model using the correlation matrix, VIF and condition index. In this case, all test values were respectively under 0.80, 10 and 30, thus indicating that no multicollinearity was present. The second regression model showed that the model had explanatory power (R^2=0.17, F(2.37)=3.73, $p \leq 0.05$). The individual result of the regression showed that the experience of occupational therapists did not significantly predict their perceived feeling of competency (Table 10). Basically, the two models had somewhat similar conclusions, but the second regression model was more reliable as more accurate in its results (e.g. the small significance of F ($p \leq 0.05$) confirms the validity of the regression output, smaller standard errors when examining unstandardized coefficients).

Table 10 *Occupational Therapists- Correlation Matrix and Summary of Regression Coefficients in Multiple Linear Regression Analysis Models for Variables Predicting Perceived Feeling of Competency (Valid N=40)*

Correlation Matrix					Regression Coefficients Model 1					Regression Coefficients Model 2				
Variables	***1***	***2***	***3***	***4***	B[10]	SE(B)	β[11]	*t*	*p*[12]	B	SE(B)	β	*t*	*p*
1 Competency	-													
2 Experience	.41	-			0.25	0.24	.29	1.04	.31	0.28	0.20	.33	1.45	.16
3 Knowledge Ax	.35	.76	-		0.04	0.23	.05	0.15	.88	0.07	0.19	.10	0.41	.68
4 Knowledge Tx	.38	.83	.85	-	0.08	0.29	.10	0.28	.78					
Constant					2.34	0.40		5.90	.00	2.12	0.36		5.90	.00

[10] *Unstandardized coefficients*
[11] *Standardized coefficients*
[12] *p-value is significant if p ≤0.05*

Table 11 *Summary of Methods used to Explore the Multiple Linear Regression Assumptions and Assumptions' Conclusion for Occupational Therapists.*

Assumption	Methods of verification	Justification	Assumption conclusion
1	One dependent variable Measurement scale	Ordinal scale treated as interval scale	✓
2	Three independent variables Measurement scale	Ordinal scale treated as interval scale	✓
3	Pearson correlation	All variables had a linear relationship	✓
4	Fit line in scatterplot	Similar variance of error across values	✓
5	Correlation matrix VIF Condition Index	2 values > 0.80 All values < 10 1 value = 30.73 *Little multicollinearity considered negligible*	✓
6	Measure of shape: Skewness Kurtosis	1 value = 4.14 *Considered negligible*	✓
7	Boxplot	4 outliers *Considered negligible*	✓

Preparedness of Students and Occupational Therapists: Knowledge in Relation to Perceived Feeling of Competency

Knowledge is a broad term used to designate an awareness or understanding gained through education. One of the fundamental ingredients of occupational therapy curricula is to transfer knowledge to students in order to prepare them to practice in the profession. In the present study, the second research subquestion investigated the relationship between the knowledge of assessment/diagnosis and treatment received from entry-level

curricula and the perception of competency of participants. Specifically, the question was: *What is the relationship between the knowledge of assessment/diagnosis and treatment reported by participants and their perceived level of competency?* The following section contains results regarding the relationship between knowledge of assessment/diagnosis and treatment and perceived competency of participants to answer subquestion 2.

Knowledge of students- Group 1 and 2. Responses from the student survey questions B1 and B2 were used to investigate the knowledge of assessment/diagnosis and knowledge of treatment of participants. Tables 12 and 13 present these results for students and also included the results for the "collapsed diagnoses", which are key results that were used for the analysis. The scale, ranged from 1 (very limited) to 4 (extensive). For all diagnoses combined, students from group 1 had higher results for knowledge of assessment/diagnosis (n=58, M=2.10, SD=0.52) than for knowledge of treatment (n=58, M=2.03, SD=0.51). The overall mean of knowledge of assessment/diagnosis of participants from group 2 for the collapsed diagnoses was 2.13 (SD= 0.53) and 2.08 (SD= 0.53) for knowledge related to treatment.

Table 12 *Numbers, Means and Standard Deviations of Knowledge of Assessment/diagnosis of Participants for Specific ND Diagnoses and Collapsed Diagnoses*

	Students Group 1 (N^{13}=58)			Students Group 2 (N=121)			OTs Group 3 (N=50)		
	n	*Mean*[14]	*SD*	*n*	*Mean*	*SD*	*n*	*Mean*	*SD*
Specific Diagnoses									
ASD	58	2.38	0.67	121	2.40	0.77	40	3.23	0.73
Down Syndrome	58	2.24	0.73	121	2.24	0.72	40	3.12	0.61
Fragile X	58	1.41	0.56	121	1.55	0.63	40	2.43	0.81
Tourette Syndrome	58	1.67	0.71	120	1.70	0.71	40	2.30	0.76
FAS	58	2.12	0.77	81	2.12	0.78	40	2.60	0.81
Epilepsy	58	1.95	0.83	120	1.94	0.76	40	2.30	0.91
Non-specific ID	57	2.04	0.68	119	2.19	0.81	40	2.73	0.82
Developmental delay	58	2.38	0.75	81	2.44	0.79	38	3.39	0.50
Physical disabilities	58	2.48	0.76	121	2.62	0.78	40	3.35	0.70
Hearing/Vision difficulty	58	2.34	0.83	120	2.21	0.73	40	2.43	0.84
Collapsed diagnoses									
All diagnoses	58	2.10	0.52	121	2.13	0.53	40	2.78	0.54

[13] *"N" represents the total number while "n" represents the valid number.*
[14] *Scale: 1=Very Limited; 2=Limited; 3= Moderate and 4=Extensive*

Table 13 *Numbers, Means and Standard Deviations of Knowledge of Treatment of Participants for Specific ND Diagnoses and Collapsed Diagnoses*

	Students Group 1 (N[15]=58)			Students Group 2 (N=121)			OTs Group 3 (N=50)		
	n	*Mean*[16]	*SD*	*n*	*Mean*	*SD*	*n*	*Mean*	*SD*
Specific Diagnoses									
ASD	*58*	*2.59*	*0.73*	*119*	*2.50*	*0.80*	*40*	*3.25*	*0.71*
Down Syndrome	*58*	*2.09*	*0.68*	*119*	*2.13*	*0.78*	*40*	*3.20*	*0.61*
Fragile X	*58*	*1.41*	*0.56*	*119*	*1.53*	*0.59*	*40*	*2.45*	*0.88*
Tourette Syndrome	*58*	*1.47*	*0.60*	*119*	*1.60*	*0.64*	*40*	*2.23*	*0.77*
FAS	*58*	*1.69*	*0.65*	*79*	*2.04*	*0.74*	*40*	*2.68*	*0.76*
Epilepsy	*58*	*1.91*	*0.82*	*118*	*1.79*	*0.70*	*40*	*2.20*	*0.94*
Non-specific ID	*57*	*1.95*	*0.79*	*119*	*2.15*	*0.82*	*40*	*2.95*	*0.78*
Developmental delay	*58*	*2.29*	*0.82*	*79*	*2.43*	*0.78*	*40*	*3.45*	*0.55*
Physical disabilities	*58*	*2.59*	*0.77*	*118*	*2.62*	*0.74*	*40*	*3.40*	*0.67*
Hearing/Vision difficulty	*57*	*2.35*	*0.79*	*119*	*2.16*	*0.77*	*40*	*2.55*	*0.82*
Collapsed diagnoses									
All diagnoses	*58*	*2.03*	*0.51*	*119*	*2.08*	*0.53*	*40*	*2.84*	*0.51*

[15] *"N" represents the total number while "n" represents the valid number.*
[16] *Scale: 1=Very Limited; 2=Limited; 3= Moderate and 4=Extensive*

Knowledge of occupational therapists- Group 3. Essentially, occupational therapists results for the collapsed diagnoses related to knowledge of assessment/diagnosis and treatment were respectively at 2.78 (n=40, SD=0.54) and 2.84, both close to *moderate* (n=40, SD=0.51). These information are depicted is Tables 12 and 13.

Comparison of knowledge between groups. A comparison of the means for knowledge of assessment and treatment between groups for combined diagnosis occurred in order to clarify how participants could be analyzed to answer the second research subquestion. For students, the results from the combination of diagnoses demonstrated that for both knowledge related to assessment/diagnosis and treatment, students groups were homogeneous and there was no significant difference between groups. In other words, the result showed that the knowledge of assessment/diagnosis (Ax) and treatment (Tx) means between student group 1 (Ax: n=58, M=2.10, SD=0.52 and Tx: n=58, M=2.03, SD=0.51) and student group 2 (Ax: n=121, M=2.13, SD=0.53 and Tx: n=119, M=2.08, SD=0.53) were similar enough and data could be combined for analysis purposes (Ax: $t(177)= -0.37$, $p>0.05$, 95%CI [-0.20, 0.14] and Tx: $t(175)= -0.52$, $p>0.05$, 95%CI [-0.21, 0,12).

Second, an independent sample t-test was performed to compare means of knowledge of assessment/diagnosis and treatment between the student groups and the occupational therapists group. Overall, the results of the independent samples t-test for the knowledge of assessment and treatment showed that means between student groups (Ax: n=179, M= 2.12, SD=0.53 and Tx: n=177, M=2.06, SD=0.52) and the occupational therapist group (Ax: n=40, M=2.78, SD=0.54 and Tx: n=40, M=2.84, SD=0.51) were significantly different (Ax: $t(217)= -7.14$, $p\leq0.05$, 95%CI [-0.84, -0.48] and Tx: $t(215)= -8.51$, $p\leq0.05$, 95%CI [-0.95, -0.59]). These results mean that students and occupational therapists are distinct groups and should be analyzed separately for the second research question.

Relationship between knowledge and perceived competency of participants. The purpose of the second research subquestion of the present study is to explore the relationship between the knowledge of assessment/diagnosis and treatment and the perceived level of competency of participants in order to determine if these variables are relevant for preparedness of students and occupational therapists. Pearson correlation was used to determine the presence of any association between the variables of interest. As results showed an existing relationship (Tables 8 and 10), it was determined that further analysis would be conducted using multiple linear regression analysis, as described for subquestion 1. The following paragraphs will present the results of Pearson correlations as well as the results of the individual results of the multiple linear regression analysis.

Students. Pearson correlation has been used to determine the association between the knowledge of assessment/diagnosis and the knowledge of treatment and the perceived level of competency reported by participants. The result from Table 8 at the correlation matrix suggested a low positive correlation between the knowledge of assessment/diagnosis and treatment and the perceived level of competency, which means that an increase of knowledge of students enhances their perceived feeling of competency to work with children with ND (Ax: $r(160)= .27$, $p\leq0.01$ and Tx: $r(160)= .29$, $p\leq0.01$).

For student groups, the result of the multiple regression equation found that knowledge of assessment/diagnosis and treatment did not significantly predict the perceived feeling of competency of students (Table 8).

Occupational Therapists. Table 10 shows the result at the correlation matrix of Pearson correlation for occupational therapists. It revealed that a low positive correlation exists between the knowledge of respondents and their perceived competency. This result suggests that more knowledge participants have, the more they perceive being competent (Ax: $r(38)=.35$, $p\leq 0.05$ and Tx: $r(38)=.38$, $p\leq 0.05$).

Once a correlation was established between the knowledge and the perceived feeling of competency of occupational therapists, the multiple linear regression analyses were conducted, as explained in the subquestion 1 section. The first model that included the three independent variables "experience", "knowledge of assessment/diagnosis" and "knowledge of treatment" suggested that the knowledge of assessment/diagnosis and treatment of occupational therapists did not significantly predict their perceived feeling of competency (Table 10). In fact, the results of the first regression model suggested that none of the three predictors had any explanatory power ($R^2=0.17$, $F(3.36)=2.45$, $p>0.05$). Similarly, the second regression model that included the two independent variables "experience" and "knowledge of assessment/diagnosis" showed that the knowledge of assessment/diagnosis of occupational therapists did not significantly predict their feeling of competency (Table 10).

As none of the predictors included in both regression models showed significant results for the occupational therapists, the open-ended questions D1 *(Please give one example of a situation in which you felt particularly successful in meeting the needs of a child with a developmental delay or disability)* and D3 *(Did your actions in this situation help to promote the social inclusion of this child? If so, how?)* from the healthcare professional survey were examined in order to explore if any other factors may influence the feeling of

competency of the professional participants. Responses from occupational therapy professionals were clustered into themes (Figure 2). Based on anecdotal findings, the majority of the participants highlighted that collaboration between people involved with children with ND is a key factor to promote participation and social inclusion of children. This major theme was highlighted by 70% of participants. Collaboration in participant responses was either with the daycare or school system, other health professionals and finally the family. For example, occupational therapists reported collaboration with school staff to promote participation, meetings or conference with the school/educators/family/other health professionals and joint treatment sessions. In smaller proportions, two other minor themes were reported by participants: treatment/intervention (17%) and advocacy (13%). Occupational therapists mentioned that consistent therapy and addressing sensory issues helped in meeting the needs of children with ND. Furthermore, a few professionals stated advocating for parents to access resources for their child, advocating for children to attend specialized schools and advocating for children by writing letters for funding of equipment.

Preparedness of Students: Education Background in Relation to Perceived Feeling of Competency

Education background is necessary to pursue occupational therapy studies. Students entering in entry-level occupational therapy programs have a previous education background, which are commonly undergraduate degrees. Previous undergraduate studies can cover a wide array of domains, but can generally be contained within clusters related to particular fields of studies. Subquestion 3 *(What is the relationship between the education background of students and their perceived level of competency?)* of the

present study examined the relationship between the education background and the perceived feeling of competency of students. Only student participants were required to answer this research question as no data related to the education background of occupational therapists had been collected with the professional survey. The next section will first describe the education background of student participants, then it will examine how student groups could be analyzed to answer subquestion 3 and finally it will explore the relationship between education background and perceived competency of students.

Education background- Group 1. For participants of group 1, 97% (n =56) had an undergraduate degree. Undergraduate degrees related to kinesiology constituted more than half (51%) of this subsample. For more details regarding the education background of group 1, Table 4 can be used as reference.

Education background- Group 2. Similarly to group 1, 96% (n =119) participants from group 2 had an undergraduate degree qualification. In this subsample, degrees related to health sciences were more frequent (29%). Table 4 is describing these results.

Relationship between education background of student groups and perceived competency. A chi-square test of independence was performed to examine the relation between universities and the respective education background of students. The relation between these variables was significant, χ^2 (3, N= 176)= 16.22, $p \leq 0.05$. Significant results were found between education background and universities, which indicated that students groups could not be examined as one entity and needed to remain separate for the analysis.

An analysis of variance using one way ANOVA was then conducted to examine the effect of education background (kinesiology, psychology, health sciences and other

degree) of student groups on their respective perceived feeling of competency. For student group 1, participants with a kinesiology background had the highest self-rated feeling of competency (n=29, M=3.14, SD=0.52), followed by participants with a psychology education (n=9, M=2.90, SD=0.93), health sciences (n=12, M=2.83, SD=0.72) and other education background (n=6, M=2.50, SD=0.55). Despite these differences there were no statistically significant differences between educational background and perceived feeling of competency of students from group 1, $F(3, 52)=1.95$, $p>0.05$. These results suggest that the education background of students does not significantly influence their perceptions of competency to work with children with ND.

In counterpart, group 2 results found that participants with a health sciences background (n=32, M=2.25, SD=0.51) scored higher on perceived feeling of competency when compared to participants with other education background (n=27, M=2.19, SD=0.74), kinesiology (n=25, M=2.08, SD=0.40) and psychology (n=19, M=1.79, SD=0.63). Results from student group 2 indicated that the effect of education background on the perceived feeling of competency was significant, $F(3,99)= 2.75$, $p\leq0.05$. A post hoc comparison using the Bonferroni test indicated that the pair combination between mean scores of health sciences (M=2.25, SD=0.51) and psychology (M=1.79, SD=0.63) background was significantly different. Taken altogether, these results suggest that there is a significant difference between the students who completed a health sciences degree and the ones who completed psychology degree in terms of their feeling of competency. Students with a psychology degree had a lower average score when compared to students with health sciences degree.

To conclude this chapter, an overview of the most salient results from the present study is illustrated by Figure 4. This figure translates essentials of the study. The detailed results in addition to their implications will be summarized and discussed in Chapter 5.

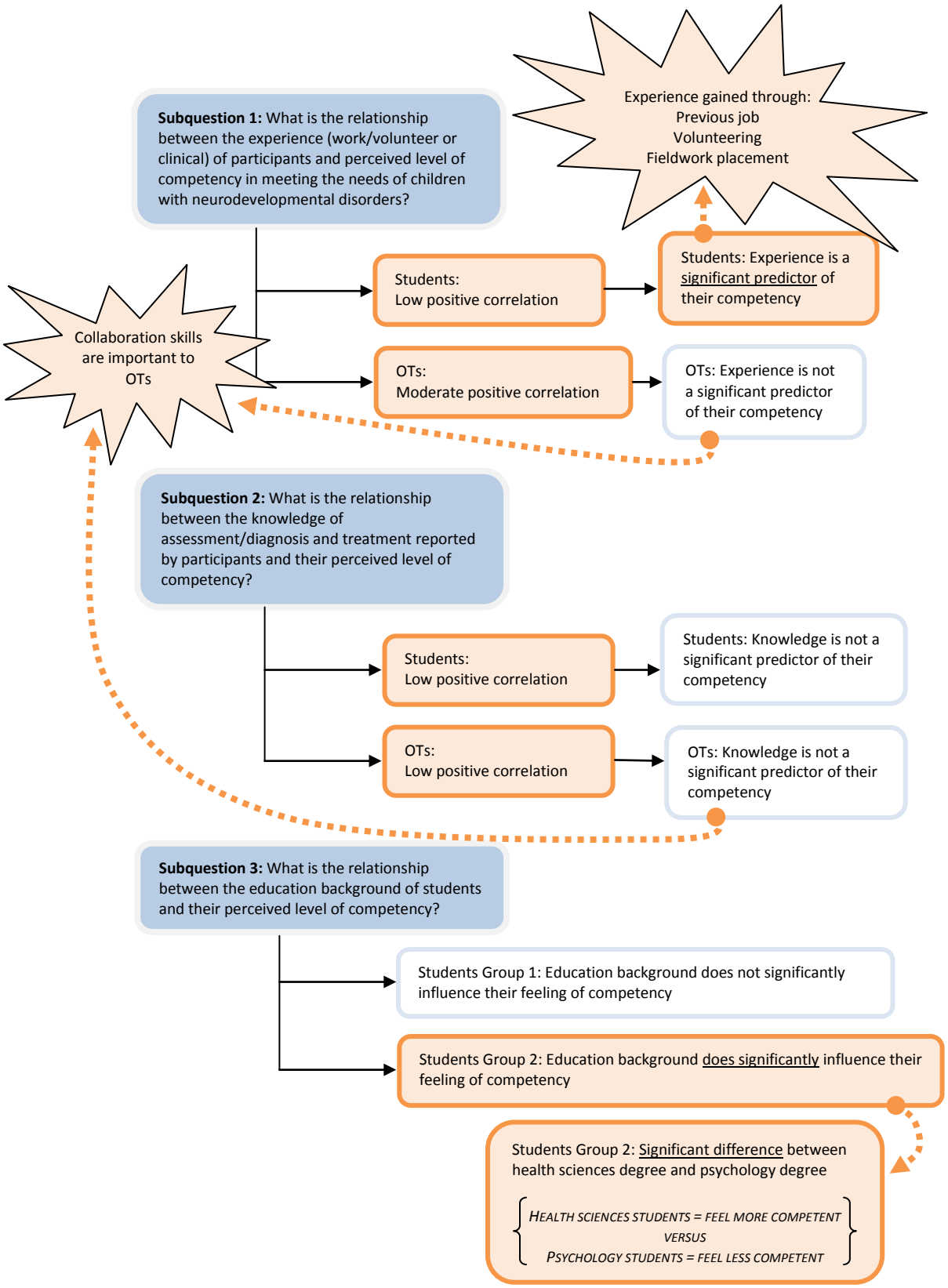

Figure 4. Overview of the most salient results of the study.

Chapter 5 Discussion and Conclusion

The profession of occupational therapy has tremendous potential to enable the engagement and participation in occupations of children with neurodevelopmental disabilities (Brown et al., 2007). In order to provide effective services, occupational therapy students and clinicians must receive a high quality entry-to-practice education program. The literature recognizes that university curriculum is an essential element for a profession and should be reviewed frequently (Merritt, 2012; Morrison, 2003; Prideaux, 2003; Townsend & Polatajko, 2007). Furthermore, the literature provides evidence that the preparedness of occupational therapy students and occupational therapists has been investigated to some extent since the last decade (Gray et al., 2012; Hodgetts et al., 2007; Nayar et al., 2013; Robertson & Griffith, 2009). However, the preparedness associated with the pediatric area has remained largely ignored in studies despite the significant percentage of children receiving occupational therapy services. The mandate of the present study was to explore the perceptions of preparedness of Canadian occupational therapy students and graduates for practice with children with ND and what may contribute to this feeling of preparedness. As a wide array of factors may influence the preparedness of students and graduates, the study focused on specific elements: knowledge of assessment and treatment; experience of occupational therapy students and graduates; and the background education of students. This mixed methods research study was designed with the hope that results may facilitate and support further discussions between stakeholders to enhance occupational therapy programs and practice in Canada for the benefit of children with ND and their families.

Results indicated that distinct elements characterized students and practitioners. These groups have inherent differences when examining preparedness. The knowledge of assessment and treatment, although it has a positive correlation with the feeling of competency of students, is not a crucial predictor of the preparedness of students. In contrast, the experience of students represents a significant predictor. This result was also confirmed by qualitative findings, which showed the importance of experience gained through previous job experience, volunteering and fieldwork placement.

Moreover, the study found that the most common undergraduate education completed by students was different at the universities involved in the research. Contradictory results were observed among student groups regarding the influence of the education background on their perceived feeling of competency. Indeed, no significant effect was established for the first student group while the second group showed significant effect. Specifically, for the second student group, differences were observed between students with a health sciences degree and a psychology degree, showing that students with a health sciences degree felt more competent than students with a psychology degree.

Results for occupational therapists also showed different outcomes. Surprisingly, neither the knowledge of assessment and treatment nor the experience of the practitioners influenced significantly their perceived feeling of competency. Qualitative findings corroborated these results and suggested that collaboration with other key stakeholders for practitioners may contribute positively to their perceived feeling of competency. This chapter will underline and discuss the results of the study and their implications for occupational therapy education programs and practice.

The Distinction between Students and Occupational Therapists

The study revealed that students and occupational therapists have different perceptions in terms of education preparation. Basically, they are situated at different levels in their career and this will influence what they perceive as being important to learn to enhance their practice. This is congruent with the literature. Other studies such as Hodgetts et al. (2007) have acknowledged differences between occupational therapy students and graduates in terms of preparedness for practice. In general, researchers tend to analyze the perceptions of students and clinicians separately. The next section will explore some of the distinctions between occupational therapy students and occupational therapists.

Students. As opposed to graduates and experienced occupational therapists, students have not completed the education program. Students were surveyed halfway through their entry-to-practice program. It is possible that they had not received curriculum content that may have influenced how they answered the survey. Naturally, this factor impacts the way students perceive their preparedness for practice and their feeling of competency. Some students may feel overconfident at this point as they do not realize all the responsibilities awaiting for them after graduation and some may start feeling anxious to undertake their professional role relatively soon. Hodgetts et al. (2007)'s study also observed differences between students near graduation and students near the beginning of the education program in terms of their feeling of education satisfaction and preparedness. Indeed, Hodgetts et al. (2007) found lower levels of satisfaction for students near graduation. Students voiced a lack in technical and intervention skills as well as discrepancy between the initial work expectations and their initial knowledge base. Despite these differences among students, it would be expected that students have

less experience and knowledge and a lower feeling of competency when compared to occupational therapists and the results of the present study confirmed this finding.

Statistically, standard deviations in the present research revealed interesting features from students. Indeed, the experience of students as well as their perceived feeling of competency demonstrated relatively high standard deviations for both groups, which reflected that students used a large range of values in the survey responses. Educators train students to be generalist clinicians in order to be competent in a large array of domains upon graduation. Therefore, it is expected that in a specific area such as pediatrics, students may showed notable differences in terms of opportunities and personal experience. Additionally, some specific language used in the survey, such as "competency", may have generated greater variation in students' interpretation of the term. In this case, it would be realistic to suspect that students may have understood differently the meaning of the questions, which may have led them in diverse directions. Although students' feedback is essential and valuable to improve curriculum, it is worthwhile to underline that students' opinions may show variations from one individual to another. While collecting students' opinions is important, soliciting other feedback from other sources is also needed to provide a full picture of curricular relevance. For example, peer reviews by educational, clinical or subject experts (including those versed in social inclusion issues) may enhance the overall curriculum development.

Occupational therapists. The completion of an entry-to-practice program represents an undeniable advantage for clinicians as they then have the ability to appreciate the global picture of the education continuum in addition to their experience in the field. As attending professional development opportunities is mandatory in Canada, practicing

occupational therapists have likely built a greater repertoire of skills necessary for their areas of practice when compared to students. Through experience gained via practice and professional development, occupational therapists have been given the opportunity to consolidate and bridge theoretical knowledge into practice. Therefore, their comprehension of the profession can provide thoughtful insights to improve education programs and to develop relevant continuing education.

In the study, it was noted that practitioners' standard deviations were consistently smaller and more stable than students. This indicated a greater uniformity among responses of participants. In a way, this reinforces the validity of the results. It shows that clinicians have a similar vision of their education needs. There is evidence in the literature that occupational therapists start feeling considerably confident in their clinical skills two years after graduation (Hodgetts et al., 2007). Therefore, uniformity between respondents was somewhat anticipated as they were all acculturated into the profession for at least two years and were all practicing in pediatric settings.

Occupational Therapy Students: Need for Further Clinical Experience

Experience is the fruit of active participation in events and activities that leads to an accumulation of knowledge and skills. Internationally, the literature recognizes that the experience of students acquired through fieldwork placements is a fundamental component to honed essential skills and values of a profession (Holmes et al., 2010). In occupational therapy programs, experience can be gained through professional practice education through curricula (Towns & Ashby, 2014). It is used as a strategy by occupational therapy faculty to consolidate theoretical knowledge (Towns & Ashby, 2014). In fact, a wide body of literature exists on the topic of clinical fieldwork education

(Aiken, Menaker, & Barsky, 2001; Ferraro Coates & Crist, 2004; Holmes et al., 2010; Scaffa & Smith, 2004). The results of the present study support and confirm the evidence that experience is perceived by students as extremely valued. When looking at students' feedback for curriculum development, it is important to collect information regarding their experience. Students tend to feel more competent when they have the opportunity to experiment in different settings. When students have the occasion to consolidate knowledge through practical situations, a feeling of confidence seems to emerge and contribute to their feeling of preparedness. Hodgetts et al. (2007) found that students appreciated fieldwork experience for the valuable practical experience it provides. The result of the present study supports that finding as well. However, findings from qualitative data in the present study indicated that the experience of students with children with ND was primarily gained from previous work experience such as summer jobs or volunteering. Indeed, although experience achieved during education placement was cited, it was not a primary source of experience for students. As the literature validates the presence of a shortage in pediatric placements (Overton et al., 2009), this finding was anticipated and may confirm that this dearth in clinical education is still a ubiquitous struggle. This situation is concerning and these findings trigger important implications for occupational therapy education and practice.

Occupational Therapy Students: Knowledge Counts but is not Everything

Occupational therapy curriculum is driven by the acquisition of theoretical knowledge. Theory underpinning the pediatric practice has to be internalised by students and is an essential in curricula. Theory is taught to inform clinical reasoning, guide practice and develop interventions for individual needs (Hodgett et al., 2007). Knowledge gained at

university should be the basis for a lifelong learning. The outcomes of this study demonstrated a positive correlation between the knowledge of students and their feeling of competency. However, results concluded that knowledge is not a factor significantly influencing the perception of competency of students. Students seem to need more than theoretical knowledge to feel competent. Applying the theoretical knowledge in the realities of practice seems also a threshold concept for the development of competence for students as acknowledged by the present study. The bridge between theoretical knowledge and practice seems to be built by experience. Therefore, knowledge may represent an essential piece of the puzzle, but requires a combination with other activators to be used to its full potential. Recognizing that the pediatric area has its own specific theoretical frameworks, assessments and treatment methods is critical for stakeholders involved in education of students. However, educational programs should not overestimate the weight of knowledge alone. Knowledge will always remain a necessity in curricula as it defines the relationship between concepts and phenomena of interest and orient practice, but it should not be overrated by educators and programs. The study suggests that other factors contribute more significantly to the feeling of competency of students.

Occupational Therapy Students: Background Education

First, the study found that the most common undergraduate degrees of students differed for each university. The fundamental reason of why students may choose a program over another one is unidentified. Factors such as accessibilities and availabilities of undergraduate programs in provinces, predetermine criteria and individuals' personal

goals and motivation may potentially affect the final decision of students. The original study provided no data about why students chose their specific undergraduate degrees.

Results related to the previous education of students demonstrated mixed outcomes. Specifically, one cohort demonstrated that undergraduate degrees had an effect on their feeling of competency whereas the other cohort showed that background education had no effect on their feeling of competency. The lack of a statistically significant finding for one cohort could be due to a small sample size and a lack of power to detect a significant result. The fundamental reason of this outcome is unidentified but could be explored further in prospective research. However, it is worthwhile to note that the categorization of programs into overarching labels such as health sciences and psychology for the study may have created some interference. For instance, what may have been classified into 'health sciences' for one university may vary widely in terms on curriculum content with the other university.

Occupational Therapists: The Importance of Collaboration Skills

Occupational therapy clinicians' results overall aligned with the current literature on the topic. Similarities can be found when comparing the present study results to previous studies. For example, the Canadian research conducted by Hodgetts et al. (2007) found that longer-term graduates were comfortable with their knowledge and skills. The authors referred to a longer-term graduate as someone who had approximately two years experience in occupational therapy. In the present study, no clinician participant had less than two years experience and therefore can be identified as longer-term graduates such as defined by Hodgetts et al. (2007). Similarly to Hodgetts et al. (2007)'s findings, the present study indicated that the knowledge of assessment and treatment did not

significantly predict the perceived feeling of competency of graduate occupational therapists, which can suggest that occupational therapists felt comfortable enough with their knowledge, skills and experience or that something else transcends these. This may also suggest that knowledge of assessment and treatment or experience alone is not sufficient and therefore underpins the possibility of another predictor present influencing the competency of practitioners. In this study, although treatment/intervention and advocacy were identified themes from the qualitative analysis, collaboration skills were found to be important in proportion of 70% of participants. Occupational therapists, with their somewhat extensive knowledge and experience, realize that no matter how much knowledge or experience they have, collaboration with other stakeholders involved with children with ND is an essential element to improve social inclusion. They understand that this element has a tremendous positive impact on the outcomes of social inclusion for children and that the fruit of this collective work is greater and beyond than what one individual's work can possibly accomplish (Villeneuve et al., 2013).

Based on the qualitative finding of the present study regarding the collaboration with stakeholders, mixed evidence from the literature is acknowledged. For instance, emergent themes from graduates in Hodgetts et al. (2007)'s study did not highlight collaboration as an element influencing the preparedness for practice of graduates whereas Nayar et al. (2013)'s study acknowledged that having strong communication skills is a facilitator of preparedness for practice. Additionally, Robertson and Griffiths (2009)' findings recognized the importance of this comparable theme to collaboration: communication. The primary message of their study was that graduates must feel confident in communicating with a wide range of people in varied contexts. This

included other health professionals, family and clients. Robertson and Griffiths (2009)' findings suggested that new graduates had many challenges in being able to communicate effectively. The scope of the present study did not encompass if longer-term graduates had difficulties with collaboration or communication with other parties, but results suggested that collaboration is a factor that contribute positively to the perception of competency of occupational therapists. Thus, this orientation is consistent and aligns with Robertson and Griffiths (2009) and Nayar et al. (2013) studies.

Implications for Occupational Therapy Education

Occupational therapy programs have the potential to make fundamental changes to improve the profession. Education of occupational therapy students is a key determinant which will influence greatly how they practice after graduation. The results of the present study propose several messages to occupational therapy educators, whether it is for entry-level or continuing education, on what may influence the perceived feeling of preparedness of students and practitioners.

First, educational programs should not underestimate the impact of the shortage of pediatric fieldwork placements. Universities should ensure that fieldwork opportunities with children with ND are available to all students. In order to maximize the opportunity of students, effort from educational institutions should be made to face this continuous challenge and find innovative solutions. Whether it is soliciting potential pediatric occupational therapists to become supervisors or grouping students during fieldwork experience, a multitude of solutions can be explored by curriculum committees. As fieldwork experience is commonly the primary source of experience provided by education programs, a close examination of current practice in curriculum is warranted.

In order to improve occupational therapy curriculum design and help students feel better prepared for practice, fieldwork education should be the focus of educators.

Second, beyond fieldwork experience, other options can be explored by educators to maximize the experience of students within the existing occupational therapy curriculum. For instance, encouraging and implementing modern teaching techniques involving technologies (e.g. videos, teleconference) or interactive learning (e.g. case scenarios, laboratories, homework requiring students to interact with a child) may be beneficial for the overall curriculum. An economic cost for institutions may be incurred to train adequately educators and obtain materials, but should positively contribute to the occupational therapy curriculum delivery. Finding creative and innovative educational ways to enhance the experience of students throughout occupational therapy programs would be an essential and key solution for curriculum developers.

Third, results from the study also recognized that occupational therapists have different perceptions in terms of education preparedness. During their professional career, practitioners are required to attend continuing education to maintain competencies. Findings indicated that factors such as knowledge and experience were not significantly correlated to perceptions of preparedness of occupational therapists. However, collaboration with stakeholders such as other health professionals was an important element contributing to their feeling of competency and preparedness. Further investigation regarding this factor is warranted, and continuing education providers should consider initiating strategies to support, promote and enhance collaboration between occupational therapy professionals and other stakeholders involve with children with ND. Interestingly, developing collaboration skills may not be uniquely an asset for

occupational therapy practitioners. Indeed, if occupational therapists judged that this factor is contributing to their feeling of competency, it is likely to be beneficial for occupational therapy students to develop further collaboration skills. A key role can be held by universities by increasing the cooperation between health faculties. Offering interprofessional education may be beneficial for occupational therapy programs. An alliance between faculties may fulfill substantially the collaboration need voiced by graduates. Even if occupational therapy students may have not yet recognized this need, this proactive strategy may be favorable for their preparedness later on. Further examination of this reflection is necessary, but worth consideration as it may add supplementary implications for occupational therapy education.

Implications for Occupational Therapy Practice

The results of the study revealed many implications for the occupational therapy pediatric practice. As experience is perceived by students as an element helping them gain confidence and feel competent, being able to promote rich and positive experience throughout the curriculum may facilitate their transition into practice. For instance, equipping students through fieldwork placement, encouraging volunteering (whether it is mandatory or not within curriculum) and capitalizing on students' previous job experience may all be options to exploit for education programs. These learning opportunities would help contribute later on to their professional development and enhance their practice. This can represent an important implication especially for new graduates. Since some skills are not easily learned outside practice environment, recognizing that experience gained in fieldwork and other experiential learning opportunities represent a valuable activator to learning on these elements may ease the

practice process for students after graduation. Being able to provide more satisfying experience for students can also possibly reduce the frustration of many recent graduates with respect to their sentiments of feeling incompetent and lacking technical skills and concrete intervention strategies, such as acknowledged by Hodgetts et al. (2007).

Results of the present study also provide insight for the practice of graduates in occupational therapy. As many clinical settings require occupational therapists to work autonomously along with other health professionals, families and school environments, having good collaboration skills represent a great advantage to enhance the outcomes of practice. For example, a good collaboration between occupational therapy practitioners and other professional team members would favour better role clarity and professional identity among the team. From a professional standpoint, a positive collaboration would likely promote the contributions of the profession. Furthermore, occupational therapy clinicians need to collaborate with different levels of management and also different organizations in order to justify decisions for resources to improve their clinical practice. For instance, a mutual collaboration between the practitioner and the manager needs to be established prior to demanding financing of equipment for the occupational therapy department or continuing education. Inherently, the profession of occupational therapy, as in any health professions, involves collaboration with a wide range of people in a variety of contexts. Being able to improve this skill can positively impact the day-to-day practice of clinicians.

Implications for Children with ND

The outcomes of the study have the potential to bring benefits to children with ND and their families. First, being able to increase the amount of experience of students with

children with ND would likely help them determine if they have an interest for this client group. Exploring hands-on interventions during fieldwork placements can orient the future career of students and guide their decision after graduation. Potentially, this can facilitate the retention of future occupational therapists in this specific area and in turn affects positively the workforce in pediatric occupational therapy. Although an addition of strategies is necessary to increase the numbers of pediatric occupational therapists, working towards this goal one strategy at a time would likely mean an increase in services for children with ND. More clients would receive occupational therapy interventions, which has the potential to improve their well-being and social inclusion. Furthermore, occupational therapists in pediatric practice can hold various roles and some of them can become difficult to fulfil without enough experience. For example, being in a consultative role for new graduates can be challenging without sufficient experience. While holding a consultative role requires occupational therapists to provide recommendations rather than implementing hands-on interventions, new graduates may feel that they are playing a guessing game if they have not experienced the implementation of practical interventions with a client group. In this case, experience gained through placements would greatly help them carry out recommendations if positioned in a consultative role early in their career and enable more rapidly the outcomes of children.

The services to children with ND provided by practitioners can also benefit from the implementation of the recommendations from this study. Recognizing the importance of collaboration skills for practicing clinicians can be advantageous for children. For instance, a good collaboration between occupational therapists and other key professional

stakeholders involved would develop clinical intervention continuity and create uniformity for children and their family. As a result, this collaboration between health professions should lead to less confusion and a better comprehension of interventions for parents, teachers and other stakeholders involve with children. In addition, empowering families to implement strategies at home necessitates collaboration skills from clinicians. Good collaboration skills with families would improve the quality of life of the child and likely of the whole family in the end. It will also ensure the sustainability of the strategies.

Limitations

As with any research, the present study has limitations. Given the ex post facto survey research, many challenges are associated with the use of existing data. A variety of limitations can be found in the research design, the sampling as well as the research tool.

Although using a survey was an appropriate research design for the present study, undertaking a secondary data analysis created some logistical flaws. First, as in any secondary data analysis, the investigator was constrained by how the data was collected and transcribed by the original research team. Thus, bias may have emerged from this constraint. Second, the time of completion of the survey for the students was perhaps not the best fit for the research question. Students would have probably given more informed responses if surveyed at the end rather than midway through their programs. It is difficult to specifically evaluate how much pediatric content they had received prior to completing the survey. Their responses to the survey may have differed if surveyed at the end of the program, assuming that they would have had potentially more pediatric content. Third, having professionals who had received an entry-level master's program similar to current

students would have improved uniformity of background education between groups, increased the comparability and perhaps reflects a more accurate profile between both groups. Given the growing complexities of healthcare services, Masters entry-level occupational therapy programs have been developed in recent years to equip students to face the evolving and multifaceted complexity present in healthcare practice. Since 2008, the mandatory Masters programs have increased the standards to reflect the reality of healthcare practice. There is hope that this education change will not only permit new graduates to survive to new healthcare environments, but also to thrive. Unfortunately, occupational therapists who completed undergraduate entry-to-practice programs before the venue of Masters entry-level programs did not benefit from this change, although experience and continuing education may have compensated to some extent. Thus, this factor may have affected the outcomes of the study. However, as Masters entry-level programs in occupational therapy have only been adopted recently, being able to recruit occupational therapists with a Master degree was difficult to achieve at the time of the survey completion in 2010 by occupational therapy practitioners. Despite the reality that using secondary data analysis has brought some challenges, it has provided an opportunity to answer a research question of relevance for occupational therapy and sustained the development of preliminary knowledge on the topic. For future studies, it would be recommended to conduct a full independent study in order to allow the researcher entire control over the data collection and management, to survey student respondents at the end of their program and to recruit graduate occupational therapists with Masters degrees in order to reduce study limitations.

Considering the convenience and purposive sampling methods chosen by the original research project, the participants who chose to participate may not be representative of all students or graduate occupational therapists. The geographic representation of participants is also a concern. Only two English universities in Canada participated to this study and occupational therapist respondents were recruited only through the Canadian Association of Occupational Therapists, in which membership is not mandatory for Canadian therapists, and were located in three provinces exclusively. This information related to sampling selection underpins the possibility that a volunteer bias may exist. Furthermore, no information about the non-respondents was available, but this was an accepted limitation for the present study. As university programs can vary widely in terms of amount and kinds of information and preparation gained in the pediatric area, limitations can be comprised in student sample. Overall, the samples selected may not be representative of all occupational therapy students and occupational therapists in Canada. Therefore, the sampling methods limit the generalization of the results. If at any possible time in the future, given the complexity of recruiting students and occupational therapists across Canada, it would be favorable for future studies to select a probability sampling technique in order to enhance the generalization of the results.

The instrument itself may also have caused some limitations in this study. Indeed, the researcher had no choice regarding the selection of the instrument. This suggests that variables of interest were perhaps not the perfect match for the instrument and this could potentially have led to measurement concerns. Undeniably, the instrument was not specially designed to measure the preparedness of occupational therapy students and clinicians. Questions were not specific to professional education and preparedness for

practice, thus results may be limited in these regards. Additionally, definitions were not provided to participants when completing the survey. As a result, specific terms such as "competency" may have influenced answers from participants and created inconsistency among results. On the whole, it is noted that the instrument had some limitations to fit perfectly the research endeavour of this study. For future research, it might be appropriate to use questionnaire targeting specifically education preparedness to work with children and to provide participants with a list of definitions in order to enhance uniformity among results by reducing as much as possible the subjectivity of participants.

Despite these limitations, the present study is one of the few among the occupational therapy literature, and a rare one in Canada, to provide knowledge around occupational therapy students and graduate occupational therapists preparedness to work with children with neurodevelopmental disabilities.

Opportunities for Future Research

Research is an ongoing obligation in health care and is warranted to justify a level of confidence from the public in the worth of the different health professions (Kielhofner, 2006). Moreover, research is the means by which a profession such as occupational therapy can generate foundational knowledge and evidence (Kielhofner, 2006). Since little occupational therapy literature about preparedness of students and graduates in Canada to practice with children with neurodevelopmental disabilities has been disseminated, the present research supports the development of some preliminary knowledge on the topic. Canadian occupational therapy programs should continue assessing the professional education program to ensure that changes are made based on stakeholder feedback to enhance preparedness for practice. The present study

investigated two different cohorts of students and a group of professionals. It would be interesting for future research to include a larger number of Canadian universities and to undertake longitudinal studies to follow students throughout programs and on to recent and longer-term experience. Being able to undergo such studies could possibly lead to important information about curriculum development and identify best practices. Further research is of necessity for the recognition and support of occupational therapy as it can assist educational programs that prepare occupational therapists (Kielhofner, 2006). As well, for the good of the profession and academic programs, expanding research on the preparedness of students and graduates to other areas of practice and populations seen in occupational therapy may reveal important to inform the different stakeholders and improve globally curriculum development in occupational therapy. Although it is important for occupational therapy programs to teach content that crosses different practice areas, the present research has shown the importance of experience with particular groups. Thus, maximizing the experience of students with groups they are likely to encounter in practice would seem to be a step in the right direction.

Conclusion

In recent years, the WHO has expanded working in the area of neurodevelopmental disorders in children and has mapped priorities worldwide (WHO, 2012). Increasing the health professional workforce is part of the WHO priorities. Occupational therapy is a profession situated in the healthcare team and can contribute to the well-being of young populations. In order to provide effective and competent services, occupational therapists are trained via university programs. Educators must use rigorous standards to educate students to become outstanding clinicians. The literature has flourished over the last

decade in the domain of education preparedness of students and graduates in occupational therapy in developed countries. However, a dearth in the examination of the perceptions of preparedness of students and graduates to work in specific areas of practice such as pediatrics was present. Therefore, this study investigated the perceptions of occupational therapy students and clinicians to practice with children with neurodevelopmental disorders, a population at rise in recent years.

This research is an encouraging step in growing Canadian evidence regarding the preparedness of occupational therapy students and graduates for practice with children with ND. Its outcomes support the evidence of former studies and confirm that the evidence can also apply to the pediatric domain. Students' results confirmed that experience is a decisive factor influencing their feeling of competency in pediatric practice whereas practitioners highlighted the importance of collaboration skills. These findings have inherent implications for occupational therapy education, practice and research. Innovative and creative solutions should be put forward by education programs to ensure best practices in curriculum development. Being able to improve occupational therapy programs will in turn enhance the practice of occupational therapists and the well-being and social inclusion of children with ND and their families.

Students and graduates offer valuable insights that can be used to enhance the profession of occupational therapy. Despite the challenges for university to attend all demands from stakeholders of interest, education committees should not underestimate the voice of its members. A continuing evaluation of occupational therapy programs is warranted to maintain the credibility and accountability of the profession. This research may assist key stakeholders in the occupational therapy education alliance about factors

affecting the feeling of competency of students and graduates in the pediatric area. This may potentially facilitate understanding and dialogue between educators, clinicians and students and assist in maximizing the development of competent entry-level health professionals.

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Appendix A: Profile of Practice of Occupational Therapists in Canada

(CAOT, 2012)

Appendix B: Essential Competencies of Practice for Occupational Therapists in Canada

(ACOTRO, 2012)

Units of Competence of Occupational Therapists

Units describe the major functions for effective performance of occupational therapists.

1. Assumes Professional Responsibility
2. Thinks Critically
3. Demonstrates Practice Knowledge
4. Utilizes an Occupational Therapy Process to Enable Occupation
5. Communicates and Collaborates Effectively
6. Engages in Professional Development
7. Manages Own Practice and Advocates within Systems

Appendix C: Information Letter for Healthcare and Education Professionals and Consent Form for Healthcare Professionals

CIHR Team HELPS Inc:
Health, Education and Learning Partnerships Promoting Social Inclusion of Children with Developmental Delays and Disabilities

APPENDIX I – Quantitative Study

Information Letter for Healthcare and Education Professionals

As a healthcare professional or educator working with children who have developmental delays or disabilities you are invited to participate in an exciting new research project about social inclusion of preschool-aged children with developmental delays or disabilities.

Who are we?

Our team includes parents, researchers and clinicians (including physicians, teachers, occupational therapists and psychologists) from Kingston and Toronto, Ontario; Montréal and Trois-Rivières, Québec; and Halifax, Nova Scotia. In Halifax, the primary investigator is Dr. Joan Versnel, who is an assistant Professor and Occupational Therapist in the Faculty of Health Professions at Dalhousie University.

What is this project about? Our major goals are to:

1. Describe the social inclusion of preschoolers with developmental delays or disabilities (DD) in educational social and recreational settings as they transition into school.

2. Identify the needs, challenges and successful actions of parents, professionals, healthcare and education students as they work to promote the social inclusion of preschoolers with developmental delays and disabilities during the transition into school.

3. Help parents, healthcare providers and educators communicate with each other and collaborate more effectively.

What will you be asked to do?

We will ask you to answer online a number of questions about your experiences meeting the needs of children with developmental delays or disabilities; your successes and challenges in promoting the healthcare, education and social inclusion of these children, and your experiences working with other professionals involved in working with children with

developmental delays or disabilities. The questionnaire will take approximately 20 minutes to complete. The HELPS Inc. project is anticipated to finish in 2012.

Possible Risks?

There are no anticipated risks to your participation in this study. You are not obliged to answer any questions you find objectionable and you are free to withdraw from the study. This study has been granted clearance according to the recommended principles of Canadian ethics guidelines and Dalhousie University policies.

How can you benefit if you agree to participate?

There are no direct benefits to you from your participation in this study. We hope that what we learn in this study will help educators and healthcare professionals to work closely with parents of children with developmental delays and disabilities to improve social inclusion.

How will your information be used and protected?

All information collected will be private and kept confidential. No one will see the answers you give to questions except members of the HELPS Inc research team. All information will be stored in a locked filing cabinet or on a secure computer in which files are password protected. A pseudonym will replace your name on all data that you provide to protect your identity. Your name will not be used in any of the reports or publications of our findings. No one will know that you participated or your answers to our questions.

How can you become part of the HELPS Inc project?

To participate please visit the HELPS Inc website: www.helpsinc.ca and complete the online survey.

For more information about the HELPS Inc project please contact Dr. Joan Versnel, Principal Investigator, Dalhousie School of Occupational Therapy, Halifax, Nova Scotia. (902) 494-8804, jversnel@dal.ca

CIHR Team HELPS Inc:
Health, Education and Learning Partnerships
Promoting Social Inclusion of Children with
Developmental Delays and Disabilities

Appendix I.1

Consent Form for Healthcare Professionals

My questions about this project have been answered and I understand that:

- I am not required to answer all of the questions
- All information will be kept confidential
- There are no particular risks if I participate
- I may withdraw from the project at any time without consequence
- Reports about the project's findings will not include my name

If I have any questions or concerns about this project, I may contact Dr. Joan Versnel, Principal Investigator at any time: (902) 494-8804 or jversnel@dal.ca.

If my questions or concerns are not answered, I may contact: Patricia Lindley, Director of Dalhousie University's Office of Human Research Ethics Administration for assistance, (902) 494-1462 or patricia.lindley@dal.ca.

CIHR Team HELPS Inc:
Health, Education and Learning Partnerships
Promoting Social Inclusion of Children with
Developmental Delays and Disabilities

I understand that by signing this consent form, I am agreeing to the following:

		Yes	No
►	I agree to complete a questionnaire online	☐	☐
►	I agree to be contacted in the future about participation in other studies that are related to this project	☐	☐
►	I agree for the data collected to be used for future related research studies	☐	☐

_____
Signature of healthcare professional

_____ _____
Print name Date

I can be reached by phone: HOME _____ WORK _____

E-mail :_____

My mailing address is:

_____
street address

_____ _____
town/city, province postal code

Appendix D: Healthcare Students Letter of Information and Healthcare Students Questionnaire

HELPS inc

Health, Education and Learning Partnerships Promoting Social Inclusion of Children with Developmental Delays and Disabilities

Partenariat Santé/Éducation pour l'inclusion des jeunes enfants présentant des difficultés développementales

APPENDIX J – Quantitative Study

Healthcare Students

Letter of Information

As a healthcare professional in training, you are invited to participate in this study.

Who are we? A team of researchers, healthcare professionals, educators, parents, students, and agencies from Kingston and Toronto, Ontario; Montreal and Trois Rivières, Québec; and Halifax, Nova Scotia

Why are we working together? We want to study:

1. the needs of preschoolers with developmental delays and disabilities as they start school;
2. ways of helping preschoolers actively participate not only in school but also in social and recreational activities with children with and without disabilities;
3. the needs and experiences of families of these preschoolers; and,
4. the needs and experiences of the professionals and healthcare and education students involved with these preschoolers.

What is this project about? HELPS Inc research will examine how parents, healthcare professionals and educators collaborate to help the transition into school of preschoolers with developmental delays and disabilities.

What will we ask you to do? We will ask you to answer questions about your knowledge and experiences regarding children with developmental delays and disabilities (both physical and intellectual). In addition, we will ask about your experiences and beliefs about inter-professional learning. You do not have to answer all questions if you don't want to. Also, you can discontinue your participation at any time without penalty.

How long will it take? The questionnaire will take approximately 15-20 minutes to complete.

How can you benefit if you agree to participate? The information we gather will be used to develop educational resources for parents, professionals, and students to help them work together to promote better social inclusion for children with developmental delays and disabilities.

How will your information be used? All information we collect will be private and kept confidential. No one will see the answers you give to questions except members of the HELPS Inc research team. All information will be stored in a locked filing cabinet.

For more information about the HELPS Inc project, please contact:

Dr. Joan Versnel, Dalhousie School of Occupational Therapy, Halifax, Nova Scotia, (902) 494-8804, jversnel@dal.ca or visit the HELPS Inc. website: www.helpsinc.ca

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My questions about this project have been answered and I understand that:

- I do not have to answer all of the questions
- My answers will be anonymous
- All information will be kept confidential and secure
- There are no particular risks if I participate
- I may withdraw from the project at any time without consequence
- I may keep this information letter about the HELPS Inc project

I understand that by completing the questionnaire, I am agreeing to participate in this project.

HELPS inc

Health, Education and Learning Partnerships Promoting Social Inclusion of Children with Developmental Delays and Disabilities

Partenariat Santé/Éducation pour l'inclusion des jeunes enfants présentant des difficultés développementales

Healthcare Student Questionnaire

Thank you for agreeing to participate in our research !

These questions will take approximately 15-20 minutes to complete.

CONSENT

By choosing to complete this questionnaire, I am agreeing to the following statement: I consent to participating in the HELPS Inc study focusing on: Health, Education and Learning Partnerships Promoting Social Inclusion of Children with Developmental Delays and Disabilities. I have read the Letter of Information, and my questions, if any, have been answered to my satisfaction. I confirm that I understand the provisions around confidentiality to protect my identity. I also understand that my participation is voluntary, and I have been told who to contact if I have questions/concerns about this study. I may keep the letter of information about this study for my records.

A. We would like to begin by asking a few questions about you.

A1. What gender are you? ☐ Male ☐ Female

A2. What is your age? _____ years

A3. What is your current program of study?

- ☐ Primary care physician (e.g., family physician, general practitioner)
- ☐ Medical specialist / consultant (e.g., pediatrician, psychiatrist)
- ☐ Nurse / Nurse-practitioner
- ☐ Psychologist
- ☐ Occupational therapist
- ☐ Physiotherapist
- ☐ Speech and language pathologist
- ☐ Social worker
- ☐ Genetic counselor
- ☐ Other: (please specify): _____

A4. What year of the program are you in?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6

A5. What is the anticipated date of completion for your program? (please indicate year) _____

	Degree / Qualification	*Educational Institution, City*	*Year of Completion*
A6. Which degrees and/or qualifications have you already completed?			

B. We would like to ask you some questions on your knowledge about developmental delays and disabilities.				
B1. How would you rate your current level of knowledge regarding the assessment / diagnosis of children with the following:	*Very limited*	*Limited*	*Moderate*	*Extensive*
1. Autism spectrum disorders	☐	☐	☐	☐
2. Down syndrome	☐	☐	☐	☐
3. Fragile X syndrome	☐	☐	☐	☐
4. Tourette syndrome	☐	☐	☐	☐
5. Fetal alcohol syndrome	☐	☐	☐	☐
6. Epilepsy	☐	☐	☐	☐
7. Non-specific intellectual disability	☐	☐	☐	☐
8. Developmental delay	☐	☐	☐	☐
9. Physical disabilities (e.g., cerebral palsy)	☐	☐	☐	☐
10. Hearing and/or visual difficulty	☐	☐	☐	☐
11. Other delay or disability (please specify): _____	☐	☐	☐	☐
B2. How would you rate your current level of knowledge regarding the treatment of children with the following:	*Very limited*	*Limited*	*Moderate*	*Extensive*
1. Autism spectrum disorders	☐	☐	☐	☐
2. Down syndrome	☐	☐	☐	☐
3. Fragile X syndrome	☐	☐	☐	☐
4. Tourette syndrome	☐	☐	☐	☐
5. Fetal alcohol syndrome	☐	☐	☐	☐
6. Epilepsy	☐	☐	☐	☐
7. Non-specific intellectual disability	☐	☐	☐	☐
8. Developmental delay	☐	☐	☐	☐
9. Physical disabilities (e.g., cerebral palsy)	☐	☐	☐	☐
10. Hearing and/or visual difficulty	☐	☐	☐	☐
11. Other delay or disability (please specify): _____	☐	☐	☐	☐

B3. Have you participated in any training sessions or workshops on any of the following topics:	*Undergraduate training*	*Postgraduate training*	*Other (please specify)*
1. Assessment / diagnosis of children with development delays or disabilities	☐	☐	☐ _____
2. Treatment of children with developmental delays or disabilities	☐	☐	☐ _____
3. Social inclusion of children with developmental delays or disabilities	☐	☐	☐ _____
4. Autism spectrum disorders	☐	☐	☐ _____
5. Down syndrome	☐	☐	☐ _____
6. Fragile X syndrome	☐	☐	☐ _____
7. Tourette syndrome	☐	☐	☐ _____
8. Fetal alcohol syndrome	☐	☐	☐ _____
9. Epilepsy	☐	☐	☐ _____
10. Non-specific intellectual disability	☐	☐	☐ _____
11. Developmental delay	☐	☐	☐ _____
12. Physical disabilities (e.g., cerebral palsy)	☐	☐	☐ _____
13. Hearing and/or visual difficulty	☐	☐	☐ _____
14. Other delay or disability (please specify): _____	☐	☐	☐ _____

B4. Overall, how helpful did you find the following for increasing your knowledge about developmental delays and disabilities?	*Not helpful*	*Moderately helpful*	*Very helpful*
1. Undergraduate training	☐	☐	☐
2. Postgraduate training	☐	☐	☐
3. Other	☐	☐	☐

B5. Do you have experience (work or volunteer) with children with the following developmental delays or disabilities? (choose all that apply)	*Very limited*	*Limited*	*Moderate*	*Extensive*
1. Autism spectrum disorders	☐	☐	☐	☐
2. Down syndrome	☐	☐	☐	☐
3. Fragile X syndrome	☐	☐	☐	☐
4. Tourette syndrome	☐	☐	☐	☐
5. Fetal alcohol syndrome	☐	☐	☐	☐
6. Epilepsy	☐	☐	☐	☐
7. Non-specific intellectual disability	☐	☐	☐	☐
8. Developmental delay	☐	☐	☐	☐
9. Physical disabilities (e.g., cerebral palsy)	☐	☐	☐	☐
10. Hearing and/or visual difficulty	☐	☐	☐	☐
11. Other delay or disability (please specify): _____	☐	☐	☐	☐

B6. Do you feel that you had enough access to information or resources to meet the needs of these children?

☐ Yes

☐ No B7. If not, what resources would be most helpful?

- ☐ Web-based material
- ☐ Written material (books, journal articles, etc.)
- ☐ Information obtained from workshops / training seminars
- ☐ Information obtained from colleagues
- ☐ Other (please specify) _____

	Not very competent	*Mildly competent*	*Moderately competent*	*Very competent*
B8. How competent do you feel in <u>collaborating</u> with different healthcare providers, educators, and other professionals?	☐	☐	☐	☐
	Not very competent (could meet few needs)	*Mildly competent (could meet some needs)*	*Moderately competent (could meet most needs well)*	*Very competent (could meet all needs expertly)*
B9. How competent do you feel in <u>meeting the needs</u> of children with developmental delays or disabilities?	☐	☐	☐	☐

C. We would like to ask you some questions about the actions you have taken in the <u>past year</u> to advocate for individuals with developmental delays or disabilities.

Have you participated in any of the following in the <u>past year</u>?			If YES, how many ?	Were these actions taken to meet the needs of a child in your care?	Were these actions taken to meet the needs of other individuals with developmental delays and disabilities?	Did your actions make a difference?
C1. made PHONE CALLS for advocacy	☐ No	☐ Yes	_____	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes ☐ Don't know
C2. made OFFICE VISITS (e.g., school, doctor, local government) or attended MEETINGS for advocacy	☐ No	☐ Yes	_____	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes ☐ Don't know
C3. helped with LETTERS OR MASS MAILINGS for advocacy	☐ No	☐ Yes	_____	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes ☐ Don't know
C4. had MEDIA CONTACTS for advocacy	☐ No	☐ Yes	_____	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes ☐ Don't know
C5. participated in OTHER ACTIVITIES for advocacy (please specify) _____	☐ No	☐ Yes	_____	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes ☐ Don't know

C6. Do you belong to any organizations or groups supporting children with developmental delays or disabilities?

☐ No

☐ Yes C7. If yes, how many organizations? _____

C8. What is your role in these groups? _____

D. We would like to ask you some questions about your experiences in meeting the needs of a child with a developmental delay and/or disability.

D1. Please give one example of a situation in which you felt particularly successful in meeting the needs of a child with a developmental delay or disability.

D2. Did your actions in this situation help to promote the social inclusion of this child? Social inclusion is a complex concept referring not only to a *place*, but also a *process* whereby students with developmental delays and disabilities have opportunities to participate with non-disabled peers in social, recreational, and educational settings.

☐ No
☐ Don't know
☐ Yes D3. If so, how?

D4. Please give one example of a situation in which you faced particular challenges in meeting the needs of a child with a developmental delay or disability.

D5. Did the challenges in this situation limit the social inclusion of this child?

☐ No
☐ Don't know
☐ Yes D6. If so, how?

E. We would like to ask you some questions about inter-professional learning, particularly as it applies to your work caring for persons with developmental delays and disabilities.

Please indicate whether you disagree or agree with the following statements.	*Strongly disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly agree*
E1. Learning with other students will help me become a more effective member of a healthcare team	☐	☐	☐	☐	☐
E2. Patients would ultimately benefit if healthcare students worked together to solve patient problems	☐	☐	☐	☐	☐
E3. Shared learning with other healthcare students will increase my ability to understand clinical problems	☐	☐	☐	☐	☐
E4. Learning with healthcare students before qualification would improve relationships after qualification	☐	☐	☐	☐	☐

	Strongly disagree	*Disagree*	*Neutral*	*Agree*	*Strongly agree*
E5. Communication skills should be learned with other healthcare students	☐	☐	☐	☐	☐
E6. Shared learning will help me to think positively about other professionals	☐	☐	☐	☐	☐
E7. For small group learning to work, students need to trust and respect each other	☐	☐	☐	☐	☐
E8. Team-working skills are essential for all healthcare students to learn	☐	☐	☐	☐	☐
E9. Shared learning will help me to understand my own limitations	☐	☐	☐	☐	☐
E10. I don't want to waste my time learning with other healthcare students	☐	☐	☐	☐	☐
E11. It is not necessary for undergraduate healthcare students to learn together	☐	☐	☐	☐	☐
E12. Clinical problem-solving skills can only be learned with students from my own department	☐	☐	☐	☐	☐
E13. Shared learning with other healthcare students will help me to communicate better with patients and other professionals	☐	☐	☐	☐	☐
E14. I would welcome the opportunity to work on small-group projects with other healthcare students	☐	☐	☐	☐	☐
E15. Shared learning will help to clarify the nature of patient problems	☐	☐	☐	☐	☐
E16. Shared learning before qualification will help me become a better team worker	☐	☐	☐	☐	☐
E17. The function of nurses and therapists is mainly to provide support for doctors	☐	☐	☐	☐	☐
E18. I'm not sure what my professional role will be	☐	☐	☐	☐	☐
E19. I have to acquire much more knowledge and skills than other healthcare students	☐	☐	☐	☐	☐

E20. Have you had experience (in class or on placement) working as part of an inter-professional team?

☐ No

☐ Yes E21. If yes, was this experience in the field of developmental delays and disabilities?

☐ Yes

☐ No (please specify), it was in the field of _____

Thank you for taking the time to complete the HELPS Inc survey!

Appendix E: Healthcare Professional Questionnaire

Healthcare Professional Questionnaire

Thank you for agreeing to participate in our research.

These questions will take approximately 10 minutes to complete.

Your answers will help us learn about the knowledge and experiences of healthcare professionals who care for children with developmental delays and disabilities (both physical and intellectual).

HELPS Inc research will examine how parents, healthcare professionals and educators collaborate to help the transition into school of preschoolers with developmental delays and disabilities.

The information we gather will be used to develop educational resources for parents and professionals to help them work together to promote better social inclusion for these children.

A. We would like to begin by asking a few questions about you.

A1. What gender are you? ☐ Male ☐ Female

A2. What is your age? _____ years

A3. What is your occupation?

- ☐ Primary care physician (e.g., family physician, general practitioner)
- ☐ Medical specialist / consultant (e.g., pediatrician, psychiatrist)
- ☐ Nurse / Nurse-practitioner
- ☐ Psychologist
- ☐ Occupational therapist
- ☐ Physiotherapist
- ☐ Speech and language pathologist
- ☐ Social worker
- ☐ Genetic counselor
- ☐ Other: (please specify): _____

A4. How long have you worked in your current occupation? _____ years

A5. What are the first three digits of your postal code? _____ _____ _____

B. We would like to ask you some questions on your knowledge about developmental delays and disabilities.

B1. How would you rate your current level of knowledge regarding the assessment / diagnosis of children with the following:	*Very limited*	*Limited*	*Moderate*	*Extensive*
	0	*1*	*2*	*3*
1. Autism spectrum disorders	☐	☐	☐	☐
2. Down syndrome	☐	☐	☐	☐
3. Fragile X syndrome	☐	☐	☐	☐
4. Tourette syndrome	☐	☐	☐	☐
5. Fetal alcohol syndrome	☐	☐	☐	☐
6. Epilepsy	☐	☐	☐	☐
7. Non-specific intellectual disability	☐	☐	☐	☐
8. Developmental delay	☐	☐	☐	☐
9. Physical disabilities (e.g., cerebral palsy)	☐	☐	☐	☐
10. Hearing and/or visual difficulty	☐	☐	☐	☐
11. Other delay or disability (please specify): _____	☐	☐	☐	☐

B2. How would you rate your current level of knowledge regarding the treatment of children with the following:	*Very limited*	*Limited*	*Moderate*	*Extensive*
	0	*1*	*2*	*3*
1. Autism spectrum disorders	☐	☐	☐	☐
2. Down syndrome	☐	☐	☐	☐
3. Fragile X syndrome	☐	☐	☐	☐
4. Tourette syndrome	☐	☐	☐	☐
5. Fetal alcohol syndrome				
6. Epilepsy	☐	☐	☐	☐
7. Non-specific intellectual disability	☐	☐	☐	☐
8. Developmental delay	☐	☐	☐	☐
9. Physical disabilities (e.g., cerebral palsy)	☐	☐	☐	☐
10. Hearing and/or visual difficulty	☐	☐	☐	☐
11. Other delay or disability (please specify): _____	☐	☐	☐	☐

B3. Have you participated in any training sessions or workshops on any of the following topics:	*undergraduate training*	*postgraduate training*	*continuing professional development courses*
1. Assessment / diagnosis of children with developmental delays or disabilities	☐	☐	☐
2. Treatment of children with developmental delays or disabilities	☐	☐	☐
3. Social inclusion of children with developmental delays or disabilities	☐	☐	☐
4. Autism spectrum disorders	☐	☐	☐
5. Down syndrome	☐	☐	☐
6. Fragile X syndrome	☐	☐	☐
7. Tourette syndrome	☐	☐	☐
8. Fetal alcohol syndrome			
9. Epilepsy	☐	☐	☐
10. Non-specific intellectual disability	☐	☐	☐
11. Developmental delay	☐	☐	☐
12. Physical disabilities (e.g., cerebral palsy)	☐	☐	☐
13. Hearing and/or visual difficulty	☐	☐	☐
14. Other delay or disability (please specify): _____	☐	☐	☐

B4. Overall, how helpful did you find the following for increasing your knowledge about developmental delays and disabilities?	*Not applicable*	*Not helpful*	*Moderately helpful*	*Very helpful*
		1	*2*	*3*
1. undergraduate training	☐	☐	☐	☐
2. postgraduate training	☐	☐	☐	☐
3. continuing professional development courses	☐	☐	☐	☐

B5. Do you have experience in your practice caring for children with the following developmental delays or disabilities?	*Very limited*	*Limited*	*Moderate*	*Extensive*
	0	*1*	*2*	*3*
1. Autism spectrum disorders	☐	☐	☐	☐
2. Down syndrome	☐	☐	☐	☐
3. Fragile X syndrome	☐	☐	☐	☐
4. Tourette syndrome	☐	☐	☐	☐
5. Fetal alcohol syndrome				
6. Epilepsy	☐	☐	☐	☐
7. Non-specific intellectual disability	☐	☐	☐	☐
8. Developmental delay	☐	☐	☐	☐
9. Physical disabilities (e.g., cerebral palsy)	☐	☐	☐	☐
10. Hearing and/or visual difficulty	☐	☐	☐	☐
11. Other delay or disability (please specify): _____	☐	☐	☐	☐

B6. Did you feel that you had enough access to information or resources to meet the needs of these children?

☐ No ☐ Yes

B7. What resources are or would be most helpful? (choose all that apply)

- ☐ Web-based material
- ☐ Written material (books, journal articles, etc.)
- ☐ Information obtained from workshops / training seminars
- ☐ Information obtained from colleagues
- ☐ Other (please specify) _____

B8. Do you work as part of an inter-professional team?

☐ No

☐ Yes

B9. If yes, what other professionals in your practice are involved in the care of children with developmental delays or disabilities? (choose all that apply)

- ☐ Primary care physician (e.g., family physician, general practitioner)
- ☐ Medical specialist / consultant (e.g., pediatrician, psychiatrist)
- ☐ Nurse / Nurse-practitioner
- ☐ Psychologist
- ☐ Occupational therapist
- ☐ Physiotherapist
- ☐ Speech and language pathologist
- ☐ Social worker
- ☐ Genetic counselor
- ☐ Other: (please specify): _____

B10. How competent do you feel in collaborating with others about children with developmental delays and disabilities:				
	Not very competent	*Mildly competent*	*Moderately competent*	*Very competent*
• other healthcare providers	☐	☐	☐	☐
• educators	☐	☐	☐	☐
• parents	☐	☐	☐	☐
	Not very competent (could meet few needs)	*Mildly competent (could meet some needs)*	*Moderately competent (could meet most needs well)*	*Very competent (could meet all needs expertly)*
B11. How competent do you feel in meeting the needs of children with developmental delays or disabilities?	☐	☐	☐	☐

C. We would like to ask you some questions about the actions you have taken in the past year to advocate for individuals with developmental delays or disabilities.

Have you participated in any of the following in the past year?			If YES, how many?	Were these actions taken to meet the needs of a child in your care?	Were these actions taken to meet the needs of other individuals with developmental delays and disabilities?	Did your actions make a difference?
C1. made PHONE CALLS for advocacy	☐ No ► go to C2	☐ Yes	_____	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes ☐ Don't know
C2. made OFFICE VISITS (e.g., school, doctor, local government) or attended MEETINGS for advocacy	☐ No ► go to C3	☐ Yes	_____	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes ☐ Don't know
C3. helped with LETTERS OR MASS MAILINGS for advocacy	☐ No ► go to C4	☐ Yes	_____	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes ☐ Don't know
C4. had MEDIA CONTACTS for advocacy	☐ No ► go to C5	☐ Yes	_____	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes ☐ Don't know
C5. participated in OTHER ACTIVITIES for advocacy (please specify) _____	☐ No ► go to C6	☐ Yes	_____	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes ☐ Don't know

C6. Do you belong to any organizations or groups supporting children with developmental delays or disabilities?

☐ 1. No

☐ 2. Yes C7. If yes, how many organizations? _____

C8. What is your role in these groups? _____

D. We would like to ask you some questions about your experiences in meeting the needs of a child with a developmental delay or disability.

D1. Please give one example of a situation in which you felt particularly successful in meeting the needs of a child with a developmental delay or disability.

D2. Did your actions in this situation help to promote the social inclusion of this child? Social inclusion is a complex concept referring not only to a *place*, but also a *process* whereby children with developmental delays and disabilities have opportunities to participate with non-disabled peers in social, recreational, and educational settings.

☐ No

☐ Don't know

☐ Yes D3. If so, how?

D4. Please give one example of a situation in which you faced particular challenges in meeting the needs of a child with a developmental delay or disability.

D5. Did the challenges in this situation limit the social inclusion of this child?

☐ No

☐ Don't know

☐ Yes D6. If so, how?

Thank you for taking the time to complete the HELPS Inc survey.

Appendix F: McGill Inclusive Education Questionnaire

McGill Inclusive Education Questionnaire

Survey designed for professionals, paraprofessionals and volunteers who work in an inclusive setting.

The following information will remain completely confidential. Please read each question carefully and fill out the survey accordingly. Note: this survey will take no more than 15 minutes.

A. Demographics

A1 **Gender:**

- *Male* ☐
- *Female* ☐

A2 **Age Group:**

- *20-25* ☐
- *26-35* ☐
- *36-45* ☐
- *46 +* ☐

A3 **Number of years working as an educator:**

_____

_____

A5 **Number of years working in special education:**

_____

_____

A4 **Number of years working in inclusive classrooms:**

_____

_____

A6 **Degrees obtained? (Please check all that applies)**

- *High school* ☐
- *CEGEP* ☐
- *Undergraduate or Bachelor's Degree* ☐

- *B.Ed* ☐
- *Inclusive Education Certificate* ☐
- *Masters* ☐
- *Doctorate* ☐
- *Other certificate/diploma (please specify)*

_____

_____

A7 **School Board Affiliation:**

- *Eastern Shore School Board* ☐
- *Eastern Township School Board* ☐
- *English Montreal School Board* ☐
- *Central Quebec School Board* ☐
- *Lester B. Pearson School Board* ☐
- *New Frontiers School Board* ☐
- *Riverside School Board* ☐
- *Sir Wilfred Laurier School Board* ☐
- *Western Quebec School Board* ☐
- *Other (please specify)*

_____

_____

A8 **Please indicate your position within your working context. Please check all that apply. If you check more than one context, please indicate the percentage of time you spend in each context.**

- *Teacher* ☐
- *Child Care worker* ☐
- *Special ed technician* ☐
- *Social aid technician* ☐
- *Speech pathologist* ☐
- *School administrator* ☐
- *Resource specialist* ☐
- *Psychologist* ☐
- *Special needs consultant* ☐
- *Integration aide, attendant* ☐
- *Guidance counsellor* ☐
- *Preposé* ☐
- *School admin staff* ☐
- *Other (please specify)* _____

B. Professional Development of Educators in an Inclusive Setting

B1 **Does your School Board currently offer in-servicing on students with special needs within an inclusive setting?**

- *Yes, currently offering in servicing for special needs students* ☐
- *No, not currently but has in the past 2 years* ☐
- *Don't know* ☐

B2 **Who is responsible for the professional development of educators in your jurisdiction? Please check all that apply.**

- *The MELS (formally known as the MEQ)* ☐
- *The School Board coordinator or equivalent* ☐
- *The School* ☐
- *Don't know* ☐

B3 **Has your school held any in-servicing workshops on special needs students for the non-teaching staff (e.g. secretaries, child care workers, psychologists etc.) If no, or don't know go to B5?**

- *Yes, workshop leaders have presented at our school* ☐
- *Yes. we have attended workshops as a staff at other schools* ☐
- *No, never* ☐
- *Don't know* ☐

B3_1 **Did these workshops focus specifically on inclusive classrooms?**

- *Yes* ☐
- *No* ☐

B4 **Which types of workshops were offered (Select the one that best applies)?**

- *Mandatory workshops* ☐
- *Workshops on a voluntary basis* ☐

B5 **In the past two years have you attended any professional development courses in the area of Special Education within inclusive classrooms? If no, move to question B6.**

- *No* ☐
- *Yes (please specify)*_____ ☐

B5_1 **If yes, to what extent do you feel these courses were beneficial to you within an inclusive setting?**

- *Very helpful* ☐
- *Moderately helpful* ☐
- *Not helpful at all* ☐

B6 **Have you attended any workshops that were designed to learn about these following topics (check all that applies)? H=handicap, AR= At Risk**

- *Attention Deficit Hyperactive Disorder (AR)* ☐
- *Autism Spectrum (H)Language Disorders (H)* ☐
- *Down Syndrome (H)* ☐
- *Fragile X syndrome (H)* ☐
- *Tourettes Syndrome (H)* ☐
- *Language Disorders (H)* ☐
- *Learning Disabilities (AR)* ☐
- *Non Specific Intellectual or Developmental Delay (AR)* ☐
- *Physical Disabilities (H)* ☐
- *Hearing and or Visual Difficulty (H)* ☐
- *Other (please specify)* _____

B7 **Were the workshops that you attended primarily designed to learn strategies in assisting students_____in the inclusive classroom (check all that apply).**

- *with varying learning styles* ☐
- *with attention difficulties* ☐
- *with emotional needs* ☐
- *with behavioural needs/difficulties* ☐
- *according to their multiple intelligence* ☐
- *Other (please specify)* _____

C. Student Populations and Strategies

C1 **What kinds of disabilities do the children <u>you are currently working</u> with have ? (Please specify all that apply).**

- *Attention Deficit Hyperactivity Disorder* ☐
- *Autism Spectrum Disorder* ☐
- *Down Syndrome* ☐
- *Fragile X Syndrome* ☐
- *Hearing and or Visual Difficulty* ☐
- *Language Disorders* ☐
- *Learning Disabilities* ☐
- *Non Specific Intellectual or Developmental Disorder* ☐
- *Physical Disabilities* ☐
- *Tourettes Syndrome* ☐

C2 **For which of the following have you designed or implemented a specific program (i.e. an organized set of activities linked directly to the specific needs of a child's disability).**

- *Attention Deficit Hyperactivity Disorder* ☐
- *Autism Spectrum Disorder* ☐
- *Down Syndrome* ☐
- *Fragile X Syndrome* ☐
- *Hearing and or Visual Difficulty* ☐
- *Language Disorders* ☐
- *Learning Disabilities* ☐
- *Non Specific Intellectual or Developmental Disorder* ☐
- *Physical Disabilities* ☐
- *Tourettes Syndrome* ☐
- *Other (please specify)* _____

C3 **Did you feel you had enough information or easy access to resources in designing/implementing these specific programs?**

- *Yes* ☐
- *No* ☐
- *N/A* ☐

C4 **In designing these specific programs what resource(s) did you use or have access to (check all that apply)?**

- *Web based material* ☐
- *Written material (books, journal articles etc.)* ☐
- *Information obtained from workshops/training seminars* ☐
- *Information obtained from consultation meetings* ☐
- *Information obtained from colleagues* ☐
- *Other (please specify):* _____

C5 **What proved to be the most useful resource to you?**

- *Web based material* ☐
- *Written material (books, journal articles etc.)* ☐
- *Information obtained from workshops/training seminars* ☐
- *Information obtained from consultants* ☐
- *Other (please specify):* _____

C6 **Which staff members have participated in developing, organizing and implementing strategies and modifications to meet the needs of students diagnosed with developmental disabilities? (Check all that applies)**

- *Teachers* ☐
- *Psychologists* ☐
- *Resource Teachers* ☐
- *Special Ed. Consultants* ☐
- *Administrators* ☐
- *Speech and Language Consultants* ☐
- *Child Care Workers* ☐
- *Social Workers* ☐
- *Don't know* ☐
- *Other (please specify e.g. MEQ consultants, university based consultants)* _____

C7 **Did these specific strategies recognize the unique profiles of differing developmental disabilities?**

- *Yes* ☐
- *No* ☐
- *Don't know* ☐

C8 **If you had some questions regarding a child with a developmental disability in your school, indicate to whom you would most likely go for help.**

- *Teachers* ☐
- *Resource Teachers* ☐
- *Administrators* ☐
- *Child Care Workers* ☐
- *Psychologists* ☐
- *Special Needs Consultants* ☐
- *Speech and Language Pathologists* ☐
- *Social Workers* ☐
- *Guidance Counsellors* ☐
- *Others (please specify)* _____

C9 **How do you rate your current level of knowledge in working with the following students with _____?**

	High	*Moderate*	*Low*	*Very Low*
Attention Deficit Hyperactivity Disorder	☐	☐	☐	☐
Autism Spectrum Disorder	☐	☐	☐	☐
Down Syndrome	☐	☐	☐	☐
Fragile X Syndrome	☐	☐	☐	☐
Hearing or Visual Difficulty	☐	☐	☐	☐
Language Disorder	☐	☐	☐	☐
Learning Disability	☐	☐	☐	☐
Non specific intellectual or Developmental Delay	☐	☐	☐	☐
Physical Disabilities	☐	☐	☐	☐
Tourettes Syndrome	☐	☐	☐	☐

C10 **How would an increase in knowledge about different developmental disabilities impact your effectiveness in working with children in the inclusive classroom?**

Significant Impact ..... ☐
Moderate Impact ..... ☐
No Impact ..... ☐

C11 **In what areas would you like more training and/or education when teaching students with different developmental disabilities? (Please check all that applies).**

	Yes	*No*
Classroom Management	☐	☐
Behaviour Interventions	☐	☐
Social Skills	☐	☐
Language Skills	☐	☐
Academic Modifications	☐	☐
Fine/Gross Motor Skills	☐	☐
Memory	☐	☐
Sensory	☐	☐

D. Further Comments and Suggestions

D1 **In your opinion, what are the challenges your school is experiencing by integrating students with developmental disabilities in the classroom (Please check all that apply)?**

Difficulty managing the classroom ..... ☐
Difficulty implementing an IEP ..... ☐
Negative staffs attitudes towards children with developmental disabilities ..... ☐
Difficulty increasing interaction with typical and atypical children ..... ☐
Lack of support from staff members (e.g. psychologists, resource teachers) ..... ☐
Lack of resource materials and/or early intervention tools ..... ☐
Lack of funds to implement specialized programs for students with developmental disabilities ..... ☐
Lack of funds to implement specialized workshops and courses for staff who work in an inclusive setting ..... ☐
None of the above ..... ☐
Other (please specify): _____

D2 **In your opinion, what are the successes your school is experiencing by integrating students with differing developmental disabilities in the classroom (Please check all that apply)?**

Students with developmental disabilities have the ability to model and interact with typical children within a regular classroom setting ..... ☐
There is an increase acceptance,compassion and awareness of children with a developmental disability among the typical students ..... ☐

There is an increase acceptance,compassion and awareness of children with a developmental disability among the staff who work within an inclusive setting ☐
Inclusive settings promote collaboration and partnerships with parents and other caregivers ☐
None of the above ☐
Other (please specify): _____

D3 **If any, what stressors are you experiencing working in an inclusive setting (Please check all that apply)?**
Perceived lack of parental understanding of their child's capabilities ☐
The need to sustain an active learning environment for all students within an inclusive classroom ☐
Being accountable for all students educational outcomes ☐
Developing an IEP to meet the many needs of a student with a developmental disability ☐
Obtaining funding to support the needs of students with a developmental disability ☐
Working with a student who has a poor attention span ☐
Working with a student who has inappropriate social behaviours ☐
Other (please specify): _____

D4 **What kinds of specialized curriculum and classroom resources do educators have access to in your school?**
Specialized computer software ☐
Manipulatives ☐
Specialized books ☐
Specialized visual material ☐
Other specialized materials ☐
Adaptive Equipment ☐
No specialized material ☐

D5 **Are there resource teachers assigned to each school to assist the learning process of students with differing developmental disabilities?**
Yes ☐
No ☐

D6 **How often does the resource teacher meet with other educators?**
Daily ☐
Weekly ☐
Monthly ☐
Never ☐
N/A ☐

D7 **Do you or have you ever co-taught a class with a resource teacher?**
Yes ☐
No ☐
N/A ☐

D8 **If you are a resource teacher, have you ever or do you presently teach a class with another teacher?**
Yes ☐
No ☐
N/A ☐

D9 **Are you responsible for developing and implementing the individual education plans (IEP) for the students that you teach?**
Yes ☐
No ☐
N/A ☐

D10 **Are you a part of a resource team (team responsible for the education, treatment, and planning for students with special needs)? If yes, who is part of that team?**

- *Principal* ☐
- *Vice-principal* ☐
- *Resource teacher* ☐
- *Psychologist* ☐
- *Speech and Language pathologist* ☐
- *Child-care worker, shadow, or integration aide* ☐
- *School board consultant* ☐
- *Parent* ☐
- *No, not a part of a resource team* ☐
- *Other (please specify)* _____

D11 **How often does your resource team meet?**

- *Daily* ☐
- *Weekly* ☐
- *Monthly* ☐
- *Never* ☐
- *N/A* ☐

D12 **What factors are <u>not</u> currently in place that you think will help facilitate inclusion into regular classrooms?**

_____

D13 **What resources do you think needs to be available in order for you to feel confident to teach or work in an inclusive classroom?**

_____

D14 **Would you be interested in participating in a future discussion concerning inclusion and how to facilitate inclusive education. If yes, please provide your contact information (name, e-mail, number)**

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Thank you for your participation.