Primary/Junior Pre-Service Teachers’ Knowledge, Attitudes, and Perceptions of Including
Students with ADHD in General Education Classrooms: A Mixed-Method Study

By

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A thesis submitted to the Faculty of Education
in conformity with the requirements for
the degree of Master of Education

Queen’s University
Kingston, Ontario, Canada
July 26th, 2017

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ABSTRACT

Negative attitudes towards students with Attention Deficit Hyperactivity Disorder (ADHD) are a lingering challenge in the education system. It is important to examine pre-service teachers’ perceptions of ADHD in an educational setting due to the influential roles of teachers on students. Pre-service teachers’ knowledge and attitudes, as well as their perceptions of ADHD, have powerful influences on the ways in which teachers’ pedagogical decisions affect their interactions and relationships with students. The purpose of the study was to explore pre-service teachers’ knowledge of ADHD and their attitudes and perceptions towards including ADHD in the general classroom. The purpose of this study was informed by two research questions: Do coursework and practicum experience influence pre-service teachers’ knowledge, attitudes, and perceptions of including students with ADHD in the general education classroom? What underlies a change in pre-service teachers’ knowledge, attitudes, and perceptions of including students with ADHD in the general education classroom? A mixed-method study was conducted using a sequential explanatory design, examining 28 primary/junior pre-service teachers from a university, in a city in Ontario. Pre-test and post-test data were collected through questionnaires, responses to vignettes, and in-depth individual interviews. Questionnaire analysis indicated four significant differences from time 1 to time 2. Three individual interviews were conducted; overall pre-service teachers had positive attitudes towards students with ADHD, but lacked content knowledge and felt there were weaknesses in their knowledge due to their teacher education program design. This study provides an in-depth understanding of pre-service teachers’ knowledge, attitudes (what they think or feel) and perceptions (their understanding or interpretation) of students with ADHD. Findings of this study could be of interest to Ontario curriculum developers, policy makers, teacher educators, and practicing teachers.
AUTOBIOGRAPHICAL SIGNATURE

Intelligent, energetic, passionate, humorous, loving; these are all characteristics of my younger brother. At the age of 7 years, my brother was diagnosed with ADHD. ADHD was a diagnosis that would change our family’s life. As I grew older, I continuously watched my brother be shamed, ostracized, and bullied by both staff and students in his school. The message that he was not worthy, he was not smart, and he was not capable, soon became engrained in my brother through the various teachers and classmates he had. Behind the label, he was still a child who deserved to be given the same positive messages his classmates were told. My pursuit of a Masters degree in Education stemmed from the need to gain insight into how teachers perceive ADHD, what external or internal factors influence their perception, and what can be done at the pre-service level so that educators see ADHD through a more positive lens?
ACKNOWLEDGEMENTS

I first and foremost want to thank my parents, Linda and Doug. You two have been my rock throughout this process. Your constant emotional support allowed me to get over the many bumps I faced along the way. Whether it was the many phone calls, need for reassurance, or simply just to share my ‘ah-ha’ moments with, I could not have done this without you. Thank you for constantly encouraging me to challenge myself, being by my side to prove the critics wrong, and for instilling in me that if I work hard, anything is possible. Thank you for working so, so, so hard to be able to send me to university multiple times (I swear I’m done now), and for making sure that all the doors I wanted were always open for me; I am eternally grateful. This degree is just as much yours as it is mine; I hope I made you proud. I love you both to the moon and back. To my little brother Kevin, this was for you. I want you to always remember how capable you are, and that the only person getting in your way of your future success is you. And in case you forget, I will always be there to remind you. You were my inspiration these past two years. I hope I made you proud, too; I love you!

To my friends both at Queen’s and at home, I want to thank you for supporting me through the tough times and celebrating with me through the good. I want to thank you for your understanding and encouragement in my many, many moments of crisis. I could not have done this without you! I want to thank my colleagues, for sharing with me the good, the bad, and the ugly. Knowing we were in this together made all the difference! The community at Queen’s University was like no other, and I could not have imagined doing this program anywhere else.

This thesis would not have been possible without the hard work, patience, and support of my thesis supervisor, Dr. Derek Berg. I had never thought I was capable of pursuing a graduate degree, until you approached me three years ago in your B.Ed. class and you showed me how much you believed in me. I want to thank-you for helping me realize my potential and for being
patient while I figured things out along the way. You have been such a great teacher, mentor, and friend to me over the past three years. I would also like to thank Dr. Jamie Pyper for providing me with his guidance and direction throughout this process.

I would also like to thank the pre-service teachers that chose to take part in this study. I was extremely lucky to have participants who were cooperative and passionate about this topic!

This thesis is just the beginning for me and I cannot wait to see what the future holds!
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CHAPTER 1
INTRODUCTION

Over the past two decades, there has been a prioritized shift in Ontario’s policy platform from traditional separate special education classrooms to a more inclusive holistic approach (Thompson, Lyons, & Timmons, 2014). In the inclusive classroom, the approach is that all students are given the opportunity to benefit from instruction, while also being provided the necessary resources to excel in the general classroom setting (Thompson et al., 2014). Each province in Canada has control over the direction and structure of their educational system.

Because of the provincial control, we often see differences in special education policy and practice across provinces and territories (Hutchinson et al., 2001); the lack of consistency across provinces when implementing inclusive education can make it difficult for general education teachers to support students with exceptionalities in the classroom. This lack of consistency may also be seen within provinces. While the ministries and departments of education within the provinces make the inclusive policies that the boards must follow, school boards do have some discretion in their practice of inclusion.

The recent widespread practice of inclusion in the general education classroom has established urgency for reform in teacher education (Ajuwon et al., 2012). Today's general classroom educators are increasingly confronted with students who exhibit emotional and behavioural problems, more than any other disability group (besides learning disabilities) (Ajuwon et al., 2012). ADHD occurs in approximately 3 to 6% of the childhood population (Cantwell, 1996); most of these children with ADHD are placed in general education classrooms. It is essential that we examine how pre-service teachers perceive their learning experience in their teacher preparation program and the content and instructional knowledge they receive on ADHD,
knowing that these teachers will likely teach children with ADHD in their general education classrooms.

**Purpose of the Study**

Teachers’ knowledge and attitudes, as well as their perceptions, have powerful influences on the ways in which teachers’ pedagogical decisions affect interactions and relationships with students (Ohan, Cormier, Hepp, Visser, & Strain, 2008). Studies show that teachers’ behaviour is a reflection of their attitudes on a variety of issues and topics (Kos, Richadale, & Hay, 2006). While most teachers are aware of ADHD, the majority of in-service teachers have received little training and instruction on ADHD and how it can affect their classroom (Stormont, 2001). Although students with ADHD are taught predominantly in general education classrooms (Schnoes, Reid, Wagner, & Marder, 2006), current findings suggest that many general education teachers lack training in ADHD (Stormont, 2001). That is, 89% of elementary school teachers reported that they had no instruction on ADHD during their Bachelor of Education, and 92% had only a little training on ADHD after graduation (Stormont, 2001). The purpose of the study is to examine pre-service teachers’ knowledge, attitudes, and perceptions of including students with ADHD in the general education classroom.

The study is informed by two research questions:

1. Do coursework and practicum experience influence pre-service teachers’ knowledge, attitudes, and perceptions of including students with ADHD in the general education classroom?

2. What underlies a change in pre-service teachers’ knowledge, attitudes, and perceptions of including students with ADHD in the general education classroom?
Rationale for the Study

ADHD and ADHD-type behaviours are most often present in the early school years and are dominant throughout primary and secondary schooling, with an average of one child per general education classroom having ADHD (Barkley, 1998). Primary teachers, therefore, are most likely to interact with students’ diagnosed with ADHD, as well as being among the first to notice ADHD-type behaviours in children (Tannock & Martinuseen, 2001). Many studies have looked at in-service teachers’ knowledge of ADHD, including the causes, interventional strategies, and behavioural manifestations (Mulholland, Cumming & Jung, 2015). A vast amount of the literature is focused on the knowledge of ADHD, and teachers’ perceptions of ADHD as a diagnosis (Mulholland et al., 2015). However, there are few studies that delve into the feelings, beliefs, and perceptions that teachers hold about ADHD-type behaviours and other students that exhibit these behaviours, whether diagnosed or not diagnosed (Mulholland et al., 2015). It is well documented that there is a link between teacher attitudes and behaviours (Kos et al., 2006), and in particular, that teachers’ knowledge of, and attitudes towards, ADHD influences their resultant behaviour (Glass & Wegar, 2000). Studies suggest that general education in-service teachers who have lower levels of knowledge of ADHD may hold different views of students with ADHD than those teachers who have more extensive knowledge of ADHD (Vereb & DiPerna, 2004). The limited research on teacher interactions with students with hyperactivity has documented that teachers are also more negative when interacting with children with hyperactivity, which may further influence the way teachers interact with the entire class (Stormont, 2001). This negativity may be offset, at least in part, by increasing teachers knowledge related to the characteristics of students with ADHD and the associated challenges with ADHD-type behavior (Stormont, 2001).

Studies show that in-service teachers, including those with special education backgrounds, lack an adequate level of knowledge of ADHD, feel unequipped to teach students
with ADHD effectively, and feel that they have not received an adequate level of professional development regarding ADHD (Mulholland et al., 2015). Teachers feel pressure to maintain order and facilitate the learning of students with ADHD without adequate training (Atkinson, Robinson, & Shute, 1997; Mahar & Chalmers, 2007; Ohan et al., 2008). In-service teachers feel they are not equipped to work with students with ADHD; however, children with ADHD are being placed in the general education classrooms regardless. The lack of knowledge and professional development regarding ADHD for in-service teachers could suggest that they were not adequately prepared during their teacher education program to teach students with ADHD in the general education classroom. This lack of training reported by in-service teachers on ADHD in the literature supports the need to examine pre-service teachers’ knowledge of ADHD. Instead of educating in-service teachers through interventional professional development, it may be more helpful to improve the educational experiences of those at the pre-service level through more extensive coursework, exceptionality focused course content and practicum experience.

The literature has largely omitted any focus on pre-service teachers’ perceptions about and knowledge of ADHD, as well as their attitudes towards students with ADHD. Instead, most of the current literature focuses on in-service teachers’ knowledge and attitudes. Studies that do exist suggest that once strong attitudes are developed, they become more resistant to opposing viewpoints; in turn, leaving these strong attitudes to have a greater influence on thought process and behaviours (Anderson et al., 2012). If teacher education programs do not address pre-service teachers’ attitudes towards students with ADHD, pre-service teachers may become dependent on in-service professional development for ADHD. Additionally, if the pre-service teachers develop negative attitudes towards students with ADHD, then in-service professional development may be ineffective in restricting problematic attitudes and perceptions. Researchers have argued that pre-service education would be the optimal time to address pre-service teachers’ concerns and
begin to change any negative attitudes towards inclusive education or exceptionalities in general (Forlin, et al., 2009; Harvey, Yssel, Bauserman, & Merblr, 2010).

Due to in-service teachers reported feelings of being unequipped to work with students with ADHD (Mulholland et al., 2015), there is a demonstrable need for teachers to be educated while still in their pre-service teacher program. By doing so, these teacher candidates will be better prepared to work with and teach students with ADHD once they transition and become in-service teachers. In order to better position pre-service teachers for teaching students with ADHD, this study will examine pre-service teachers knowledge, attitudes, and perceptions of students with ADHD, pre- and post-practicum and coursework experience, to see if their knowledge, attitudes, and perceptions change after completing initial experiences in these components of their Bachelor of Education program (B.Ed.). With the B.Ed. programs in Ontario recently moving to a 4-term model, pre-service teachers receive more practicum experience as well as the opportunity to learn more about exceptionalities through coursework.
CHAPTER 2
THEORETICAL FRAMEWORK AND LITERATURE REVIEW

In this chapter, I will discuss locus of control, which is one of the theoretical lenses that framed this study. As well, teachers’ content knowledge will be discussed, which is a construct that was used as a second pillar to the theoretical framework of this study. Literature related to teachers’ (in-service and pre-service) knowledge of and attitudes towards children with ADHD and children who exhibit ADHD-type behaviour in the classroom were also examined. Topics of this literature review will include special education and inclusion in Ontario, ADHD in the classroom and the teacher’s role within the classroom, and mental health and possible associated stigma. This literature review will also explore how teachers’ attitudes about and knowledge of ADHD may impact classroom experiences for students with ADHD. Most literature available concerns in-service teachers; pre-service teachers’ perception of ADHD, including their knowledge and attitudes is a relatively new field with little research available.

Theoretical framework

Locus of control

Locus of control, as identified by Rotter (1966), is the main theoretical lens that frames this study through an individual’s internal and external locus of control. Locus of control stems from the idea of reinforcement; whether a person believes that his/her own behaviour, skills, or dispositions determine what reinforcement he/she receives (Rotter, 1966). “One of the determinants of this reaction is the degree to which the individual perceives that the reward follows from, or is contingent upon, his own behavior or attributes versus the degree to which he feels the reward is controlled by forces outside of himself and may occur independently of his own actions” (Rotter, 1966, p.1). When a reinforcement is perceived by an individual as occurring partially because of his/her own action, but not entirely contingent upon that action,
then it is typically perceived as the result of chance, fate, the control of powerful others, or as unpredictable (Rotter, 1966). When an individual interprets the event this way, it is called external control. Alternatively, if a person perceives that an event is contingent upon “his or her own relatively permanent characteristics” (Rotter, 1966, p. 1), this is identified as internal control. People can be classified along a continuum, from a very internal locus of control to a very external locus of control.

Locus of control is the underlying framework of Rotter’s (1954) Social Learning Theory, which suggests the importance of the influence that the environment and reinforcement can have on personality. In social learning theory, “a reinforcement acts to strengthen an expectancy that a particular behavior or event will be followed by that reinforcement in the future” (Rotter, 1966, p.2). The general hypothesis for this theory is that when the reinforcement is seen as not contingent upon the subject’s own behaviour, its occurrence will not increase expectancy as much as when it is seen as contingent (Rotter, 1966). An individual’s history with reinforcement has a large impact on the degree to which he/she attribute reinforcements to his/her own actions, in turn, this could possibly affect a variety of behavioural choices across life situations (Rotter, 1966).

The idea that individuals build up generalized expectancies for both internal and external locus of control may have implications for problems of acquisition and performance. If a human can interpret or perceive future events as a result of his/her previous behavior, then the strength of that connection will depend at least in part on whether or not he/she feels that there is a casual relationship between his/her behavior and the event (Rotter, 1966). However, once a person has established the concept of chance and does not see a connection between his/her behavior and the event, then the effects of reinforcement will vary depending upon what type of relationship he/she assigns to the behavior-reinforcement sequence (Rotter, 1966).
An example of this behaviour-reinforcement sequence can be seen in relationships between teachers and their students. If a teacher has an external locus of control towards his/her student, the teacher may view the student’s behavior as out of the student’s control (external locus of control). The teacher may feel that it is up to the student to try harder and that it is the student’s job to put tools in place to help him/her succeed in the classroom. Whereas with an internal locus of control, the teacher may feel that there are implementations he/she could make to help the student succeed, such as creating and executing a routine, having a schedule specific for the student, or creating a reward system with the student. “The individual is selective in what aspects of his behavior are repeated or strengthened and what aspects are not, depending upon his own perception of the nature or causality of the relationship between the reinforcement and the preceding behavior” (Rotter, 1966, p.5). With an internal locus of control, if the implementations the teacher used to help a student in his/her classroom were successful, then there is a greater probability that the teacher will continue to implement those strategies because the teacher’s behavior was reinforced with a positive outcome. Whereas if the implementations did not work for the student, it is less likely the teacher would continue to implement those unsuccessful strategies.

**Teachers’ content knowledge**

The knowledge that teachers have may impact their locus of control in classroom situations. If a student with an exceptionality has attention issues in the class, the teacher’s knowledge about the exceptionality may impact whether or not the teacher has an external or internal locus of control towards the child’s behavior. If the teacher has an adequate level of knowledge of the exceptionality, he/she may have a different locus of control than if he/she did not know very much about the exceptionality.
Teachers’ content knowledge was the construct used as a second pillar to the theoretical framework in this study. Content knowledge, as described by Shulman (1986), referred to “the amount and organization of knowledge per se in the mind of the teacher.” Subject matter refers to the subjects taught in the curriculum, while content refers to the information that makes up those subjects. Shulman (1986) argued that subject matter is no longer important and that teachers need to pay as much attention to the content aspects of teaching as they do the elements of the teaching process. Shulman further argued that it is impossible to be a good teacher unless the teacher looks at content knowledge because subject matter becomes transformed from the knowledge of the teacher into the content of the instruction.

Piaget looked at knowledge growth and stated that society could learn a great deal about knowledge as well as its development from a careful observation of the very young (Shulman, 1986). In other words, those who are just beginning to develop and organize their intellect. This study follows this lead by using the construct of teachers’ content knowledge to study pre-service teachers and analyzing their knowledge base of ADHD.

**Literature review**

In this section, I will discuss the current state of special education policies and the five categories of exceptionalities in Ontario as well as analyze the ways in which ADHD does and does not fit under these exceptionality categories. I will also discuss the ways that these policies impact the responsibilities and duties of general education teachers in regards to classroom behavioural management strategies, the use of Individual Education Plans, and the need for knowledge about ADHD specifically. Literature related to teachers’ (in-service and pre-service) knowledge of and attitudes towards children with ADHD was reviewed, as well as whether teachers’ knowledge and/or attitudes impact classroom experiences for students with ADHD.
Special education in Ontario

Ontario has been invested in supporting all students in their learning since 1980 (Gallagher-MacKay & Kidder, 2014). However, the various challenges of meeting this commitment are felt continuously by teachers, students, and families. In the 2010/2011 school year, an Identification, Placement, and Review Committee identified more than 191,600 Ontario students as exceptional pupils, with a further 127,600 students not formally identified, but receiving special education accommodations or programs (Ministry of Education, 2017). In Ontario’s publically funded schools, 17% of elementary students and 22% of secondary students received special education assistance, percentages which have significantly increased over the last two decades (Gallagher-MacKay & Kidder, 2014). In Canada, there are two main types of special education systems: inclusion system and identification system (Centre for ADHD/ADD Advocacy Canada, 2010).

Inclusion system. Some provinces have chosen to use a system of inclusion, including Manitoba, Northwest Territories, Nova Scotia, and Prince Edward Island (Centre for ADHD/ADD Advocacy Canada, 2010). This system of inclusion deals with the allocation of funding for additional resources and access to adaptations without the required identification of an exceptional learner (Centre for ADHD/ADD Advocacy Canada, 2010). School boards are given a lump sum of funding for special education purposes and are expected to ensure that each student receives the appropriate resources necessary to meet his/her individual learning needs (Centre for ADHD/ADD Advocacy Canada, 2010). However, the success of this system may depends on how school boards, as well as the classroom teachers, interpret the student’s individual needs. This system may fail students if teacher education on exceptionalities is insufficient, or if knowledge of exceptionalities is inadequate. Without adequate knowledge of exceptionalities (including common symptoms, classroom or medical accommodations, etc.),
students may not receive the appropriate resources to assist them in their academic success, leaving a heavy burden on the general education teachers to be well educated on exceptionalities.

**Identification system.** Most provinces and territories, Ontario included, use a system of formal identification. The identification process involves an analysis of the student’s medical, psychological, and academic achievement, as well as a discussion surrounding the student’s level of academic success and perceived needs by either a committee or school team (Centre for ADHD/ADD Advocacy Canada, 2010). In Ontario, this team is called the Identification Placement Review Committee (IPRC). The primary goal of the IPRC is to:

- Decide whether or not the student should be identified as exceptional, identify the areas of the student’s exceptionality according to the categories and definitions of exceptionalities provided by the ministry of education, decide an appropriate placement for the students, and review the identification at least once in each school year. (Identification and Placement of Exceptional Pupils, 1990)

The IPRC decides whether or not the child should be identified as exceptional based on the Education Act’s definition. According to the Education Act (1990), an exceptional pupil is defined as a “pupil whose behavioural, communicational, intellectual, physical, or multiple exceptionalities are such that he or she is considered to need placement in a special education program.” The Ministry of Education provides the categories and definitions of exceptionalities. The identification system is designed to ensure that all students with exceptionalities can be identified, and tasks the IPRC team (made up of school and School Board personnel) with deciding whether the students meet the outlined criteria set by the province for being deemed exceptional students (Centre for ADHD/ADD Advocacy Canada, 2010). Once formally identified as an exceptional pupil, this formal identification can be linked to specific funding allotted for the student’s needs. This formal identification qualifies students for special adaptations and resources
A formal identification follows students throughout his/her educational career, further allowing his/her access to resources and to adaptations of the curriculum, instruction, environment, and assessment if deemed necessary (Centre for ADHD/ADD Advocacy Canada, 2010). An informal Individual Education Plan (IEP), however, does not allow students’ the right to request adaptations and can be taken away from the student at any time (at the discretion of the principal). The principal can write an informal IEP for a child with perceived special learning needs or who may not yet be identified as an exceptional pupil. However, this informal IEP only lasts one school year; for that period of time, the informal IEP is to be viewed as law. Although students may receive an informal IEP, without a formal identification (allocated to specific funding and resources), students would not have the same resources available to them, leaving the teacher to rely on approaches such as differentiated instruction and universal design for learning. Having to implement such strategies may add pressure on teachers to thoroughly understand and be able to apply these two approaches, while also being expected to have adequate knowledge of the exceptionality in order to implement beneficial adaptations and modifications for the exceptional students in their classrooms. Without the required knowledge, it may be difficult for teachers to implement effective strategies that would positively support their exceptional students. Because of this, exceptional students may suffer academically if they are expected to rely on their general classroom teacher, who may or may not have a special education background, to fully support the exceptional learners without the help of a formal IEP.

A formal designation given by the IPRC team, gives the student his/her ‘rights’ to resources and adaptations making an IEP necessary (Centre for ADHD/ADD Advocacy Canada, 2010). An IEP, outlines the special education expectations, an outline of any special education programs and services received by the student, a statement regarding the methods that will be
used to assess the student’s progress, and if necessary (when the student is 14 years or older) a transition plan to post-secondary school activities (Identification and Placement of Exceptional Pupils, 1990).

**Students with ADHD and the identification system.** In Ontario, students with ADHD do not qualify for a formal IEP through the IPRC because ADHD is not a specific category of exceptionality. IEP’s are considered legal documents, however, without an IEP being tied to an official identification (aka an informal IEP), they can be removed at any time at the discretion of the principal (Centre for ADHD/ADD Advocacy Canada, 2010). A formal IEP is attached to a formal diagnosis (can also be tied to funding and resources), while an informal IEP is typically not linked to a formal diagnosis and can be taken away at the discretion of a principal. Although there are five categories of exceptionalities, students with ADHD can only be identified under the categories of Behaviour or Communication if there is a comorbid diagnosis, where their additional disability qualifies them as meeting the definition of that category (Centre for ADHD/ADD Advocacy Canada, 2010). Hence, this limitation leaves students with only ADHD (no comorbid exceptionality) to be excluded from receiving adaptations for their exceptionality.

Students with ADHD can be categorized under the Communication category if they have a comorbid diagnosis of learning disability; meaning, their learning disability is clearly identifiable outside of or in addition to, the typical impairments commonly seen in ADHD (Centre for ADHD/ADD Advocacy Canada, 2010). The main challenge with this distinction is that the characteristics of a learning disability often overlap with those that are typical of ADHD children. For example, both students with a learning disability and students with ADHD have difficulty with the “regulation of attention and frequent impairments in: executive functioning, handwriting, processing speed, working memory, reading, viewing and comprehension” (Centre for ADHD/ADD Advocacy Canada, 2010). All of these impairments impact a child’s learning
and academic performance, leaving it to be often difficult to distinguish between a learning disability and ADHD (Centre for ADHD/ADD Advocacy Canada, 2010). “Psychologists most often do not diagnose learning deficits that commonly occur with ADHD. They diagnose the ADHD, leaving the child unable to access accommodations within the school system” (Centre for ADHD/ADD Advocacy Canada, 2010). A child with ADHD can be placed under the Behaviour category if they have specific behaviours problems over a specific period of time and to a high degree, that it affects their educational performance (Centre for ADHD/ADD Advocacy Canada, 2010).

The first publication of the policy/program memorandum (PPM) #8, Identification of and Program Planning for Students with Learning Disabilities, was in 1982. With the PPM becoming out-dated, the Ministry of Education of Ontario brought together a team of Learning Disabilities team in 2011. This group was comprised of educators, psychologists, stakeholders, and internationally recognized researchers to inform the development of a revised version PPM number 8 (Learning Disabilities Association of Ontario, 2015). However, the current position of the Ministry of Education of Ontario still suggests that ADHD is not to be classified as a learning disability (Centre for ADHD/ADD Advocacy Canada, 2010). Therefore, unless behavioural difficulties are extreme or other comorbid challenges are present, ADHD does not qualify a student to be identified as an exceptional pupil. Even when receiving an IEP through the behaviour classification, the issue then becomes the focus on the student’s behaviours while ignoring the cognitive functioning impairments and other ADHD characteristics.

According to the updated PPM #8, a “school principal may decide to develop an IEP for a student who demonstrates difficulties in learning and who would likely benefit from a special education program and/or services appropriate for students with learning disabilities” (Ministry of Education, 2014). Unfortunately, the Ministry of Education admitted that memorandum’s were
a form of guidance, rather than a mandate (Centre for ADHD/ADD Advocacy Canada, 2010). Memorandums were considered ‘grey literature’, as they are not laws and hence can be difficult to enforce. This suggested that the Ministry of Education did not have a way to hold school boards accountable for not following through on the statements within the memorandums (Centre for ADHD/ADD Advocacy Canada, 2010). These updated memorandums are currently still in effect. Inequitable situations continue to arise when some school boards choose to allow an informal IEP for students with ADHD, whereas other school boards may not. This creates a further problem of inconsistency between boards and a lack of equity towards students with ADHD. As well, although IEPs without having an official identification are considered legal documents, the individual school can remove the students’ IEP at any given time. This lack of recognition of ADHD as a valid exceptionality (without its own exceptional category) from the Ministry of Education and school boards may encourage educators to believe that ADHD is not a legitimate exceptionality.

Attitudes concerning the acceptance of ADHD as a valid medical diagnosis may have an impact on the relationship between teacher and student. The view of ADHD being an illegitimate diagnosis or even a social construct may influence teachers’ attitudes to be more negative towards students with ADHD in the classroom (Centre for ADHD/ADD Advocacy Canada, 2010). The validity of a diagnosis could possibly assist teachers in understanding that the ADHD-characteristics of their student are out of the child’s direct control. Without a diagnosis, teachers may attribute the child’s behaviours to the stereotypes of ADHD such as laziness, chooses to misbehave, and not enough discipline (Centre for ADHD/ADD Advocacy Canada, 2010).

**Teachers’ role**

With the full integration method in Ontario schools, the pressure falls onto classroom teachers to be comfortable with and competent at adapting and modifying curriculum and
instruction, in order to meet the needs of all of their students; this includes those students who have exceptionalities that affect their learning (Stanovich & Jordan, 2002). Studies suggested that many teachers currently teaching in classrooms have not been prepared to meet the challenges they face on a daily basis, with teacher education programs lacking in adequately preparing the teachers for the new challenges they may face (Stanovich & Jordan, 2002). To be able to effectively accommodate, modify, and provide strategies that will positively benefit students with ADHD, general education teachers would benefit from being knowledgeable about ADHD, including typical characteristics, symptoms, and intervention strategies.

**ADHD in the classroom.** The expectations and responsibilities of a classroom teacher are significant. They are responsible for creating classroom environments that are conducive to students’ academic, emotional, and social success. However, the work of a classroom teacher may become much more onerous when having a student with ADHD in their classroom. The difficulties that students with ADHD face include attention and impulsivity issues and high activity levels; all three frequently interfere with both academic and social activities (Barkley, Murphy, & Fisher, 2003).

There are three primary categories of symptoms that characterize ADHD: inattention, hyperactivity, and impulsivity. In all subtypes of ADHD, the symptoms are present before the age of 7, are apparent in two or more settings (e.g., home, school, social), are inconsistent with the development stage of the child, and negatively impacts his/her social and academic spheres (Moldavsky, Groenewald, Owen, & Sayal, 2013). However, students with ADHD show a great variability in their symptom severity and perform differently in various situations and across tasks; no child with ADHD is the same. Studies have shown that most children diagnosed with ADHD are within the normal range of intelligence, and they often struggle with applying their abilities to everyday situations (Perold, Chow, & Kleynhans, 2010). Other factors that may
influence students with ADHD’s academic performance are the complexity of the task and requirements for organization, the amount and level of stimulation, and the immediacy or feedback consequences (Perold et al., 2010). Studies show that during the primary/junior years, students with ADHD experience problems with cognitive functioning, further resulting in academic difficulties such as poor reading and mathematics performance (Daley & Birchwood, 2009). Thus it is extremely important for teachers to understand ADHD in order to be able to effectively adapt their instruction and curriculum, implement classroom management strategies, and establish realistic expectations for their students with ADHD. It will also assist teachers in creating a positive learning environment for students with ADHD that is conducive to academic, social, and emotional success (Perold, Louw, & Kleynhans, 2010).

**Direct role.** Adults who have continuous contact with children have a pivotal role in the recognition and referral of exceptionalities, such as teachers. Studies suggest that teachers are often the first to observe the possibility of ADHD in their students (Groenewald, Emond, & Sayal, 2009). This may be due to the immense amount of time teachers spend with their students during the academic school year as well as the daily exposure teachers have with ADHD-type characteristics in their classrooms and schools. ADHD symptoms often impact the classroom environment as well as the individual child’s school performance, leaving the characteristics of ADHD easier to spot in an academic setting. Studies suggest that when compared to other pupils, students with ADHD often engage in “more off-task behaviour, more talking than other pupils, more disruptive behaviour (interrupting others, pulling faces, distracting others), more excessive motor activity (fidgeting, leaving their seat), more self-stimulating behaviours (pulling an ear, singing to self, or rocking), more frequent negative social behaviour (aggression and negative social responses), as well as more inappropriate attention seeking (e.g. calling out to the teacher)” (Lauth, Heubeck & Mackowiak, 2006). The classroom is also an environment that has been
deemed the primary setting for recognizing ADHD problems, “due to the special demands for attention, learning, and self-control, as well as the ready availability of other children for developmental comparisons” (Lauth et al., 2006). Teachers are often able to pinpoint what developmental behaviours are typical for their students’ age group and which behaviours are not typical, due to having experience working with a variety of children (Lauth et al., 2006).

Although teachers are not qualified to diagnose exceptionalities in their students, it is imperative for teachers to be knowledgeable about the symptoms of ADHD as they are often the first to recognize and suggest the possibility of ADHD (Sax & Kautz, 2003). Further, once they are aware of those behaviours that are typical of ADHD, they can consult the school psychologists with their concerns and advocate for a formal assessment. How a teacher understands ADHD also impacts how she/he responds to ADHD in a classroom setting (Kos et al., 2006), further impacting the student with ADHD's educational experience. For example, if a teacher perceives ADHD to be more a social construct, a teacher may feel that a student with ADHD just needs to try harder to succeed academically. Whereas, a teacher who is more educated in regards to ADHD may know strategies and routines to assist a student with ADHD in the classroom.

**Stigma and mental health**

ADHD is one of the most commonly diagnosed psychiatric disorders in children and adolescents, with an average of approximately 3 to 6% of the childhood population having the disorder (Kos et al., 2006 & Cantwell, 1996). ADHD is also a psychiatric disorder that is categorized as a mental illnes (Bell, Long, Garvan, & Bussing, 2011). Those with mental illnesses tend to experience more stigmatization than those with physical disabilities, possibly due to the visibility of physical disabilities whereas mental illnesses are typically unseen (Corrigan & Watson, 2002). Individuals suffering from mental illness are seen as being held accountable for their illness, leaving them as victims of stigmatization (Bell et al., 2011). The
term stigma is an umbrella term that encapsulates stereotypes, prejudice, and discriminatory behaviors towards individuals with mental health challenges (O’Driscoll, Heary, Hennessy, & McKeague, 2012). Stereotypes are cognitive schemas or beliefs about members of a social group (ADHD in this study), while prejudice involves “affective laden negative attitudes that influence behavior towards the stigmatized person or group” (O’Driscoll et al., 2012). Unfortunately, stigmatizing views in regards to mental illnesses are not limited to uniformed members of the general public; well-trained professionals from many mental health disciplines subscribe to stereotypes about mental illness (Corrigan & Watson, 2002).

Stigmatization associated with mental illness challenges tends to be expressed overtly, whereas with experiences such as racism, the discrimination is seen as unacceptable and therefore expressed indirectly (Wiener et al., 2012). Hinshaw (2002) also stated that there are three aspects of mental illnesses, such as ADHD, which may result in these individuals being stigmatized (Wiener et al., 2012). First, as ADHD is not immediately visible, the reasons for the perceived abnormal behaviour may not be apparent to others such as peers or teachers. Second, ADHD is a lifelong challenge; individuals who are viewed as having lifelong mental illness challenges are more likely to become stigmatized than individuals where the challenge can be solved or is viewed as short-lived (Wiener et al., 2012). Third, people in the same environment as a child with ADHD may perceive the behaviours to be controllable by the child.

Stigmatization is less likely to occur when the reason for the behaviour comes from an uncontrollable cause (Wiener et al., 2012). The definition of stigma varies because the concept of stigma can be applied to various circumstances. For the purpose of this study, Goffman’s (1963) definition of stigma has been adopted in this study because it is widely used and more empirically supported than other definitions in this field. Goffman (1963) suggested that there are two types of stigma: public and self. Public stigma can be seen through forms of prejudice, stereotypes, and
discrimination, whereas self-stigma appears when the stigmatized individual internalizes the beliefs that others hold about him/her (Bell et al., 2011).

**In-Service and pre-service teachers’ knowledge of ADHD**

ADHD symptoms often become more challenging and more visible when the child starts school, with the symptoms continuing to be a challenge for the child with ADHD across their lifespan (Mulholland et al., 2015). Secondary impairments also become more dominant when students with ADHD start school, specifically in the areas such as working memory, motivation, and the internalization of speech (Mulholland et al., 2015). With these impairments comes a high comorbidity rate, with approximately 31-45% of children with ADHD having a learning disability (DuPaul, Gormley, & Laracy, 2013).

It is very important for teachers to be knowledgeable about ADHD, as they are often the front-line identifiers for ADHD and their comorbid diagnoses. Teachers are often expected to be the first people to recognize exceptionality characteristics and send students showing those symptoms for a referral (Moldavsky, Groenewald, Owen, & Sayal, 2013). In this study, the definition of knowledge by Anderson, Watt, Noble, & Shanley, (2012) will be used due to its pervasiveness in the field of knowledge research. Knowledge refers to the "extent of information about an issue that can be recalled" (Anderson et al., 2012).

There is a dearth of literature examining teachers’ knowledge of ADHD. With this scarcity of data come contradictory results in teachers’ knowledge of ADHD (Kos et al., 2006). Jerome, Washington, Laine, and Segal (1999) studied the differences in knowledge of ADHD between pre-service and in-service teachers. They reported very little difference regarding knowledge of ADHD and stereotypical conceptions between pre-service teachers and in-service teachers. However, later studies contradicted these findings (Anderson et al., 2012; Bekle, 2004; Kos, Richdale, & Jackson, 2004). Kos et al. (2004) found that more experienced teachers
engaged in professional development regarding ADHD, resulting in higher levels of knowledge and understanding of ADHD. In-service teachers scored 60.7% on the knowledge scale, with pre-service teachers scoring 52.6%; in-service teachers having higher knowledge regarding the causes of ADHD, but scoring a similar low score to pre-service teachers regarding knowledge of the relationship between ADHD and diet (Kos et al., 2004). Jerome et al. (1999) and Barbaresi and Olsen (1998) reported that teachers correctly answered 77.5% and 77% of the ADHD knowledge items. Sciutto et al. (2000), however, reported that teachers scored only 47.8% on their respective knowledge questionnaires. Higher scores in the previous studies mentioned may be a result of methodological differences (Kos et al., 2004). Sciutto et al. (2000) used three options (true, false, and don’t know). Both Jerome et al. (1994) and Barbaresi and Olsen (1998) distributed the same survey; however, they only provided respondents with two response options (true or false). Given that participants had a 50% chance of getting the question correct, it is possible that the reported scores are actually artificially inflated (Kos et al., 2004).

Other contradicting findings were discovered between Bekle (2004) and Anderson et al. (2012). Bekle (2004) found that in-service teachers had higher rates of knowledge than their pre-service counterparts, whereas Anderson et al. (2012) found little difference between the two groups of teachers, which is similar to Jerome et al. (1999) results. Anderson et al. (2012) reported that pre-service teachers, both with and without the practicum teaching experience, had approximately the same level of knowledge of ADHD; scoring 52.2% and 52.9% respectively, which was significantly lower than in-service teachers, who scored 60.2%.

Overall, considering that pre-service teachers will be employed within the education system and will likely have a student with ADHD in their class (Barkley, 1998), it is important that the accuracy of pre-service teachers’ ADHD knowledge be assessed (Kos et al., 2004). Although teachers’ knowledge of ADHD has been investigated, the relevance of this knowledge
has not been thoroughly examined. Instead, what has been examined is the false factual information teachers believe to be true (Mullohand et al., 2015).

**In-Service teachers’ attitudes towards ADHD**

It has been argued that teachers' attitudes towards ADHD are likely to influence their roles as teachers and the subsequent behavioural and learning outcomes for students with ADHD (Anderson et al., 2012). In order to examine teachers' attitudes towards ADHD, a definition of attitudes must be presented. As defined by Eagly and Chaiken (1998), "attitudes refer to the evaluation of people, events, objects, or issues as either favourable or unfavourable" (269). Stronger attitudes are more resistant to opposing viewpoints, leaving them to have a greater influence on thought process and behaviours (Anderson et al., 2012). Weaker attitudes, however, are more inconsequential and open to change (Anderson et al., 2012).

With little research conducted on teachers’ knowledge of students with ADHD, even fewer studies have assessed teachers' attitudes and perceptions towards ADHD (i.e., beliefs and feelings about ADHD) (Kos et al., 2006). The studies that have been conducted demonstrated that teachers' attitudes about ADHD might influence their selection of a teaching approach (Westwood, 1996), their willingness to implement interventions (Vereb & DiPerna, 2004), their chosen behavioural management strategies, and classmates' perceptions of the child with ADHD (Atkinson, Robinson, & Shute, 1997).

Mulholland et al. (2015) examined in-service teachers’ attitudes towards ADHD, ADHD-type behaviours, and students who exhibit these behaviours. Mulholland et al. (2015) found that teachers generally held negative feelings towards students with ADHD, with 78.1% of teachers finding behaviours associated with ADHD irritating in the classroom and 69.8% of teachers stating that students who display ADHD-type behaviours cause them to experience stress. Some attitudes were positive; 64.2% of teachers reporting that they believed students who exhibit
ADHD-type behaviours are rewarding to work with in their classroom (Mulholland et al., 2015). However, only 40% of the respondents believed that teaching students with a diagnosis of ADHD benefited their teaching skills, because it allowed them to differentiate lesson plans (Mulholland et al., 2015). A large percentage of respondents, 60%, believed that children who exhibit ADHD-type behaviours should try harder to focus on their schoolwork. With generally negative attitudes found in the Mulholland et al. (2015) study, a large amount of the respondents did agree that ADHD is a valid diagnosis and expressed a strong desire for better training and professional development regarding ADHD (Mulholland et al., 2015).

Negative attitudes expressed by a teacher may influence the self-fulfilling prophecy of a child with ADHD. Several studies have addressed the potential for adults’ expectations to create a child’s self-fulfilling prophecy that can later affect a child’s level of academic achievement (Bell et al., 2011). To decrease the risk of a self-fulfilling prophecy Rizzo and Vispoel (1991) suggested increasing teachers’ competence in teaching students with ADHD. Their findings revealed that the more competent a teacher felt, the more favourable their attitudes were regarding teaching these students. With studies suggesting that in-service teachers’ attitudes of ADHD are predominantly negative (Mulholland et al., 2015), a possible way to offset these negative attitudes would be to intervene in pre-service learning (Forlin et al., 2009).

**Pre-Service teachers’ attitudes towards ADHD.** Researchers have argued that pre-service education would be the optimal time to address teachers concerns and begin to change any negative attitudes towards inclusive education or exceptionalities in general (Forlin, et al., 2009; Harvey, Yssel, Bauserman, & Merblr, 2010). There is a dearth of research in the area of pre-service teachers understanding of ADHD, but even more of a lack of research in the area of pre-service teachers attitudes towards students with ADHD. The minimal research that is available has shown that teachers form beliefs about their teaching practice during their pre-
service training and that once these beliefs are embedded, the attitudes can be resistant to change over the span of pre-service teachers teaching career (Woolfolk-Ho & Spero, 2005).

Some teachers are thought to handle special education needs better than others, and a predictor of this difference between teachers in teaching children with exceptionalities is their attitudes towards these children (Cassady, 2011). Teachers’ attitudes influence effective use of resources in the classroom and implementation of interventions to improve children's mental health in schools, teacher stress levels and burnout, and the students' achievement and social-emotional experiences (Elik, Weiner, & Corkum, 2010). Levins, Bornholt, and Lennon (2005) examined pre-service teachers' attitudes towards students with exceptionalities, including ADHD, and attempted to understand the implicit and explicit attitudes of teachers. Levins et al. (2005) felt that understanding implicit and explicit attitudes were an important precursor to improving teaching practices for teachers of children with special needs. Results showed that attitudes were less positive about children with low social skills (those with ADHD) and more positive about children with low cognitive skills (Levins et al., 2005). Pre-service teachers' attitudes tended to vary according to the type of disability and the extent of instructional adaptations to be made to accommodate the student (Levins et al., 2005). This research further supported the importance of understanding teacher attitudes, because teacher attitudes are critical variables in the prediction of educational success of children with special needs (Bacon & Shultz, 1991) and the success in integration of children with disabilities into the general classroom (Stewart, 1990). In general, research has shown that when teachers (both in-service and pre-service) have positive mindsets towards inclusion, they more readily adapt their teaching methods to meet a variety of student learning needs (Ajuwon et al., 2012).

**Teachers’ perceptions of students with ADHD**

Children’s self-esteem and self-confidence have been shown to be highly sensitive to the
perceptions expressed by peers, family, and teachers (Guevremont & Dumas, 1994; Roe, 1998; Wheeler & Carlson, 1994). Furthermore, the perceptions and expectations of parents and teachers affect their interactions with children, which can in turn affect children’s behavior and academic success (Brattesani, Weinstein, & Marshall, 1984; Chi & Hinshaw, 2002; Feldman & Theiss, 1982).

Research suggested that a common perception among teachers was that acting-out behaviours in the classroom were more challenging than withdrawn behaviours (Kos, Richdale, & Hay, 2006), which coincides with Bell et al. ’s (2011) findings that suggested ADHD behaviours were most salient in the classroom because of the expectation that students were to be calm and attentive while demonstrating self-control. Research suggested that teachers tend to perceive children with ADHD as requiring extra teaching time and effort, leading the teachers to be pessimistic about teaching students with ADHD (Bell et al., 2011). Similarly, Eisenberg and Scheider (2007) found that teachers held stronger negative perceptions about the academic performance of students with ADHD (both boys and girls) compared to those without ADHD, even if both groups of children performed similarly academically and showed similar externalizing behaviours. Furthermore, Chi and Hinshaw (2002) found that negative perceptions held by teachers affected the interactions between students with ADHD and their teachers, which in turn, influenced the children’s behaviour and academic success.
CHAPTER 3

METHODOLOGY AND METHOD

Methodology

This study used a mixed-methods design, which was a design used for collecting, analyzing, and mixing both quantitative- and qualitative-based processes within a single study, in order to gain more breadth and depth of understanding the research problem (Creswell, 2002). The rationale for mixing was that neither quantitative nor qualitative methods were sufficient by themselves to capture pre-service teachers’ knowledge, attitudes, and perceptions of students with ADHD. The literature has consisted primarily of quantitative data and has provided a general understanding of teachers’ knowledge of ADHD. However, the results have been contradictory. By adding a qualitative measure in the research design, it revealed a more elaborate response to the survey questions, and gained deeper insight into pre-service teachers’ attitudes and perceptions. When combined, qualitative and quantitative measures complimented each other by pulling on the strengths of both quantitative and qualitative methods, while buttressing the others’ weaknesses, allowing for a more complete analysis and an in-depth understanding of the research problems (Green, Caracelli, & Graham, 1989, Tashakkori & Teddlie, 1998). Mixed-method designs can provide pragmatic analytical advantages when exploring more complex research questions. “The qualitative data provides a deeper understanding of survey responses, and statistical analysis can provide detailed assessment of patterns of responses” (Driscoll, Appiah-Yeboah, Salib & Rupert, 2007).

A quantitative researcher “uses post positivist claims for developing knowledge, such as cause and effect thinking, reduction to specific variables, hypotheses and questions, use of measurement and observation, and the test of theories” (Ivankova, 2002, p.33). The variables in quantitative-based research are often isolated and are causally related to determine the frequency
and magnitude of relationships. Alternatively, qualitative research is “an inquiry process of understanding” where the researcher develops a “complex, holistic picture, analyzes words, reports detailed views of informants, and conducts the study in a natural setting” (Creswell, 1998, p. 15). Data analysis is “based on the values that these participants perceive for their world” (Ivankova, 2002, 9. 44). A qualitative-based design helps to produce an understanding of the problem based on multiple contextual factors (Miller, 2000).

When combining quantitative and qualitative research designs, the research builds knowledge on pragmatic grounds (Morgan, 2007). Similar to quantitative or qualitative studies, when conducting a mixed-method study, researchers choose approaches, variables, and units of analysis most appropriate for finding the answer to his/her proposed research question (Tashakkori & Teddlie, 1998). One of the main principles of pragmatism is that quantitative and qualitative methods are compatible (Morgan, 2007). Further, both numerical and text data, whether collected concurrently or sequentially, can help to understand the research problem better (Morgan, 2007).

This study used a sequential explanatory mixed-method design (Creswell, 2002). It is characterized by “the collection and analysis of quantitative data in a first phase of research followed by the collection and analysis of qualitative data in a second phase that builds on the results of the initial quantitative results” (Creswell, 2002). In this strategy, significant weight is often given to the quantitative data, with the mixing of data occurring after the initial quantitative results have informed the secondary qualitative data collection (Creswell, 2002).

**Methods**

**Participants** The participants of this study were from a consecutive Bachelor of Education program at a university in Ontario. 36 pre-service teachers in the primary/junior division were recruited to participate in a pre- and post-test involving their practicum and
coursework experience in their fall semester. Only 28 of the participants participated in time 2 of the questionnaire distribution. Three of those 28 participants took part in individual interviews during phase 2 of the study. The sampling technique chosen for this study was purposive random sampling. This sampling technique involves the “random selection of a small number of cases from a larger population” (McMillian & Schumacher, 2010, p. 399). Because the purpose of this study was to examine change over time in pre-service teachers’ knowledge, attitudes, and perceptions, analysis of responses were focused specifically on comparing time 1 and time 2. Thus, only those participants that completed both stage 1 and stage 2 were included in the analysis and will be presented in the results section. At time 2, 8 participants chose not to complete the questionnaire. This resulted in an attrition of approximately 22% complete data, represented by a total of 28 participants who completed questionnaires at both time points. The mean age of the 28 participants who participated at time 1 and time 2 was 25.5 years. This sample included 22 females and 5 males, and 1 chose not to identify their gender.

By focusing upon pre-service teachers at one university, the researcher was able to begin to provide an accurate description of the knowledge, attitudes, and perceptions of pre-service teachers’. Primary/junior division pre-service teachers were selected because ADHD behavioural characteristics tend to be more prevalent in the primary/junior years, and primary/junior teachers spent more time with their students during a teaching day and took more curriculum courses and fewer electives (that may or may not include ADHD as a topic) than intermediate/senior consecutive education students. This was an important factor because ADHD may or may not have been taught in the curriculum courses, and the primary/junior teacher candidates had fewer options to possibly learn about ADHD in elective classes.

Only consecutive education pre-service teachers were considered for participation in this study. By including consecutive education rather than concurrent education pre-service teachers,
it was less likely that their knowledge and previous experiences would influence the study’s results. That is, consecutive education pre-service teachers are more likely to not have taken education courses in their undergraduate programs and would not have completed teaching placements in the public school system. Concurrent education pre-service teachers, however, have had three years of coursework and practicum experience prior to the time this study took place in their program.

**Recruitment** After having received ethical clearance from the university to conduct the study, the researcher sought permission to send a recruitment email to newly enrolled consecutive education pre-service teachers through the listserv. If pre-service teachers wanted to participate in this study, they sent me an email stating so and were then sent an email through FluidSurvey with a link to the questionnaire. Through the link, pre-service teachers were provided a letter of information and a consent form at the beginning of the survey. These documents outlined that by selecting ‘yes’ to participate and then the ‘next’ button, they were giving their consent. However, it was noted that the participant may exit the survey at any time and their data would be used only if they consented. As an incentive to complete the questionnaire, participants were entered into a draw for a chance to win one of ten gift cards. The winners were contacted by the researcher via email and were given the gift cards in person by the researcher.

Before starting the questionnaire, it was noted in the letter of information and consent form that the participants might be contacted later in the semester to participate in one-on-one interviews, in which at that time they could accept or decline the invitation. Once the questionnaire data was entered and analyzed, particular students were contacted by email and asked to participate in one-on-one semi-structured interviews. As an incentive to participate in the interview, participants had a 1 in 4 chance to win a gift card. With only three interview participants, all participants were given a gift card at the end of their individual interview.
Once the online questionnaire of the study was deemed live and after invitations were sent out twice to the consecutive education pre-service teachers, the researcher received four responses. Without having a sufficient number of participants, other recruitment strategies were necessary in order to recruit a sufficient amount of participants for both phase 1 and phase 2. Instead of having the survey online for participants to complete on their own time, the researcher chose to send emails to the practicum course instructors. I submitted an ethical amendment stating the changes to my recruitment strategies and received ethical approval for these changes. The email contained information about the study, the time needed to complete it, and asked the professors permission for the researcher to come into their classes. Once the researcher gained permission, the researcher took the printed surveys and put them in envelopes. The researcher went into the professors’ classrooms during the last 5 minutes of the class and read out loud the letter of information and consent form. The professors left the classroom. If participants chose to partake in the survey, they would remain in the classroom, fill out the survey, and hand it back to the researcher. The researcher made it clear in the letter of information form that if students chose to stay behind to fill out the survey, they were consenting to participating and they were okay with their peers knowing that they participated in the survey. A second option was for students to take a survey, fill it out at a later date, and email me so we could set up a time for them to return the survey. Before participants began the survey, the researcher clarified that all participants would be receiving an email from the researcher later in the semester to fill out the survey a second time online. Choosing to go into the classroom and giving the students time to fill out the questionnaire in class increased the studies response rate to the questionnaire.

There were two main phases to this study: Phase 1 involved the use of a questionnaire distributed at two time points, and phase 2 consisted of semi-structured individual interviews.
Phase 1

**Questionnaire.** The questionnaire was split into four sections: demographics (A), knowledge (B), attitudes (C), and perceptions (D), with two open ended questions at the bottom of section B, C, and D. These open-ended questions allowed the participants to provide further insight into their knowledge within the specific subcategory and to expand on their answers.

**Procedure for data collection.** The questionnaire for this study was uploaded to an online system (FluidSurvey), making it easily accessible for participants. However, the questionnaire was later printed for participants to complete by hand, in order to increase participation rates. Therefore, some participants filled out the questionnaire by hard copy, with the data being manually inputted into SPSS. Participants completed each section in order (Part A, B, C, and D), as each section was printed on its own page and the online version would not let you continue on to the next page unless the current page was completed. This was to help to avoid participants skipping ahead to read future questions or returning to previous questions, which may have influenced the way participants answered the questions. The questionnaire took participants approximately 20 minutes to complete each time. The questionnaire was distributed at two different times: Time 1 occurred pre-coursework/pre-practicum and Time 2 occurred post-practicum. At time 1, participants had taken part in a 3-week practicum placement (strictly observe and assist) and had taken a few summer courses. At time 2, participants had now had a full fall term course load, which included curriculum coursework, and had just come back from a 6-week teaching practicum.

**Part A-Demographic.** Section A of the questionnaire gained insight into the participants’ personal and professional experience. This included their gender, age, academic experience, professional training on exceptionalities, and experience working with students with ADHD and if those students were formally diagnosed.
**Part B-Knowledge.** Part B of the questionnaire assessed pre-service teachers’ knowledge using a modified version of the scale developed by Mulholland et al. (2015). This section was divided into two sub-sections: ideological knowledge and evidence-based knowledge. The original Mulholland (2015) knowledge section had 20 questions using a 3-point Likert-type Scale (disagree, neither agree nor disagree, and agree). The researcher removed questions that would not help in answering my research questions. The researcher also removed questions based on poor wording choices. For this study, the researcher chose 9 questions from the original 20 in order to make the completion time of this study more feasible. The original 3-point Likert-scale was modified to a 5-point Likert-type format, in order to increase the reliability of the scale. With this change in format participants were given more flexibility in their answers, while lowering their chances of feeling pressured to answer one of the three options and providing a greater degree of variability in the data, thus allowing results to be more sensitive to differences across participants. The 5-point Likert-type format was: 1 strongly disagree, 2 somewhat disagree, 3 don’t know, 4 somewhat agree, and 5 strongly agree. In scoring these items, responses for strongly disagree were recorded as a 1, responses for somewhat disagree were recorded as a 2, responses for somewhat agree were recorded as a 3, and responses for strongly agree were recorded as a 4. Responses for don’t know were recorded as a 0. The total possible score on the attitudes scale will 80.

**Part C-Attitudes.** The attitudes scale (section C) was a modified version of the scale developed by Mulholland et al. (2015). The original scale had 30 questions, with a 6-point Likert-type format (1 strongly disagree, 2 disagree, 3 somewhat disagree, 4 somewhat agree, 5 agree, and 6 strongly agree). The researcher removed questions that would not help in answering the proposed research questions. The researcher also removed questions based on poor wording choices. The researcher chose 10 questions from the original 30, in order to make the completion
time for this study more feasible. The Attitudes section was further divided into two sub-sections: Attitudes towards professional practice and attitudes towards social/emotional experience. Items in this section focused upon teachers’ attitudes of ADHD, in particular, their attitudes towards ADHD as a diagnosis, behaviours associated with ADHD, and students who exhibit these behaviours. This scale was reformatted to a 5-point Likert-type scale: 1 strongly disagree, 2 somewhat disagree, 3 don’t know, 4 somewhat agree, and 5 strongly agree. In scoring these items, responses for strongly disagree were recorded as a 1, responses for somewhat disagree were recorded as a 2, responses for somewhat agree were recorded as a 3, and responses for strongly agree were recorded as a 4. Responses for don’t know were recorded as a 0.

**Part D-Perceptions.** The last section of the questionnaire (section D) was created to examine pre-service teachers perceptions of students with ADHD, followed by two open-ended questions that were examined through the lens of locus of control theoretical framework. The perception section, developed by Dr. Berg and the researcher, consisted of 11 questions using a 5-point Likert format as well. The 5-point Likert-type format was consistent to the one in the previous section, with 1 representing strongly disagree and 5 representing strongly agree.

**Open Ended Questions.** Two open-ended questions were added to the end of sections B, C, and D during the second completion of the survey at time 2. At the end of the Knowledge section, one question was about substantive knowledge (What do you wish you had learned about ADHD?) and one was about syntactic knowledge (In what ways will you implement your knowledge of ADHD in your future classroom?) The open-ended questions at the end of the Attitudes section focused upon what the participants thought (How does ADHD impact your teaching practice in the classroom?) and upon how they felt (What are the positive and negative aspects of having students with ADHD in the classroom?) The open-ended questions at the end of the Perceptions section focused upon pre-service teachers’ understanding of ADHD in the
classroom (How can students with ADHD be effectively accommodated in the classroom?) and their interpretation of how ADHD can influence the classroom (How do the experiences of students with ADHD influence the classroom environment?)

**Data analysis for time 1 and time 2.** Paired sample *t*-tests were used to identify any changes in pre-service teachers’ knowledge, attitudes and perceptions of students with ADHD between pre- and post-practicum and pre- and post-coursework experience. The researcher analyzed changes from Time 1 (pre-practicum/coursework) to Time 2 (Post Practicum). To examine the magnitude of differences for any significant change, Cohen’s *d* was calculated. The magnitude of difference were interpreted through 3 value ranges: a small difference was reflected by values less than .20, a medium difference was reflected by values less than .50, and a large difference was reflected by a value that is .80 and above (Cohen, 1988). Given the number of comparisons being made between knowledge, attitudes, and perceptions, a Bonferroni correction procedure was used. A Bonferroni correction was used to control the family-wise error rate; thus ensuring that at maximum, one false positive would be obtained. Thus, an alpha of .05 divided by total number of questions (30) produced an alpha level of less than .005. Based on the Bonferroni correction, four significant differences were found from time 1 to time 2. Ignoring the controlling of the family-wise error could lead to the identification of false-positive results.

In addition to examining significant differences across Times 1 and 2, effects sizes (using Cohen’s *d*) were calculated to examine the magnitude of significant differences. Estimates of magnitude ranges were interpreted based upon a small effect around *d* = .20, a medium effect around *d* = .50, and a large effect greater than *d* = .80 (Cohen, 1988). Concept mapping was used to analyze the open-ended questions at the bottom of sections B, C, and D of the questionnaire (Jackson & Trochim, 2002). Concept mapping was used to develop coding schemes and to re-examine existing theoretical coding schemes, while assisting in the development of interview
questions (Jackson & Trochim, 2002). The analysis of the data and its results from the questionnaire section, both at time 1 and time 2, were used to select participants for the interview stage of the study and to assist in the development of the interview questions.

**Phase 2**

*Interview.* Three 60-minute individual interviews were conducted, which consisted of semi-structured questions. Two types of questions were used: general and individual. The individual questions were created based off of the participant’s individual questionnaire data results.

*Data collection.* After analyzing phase 1 data (which consists of both time 1 and time 2 data), 12 participants out of a total 28 were invited to participate in follow-up individual interviews, with a total time of 60 minutes per participant. The longest interview conducted was 50 minutes and the shortest was 36 minutes. The participants were selected based on their individual questionnaire data. To gain more depth to the questionnaire data, participants were selected who had shown change, both positive and negative, over time 1 and time 2. Originally, only 2 participants had responded in a two-week time period. To increase my response rate, an ethical amendment was submitted to increase my incentive rate. The amendment was approved and each participant was given a $25 visa gift card. A follow-up recruitment email was then sent for interviews and 3 more responses were received. A total number of 3 people participated in one-on-one interviews.

*Participant demographics.* Three participants were recruited to partake in the interview stage. Pseudonyms of Linda, Kelsey, and Doug were used to protect participants’ identities. The first interview participant, Linda, held a bachelor of science with a forest school certificate as her only professional training. Professional training refers to workshops, certificates, or any additional training in regards to exceptional learners. When asked what experiences she had with
ADHD, Linda discussed working with and having taught students with ADHD in a previous employment position that involved working with students. The second interview participant, Kelsey, has a bachelor of arts in global studies and English. When asked if she had any professional training, Kelsey stated that she had none. When discussing her experiences with ADHD, Kelsey stated she worked at a day camp, volunteered, and worked with students with ADHD on her observe and assist practicum. The last participant was Doug, who has a bachelor of science in neuroscience/psychology. Doug had first aid and Tribes training as his professional development. The Tribes course teaches teachers step-by-step strategies to assist them in creating a positive classroom environment and improve student behaviour and learning. When asked about experiences Doug had with ADHD, he described working with students during his previous time teaching abroad, and that during his observe and assist practicum he had many students who were suspect of ADHD.

*Instruments and procedures.* There were general questions that were asked to each participant, and individual questions tailored to explore the participant’s questionnaire data. The general questions were used to gain insight into participants’ knowledge, attitudes, and perception of their learning experience in their education program. The general questions included a discussion of the participants’ practicums and if they worked with students with ADHD; they were asked questions that would delve into their attitudes of working with those students. When discussing knowledge, participants were asked how coursework helped to prepare them, as well as asking participants what they wished they could have learned more about. Some of the types of general questions used were related to the participants’ experiences and behaviours, knowledge, and background/demographics. Due to the semi-structured nature of the interview, some probing and additional interview questions were asked while the interview was taking place. See the appendix for interview protocol.
Two think-aloud vignettes were conducted during the one-on-one interviews. Vignettes invited participants to respond to situations using normative statements in response to social circumstances, instead of them feeling pressured to discuss their personal beliefs, attitudes, or opinions (Finch, 1987). The first vignette described a young undiagnosed female, her personality, and classroom behaviour. The vignette was designed to examine the teachers’ content knowledge of ADHD as well as their attitude towards the student in the vignette. The participant was asked to explain his/her reaction towards the student’s behaviour, if he/she felt ADHD symptoms were present, if he/she felt ADHD symptoms would be different if the student were a male, what difficulties this student may face in the classroom, and how pre-service teachers could help this student as an teacher. The second vignette described a male student and the relationship between the male student and his male teacher. The vignette was designed to examine the pre-service teachers’ locus of control, while further examining the participant’s perception of the student. The participants were asked to describe the teacher-student relationship in the vignette, to describe whether they felt the relationship was positive or negative, how they felt the teacher perceived the students behaviour and attitude, what they thought the teacher was thinking in this scenario, and how they would react as an educator to having this student in their classroom.

Conduction of interviews. Before the interviews began, the researcher gave a brief introduction to the study, its purpose, and the expectations of the participant. The participants were reminded that the information discussed was confidential. Participants were also told that there would be no identifying information when the results were written, and that they were able to withdraw from the interview at any time. However, no participant withdrew from the study and no participant asked for any partial deletion of his or her information. The participants were also reminded that the interview was being audio-recorded for transcription purposes at a later date.
The interviewer began the interview by asking the participants about their reasoning for choosing to go into the teaching profession, why they chose primary/junior to specialize in, and what has surprised them so far about their Bachelor of Education journey. After the introductory questions were answered, the participants were asked to describe their practicum experiences and whether they felt or knew if they had students with ADHD in their classes. This question introduced them to the topic of ADHD and got them to start thinking back to their coursework and practicum experiences. Both of these experiences would be necessary for them to answer the following interview questions. The questions for the remainder of the interview were based off of the participants’ individual questionnaire results. The participants were asked to expand on their answers, and to discuss if there were certain experiences in their Bachelor of Education program that led to their change in opinions and thinking from time 1 to time 2.

Data Analysis

When analyzing the interviews, inductive coding analysis was used to organize the data into categories, while identifying themes, patterns, and relationships among the categories (Thomas, 2006). Inductive analysis is important because it allows for more general themes and conclusions to emerge from the data, rather than being predetermined or having imposed any bias prior to data collection (Thomas, 2006).

Transcribing the data. The interviews were transcribed verbatim by the researcher using Microsoft Word. Words such as ‘like’, ‘um’, ‘ah’, were left in the transcription to help to show the participants’ thought process. The transcriptions were member checked by each participant, edited by the researcher, and then printed for multiple readings by the researcher. Based upon feedback after participants were sent copies, participants had no substantial feedback on their responses and there was no clarification or immense edits. Very limited edits, which consisted of small clarifications, were present.
Open coding. The open-coding process began by reading and re-reading the three transcriptions. This allowed the researcher to gain a conceptual understanding of the transcriptions and to begin reflecting on the data. The researcher constructed descriptive open codes. Codes were developed for each major heading in the questionnaire: knowledge, attitudes, and perceptions, with the vignette data also being analyzed under these headings. The researcher first went line-by-line analyzing, then went through the data a second time and created codes through the analysis of sentences and paragraphs of the participants’ responses. Each of the codes was written in the margins of the interview transcriptions. Each transcription had three different colours of highlighter, to represent codes for the three major headings: knowledge, attitudes, and perceptions. Throughout the open coding process, the researcher also wrote memos noting the unique emphasis of each participant, reoccurring patterns, and reflective questions to consider further into the analysis process.

Axial coding. To begin the axial coding process, the researcher wrote down all of the open codes for each individual participant. The axial coding process began with reassembling the open codes to assess what codes could be linked due to similarities.

Themes. Next, the researcher analyzed the categories looking for similarities, in order to create themes based on those common properties. An individual concept-map was made for each participant to represent each heading (knowledge, attitudes, perceptions). Concept-maps were created to help organize the categories into themes. Once the axial coding had concluded, the researcher organized the categories into groups to assist in creating themes. There was an average of four themes per heading (knowledge, attitudes, and perceptions). The results section that follows presents these themes in further detail. The similarities and differences between the interview participants’ responses are also found in the results chapter.
Integrative Analysis of Phase 1 and Phase 2:

At the point of making inferences, the questionnaire and interview data sets and results were explored simultaneously in order to provide a more powerful insight about the change process than either data set could have produced alone (Caracelli et al, 1993). Mixing of the data consisted of integrating the two databases by merging the questionnaire data with the interview data (Creswell, 2009). By combining the two data sets during the interpretation stage, the study was able to discover similarities among the results.
CHAPTER 4

RESULTS

The objective of this mixed-method study was to examine whether coursework and practicum experiences influence primary/junior pre-service teachers’ knowledge, attitudes, and perceptions of including students with ADHD in the general education classroom. More specifically, what underlined this change in pre-service teachers’ knowledge, attitudes, and perceptions of including students with ADHD in the general education classroom? This chapter includes the findings based on A) phase 1 questionnaire data: Time 1 data that was completed after summer coursework and before their first 6-week teaching practicum in their fall semester, and Time 2 data which was completed post-practicum experience B) phase 2 interview data: one-on-one interview data that was completed in February before the pre-service teachers second teaching practicum. This chapter presents the results of this study, which are split into two sections: questionnaire and interview.

Questionnaire Results

A total number of 28 participants completed the questionnaire at both time 1 and time 2. Three categories were used to analyze the questionnaire data: knowledge, attitudes, and perceptions. Time 1 data will be presented first, followed by time 2 data.

Time 1

Knowledge. Frequency calculations were conducted to examine participants’ knowledge of ADHD. Results are presented in Table 1. Sixty-four percent of participants felt that ADHD was a real diagnosis and not a social construct, whereas 29% of participants felt that ADHD was not a real diagnosis and was a social construct. As well, 53% of participants disagreed that special diet (e.g.,
Table 1
*Time 1: Pre-Service Teachers Knowledge of ADHD; Frequencies and Percentages of Responses*

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Don’t Know</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHD is not a real diagnosis, but instead a social construct</td>
<td>13 (46.4%)</td>
<td>5 (17.9%)</td>
<td>2 (7.1%)</td>
<td>5 (17.9%)</td>
<td>3 (10.7%)</td>
</tr>
<tr>
<td>Special diets (e.g., reduced sugar, no food colouring, wheat free,</td>
<td>10 (35.7%)</td>
<td>5 (17.9%)</td>
<td>7 (25%)</td>
<td>6 (21.4%)</td>
<td>0</td>
</tr>
<tr>
<td>lactose free, additive free) are an effective treatment for ADHD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There are several subtypes of ADHD, which can present themselves in</td>
<td>2 (7.1%)</td>
<td>0</td>
<td>6 (21.4%)</td>
<td>9 (32.1%)</td>
<td>11 (39.3%)</td>
</tr>
<tr>
<td>different behaviour manifestations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children with ADHD can choose to be better behaved</td>
<td>9 (32.1%)</td>
<td>12 (42.9%)</td>
<td>3 (10.7%)</td>
<td>3 (10.7%)</td>
<td>1 (3.6%)</td>
</tr>
<tr>
<td>Children who have predominantly hyperactive-type of ADHD often talk</td>
<td>0</td>
<td>5 (17.9%)</td>
<td>2 (7.1%)</td>
<td>11 (39.3%)</td>
<td>10 (35.7%)</td>
</tr>
<tr>
<td>excessively and also have difficulty staying in their seat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor Parenting and not enough discipline can cause ADHD</td>
<td>19 (67.9%)</td>
<td>4 (14.3%)</td>
<td>1 (3.6%)</td>
<td>4 (14.3%)</td>
<td>0</td>
</tr>
<tr>
<td>Children who present ADHD behaviours, regardless of ADHD diagnosis,</td>
<td>1 (3.6%)</td>
<td>0</td>
<td>4 (14.3%)</td>
<td>9 (32.1%)</td>
<td>14 (50%)</td>
</tr>
<tr>
<td>can benefit from individualized behaviour management strategies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some children can present ADHD-type behaviours, such as inattentiveness</td>
<td>2 (7.1%)</td>
<td>0</td>
<td>4 (14.3%)</td>
<td>7 (25%)</td>
<td>15 (53.6%)</td>
</tr>
<tr>
<td>or hyperactivity, yet not meet the criteria for an ADHD diagnosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children with ADHD often fail to give close attention to their work,</td>
<td>1 (3.6%)</td>
<td>9 (32.1%)</td>
<td>5 (17.9%)</td>
<td>10 (35.7%)</td>
<td>3 (10.7%)</td>
</tr>
<tr>
<td>leading to careless mistakes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

reduced sugar, no food colouring, wheat free, lactose free, additive free) were an effective treatment for ADHD, with approximately 21% of participants responded that special diets were
an effective treatment for ADHD. Eighty-two percent of participants disagreed that poor parenting and not enough discipline caused ADHD, while only 14% of participants agreed that poor parenting and not enough discipline caused ADHD.

Seventy-one percent of participants believed that there are several subtypes of ADHD, which can present themselves in different behavioural manifestations; however, 21% of participants were unsure if there were several subtypes of ADHD and 7% of participants strongly disagreed that there are several subtypes of ADHD, which can be presented in different manifestations. When asked whether children with ADHD can choose to be better behaved, 75% of participants disagreed with this statement, while 14% of participants agreed that children with ADHD could choose to be better behaved. Further, 75% of participants agreed that children who have predominately hyperactive-type of ADHD often talk excessively and also have difficulty staying in their seat, while 18% of participants disagreed that children who have a predominately hyperactive-type of ADHD often talk excessively and also have difficulty staying in their seat.

When describing if children with ADHD often fail to give close attention to their work, leading to careless mistakes, 36% of participants disagreed, while 46% agreed. However, 18% of participants were unsure if not paying attention to their work, could cause careless mistakes for students with ADHD. Pre-service teachers were also asked about ADHD as a diagnosis. Eighty-two percent of participants agreed that children who present ADHD behaviours, regardless of ADHD diagnosis, could benefit from individualized behaviour management strategies, while only 4% of participants disagreed, and 14% were unsure. Finally, when asked whether or not some children could present ADHD-type behaviours, such as inattentiveness or hyperactivity, yet not meet the criteria for an ADHD diagnosis, 78% agreed, 14% were unsure, and 7% disagreed.

**Attitudes** Frequency calculations were conducted to examine participants’ attitudes of ADHD, in particular, their attitudes towards behaviours associated with ADHD, classroom
implications for students with ADHD, and their attitudes towards teaching students with ADHD. Results are presented in Table 2. Eighty-two percent of pre-service teachers felt that ADHD is a valid exceptionality, while 11% disagreed with this statement, leaving 7% of pre-service teachers unsure if ADHD was a valid exceptionality. When asked if having a student with ADHD was a social benefit to the other students in the pre-service teachers’ classroom, 48% agreed, 15% disagreed and 37% were not sure. Sixty-eight percent of pre-service teachers disagreed with the statement that supporting students with ADHD restricted them from supporting the other needs in their classroom, while 29% agreed with this statement, and 3% were unsure if supporting students with ADHD restricted them from supporting the other needs in their classroom. Forty-six percent of pre-service teachers felt that students who display ADHD-type behaviours caused them to experience stress, while 43% disagreed with this statement, and 11% of pre-service teachers were unsure if teaching students with ADHD-type behaviours would cause them to experience stress.

When asked about the implementation of accommodations for students who exhibit behaviours associated with ADHD and whether these implementations were easy to implement, 36% of pre-service teachers disagreed, 50% agreed, and 14% were unsure. Ninety percent of pre-service teachers disagreed with the statement that children who exhibit behaviours associated with ADHD misbehave because they do not want to follow classroom rules, with 7% of participants unsure if children who exhibit behaviours associated with ADHD misbehave because they do not want to follow classroom rules. Seventy-five percent of pre-service teachers felt that they needed to consider changing their teaching styles to support the individual needs of students with ADHD in their classroom, while 7% disagreed with this statement, and 18% were unsure if they needed to change their teaching styles to support the individual needs of students with ADHD in their classroom.
### Table 2

*Time 1: Pre-Service Teachers’ Attitudes; Frequencies and Percentages of Responses*

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Don’t Know</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I believe ADHD is a valid exceptionality</td>
<td>2 (7.1%)</td>
<td>1 (3.6%)</td>
<td>2 (7.1%)</td>
<td>6 (21.4%)</td>
<td>17 (60.7%)</td>
</tr>
<tr>
<td>Having a student with ADHD is a social benefit to the other students in my classroom</td>
<td>2 (7.4%)</td>
<td>2 (7.4%)</td>
<td>10 (37%)</td>
<td>12 (44.4%)</td>
<td>1 (3.7%)</td>
</tr>
<tr>
<td>Students who display ADHD-type behaviours cause me to experience stress</td>
<td>5 (17.9%)</td>
<td>7 (25%)</td>
<td>3 (10.7%)</td>
<td>11 (39.3%)</td>
<td>2 (7.1%)</td>
</tr>
<tr>
<td>Accommodations for students who exhibit behaviours associated with ADHD are easy to implement in a general education classroom</td>
<td>1 (3.6%)</td>
<td>9 (32.1%)</td>
<td>3 (14.3%)</td>
<td>12 (42.9%)</td>
<td>2 (7.1%)</td>
</tr>
<tr>
<td>Children who exhibit behaviours associated with ADHD misbehave because they do not want to follow classroom rules</td>
<td>14 (50%)</td>
<td>11 (40.7%)</td>
<td>2 (7.4%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>I have received adequate professional training in my B.Ed. about managing ADHD-type behaviours</td>
<td>8 (28.6%)</td>
<td>9 (32.1%)</td>
<td>4 (14.3%)</td>
<td>7 (25%)</td>
<td>0</td>
</tr>
<tr>
<td>I feel I have enough knowledge about ADHD classroom interventions in order to manage ADHD-type behaviours</td>
<td>5 (17.9%)</td>
<td>13 (46.4%)</td>
<td>1 (3.6%)</td>
<td>9 (32.1%)</td>
<td>0</td>
</tr>
<tr>
<td>I need to consider changing my teaching style to support the individual needs of students with ADHD in the classroom</td>
<td>1 (3.6%)</td>
<td>1 (3.6%)</td>
<td>5 (17.9%)</td>
<td>13 (46.4%)</td>
<td>8 (28.6%)</td>
</tr>
<tr>
<td>Supporting students with ADHD restricts me from supporting the other needs in my classroom</td>
<td>11 (39.3%)</td>
<td>8 (28.6%)</td>
<td>1 (3.6%)</td>
<td>7 (25%)</td>
<td>1 (3.6%)</td>
</tr>
<tr>
<td>I feel I have enough knowledge about ADHD-type behaviours</td>
<td>6 (21.4%)</td>
<td>12 (42.9%)</td>
<td>4 (14.3%)</td>
<td>5 (17.9%)</td>
<td>1 (3.6%)</td>
</tr>
</tbody>
</table>
Initial results suggested that a majority of pre-service teachers felt that they had not received adequate professional training in their Bachelor of Education program in managing ADHD-type behaviours; 60% disagreed that they had received adequate training, with 14% unsure if they had received adequate training and 25% agreeing that they had received adequate training in managing ADHD-type behaviours. Further, when asked if the pre-service teachers’ felt they had enough knowledge about ADHD classroom interventions in order to manage ADHD-type behaviours, 64% disagreed, 32% agreed, and 4% were unsure if they had enough knowledge about ADHD classroom interventions in order to manage ADHD-type behaviours. Finally, when asked whether the pre-service teachers felt they had enough knowledge about ADHD-type behaviours, 22% agreed they did have enough knowledge, 14% were unsure, and 64% disagreed that they had enough knowledge about ADHD-type behaviours.

Perceptions Frequency calculations were conducted to examine participants’ perceptions of ADHD. More specifically, pre-service teachers’ perceived roles of a teacher in regards to teaching and accommodating students with ADHD, and pre-service teachers’ perceptions of ADHD-type behaviours in the classroom. Results are presented in Table 3. When asked whether interventions made by classroom teachers were sufficient alone to deal with severe behavioural problems, 75% of per-service teachers disagreed, while 4% agreed, and 21% were unsure if interventions made by classroom teachers were sufficient alone to deal with severe behavioural problems. Seventy-five percent of pre-service teachers agreed that peers were an effective learning support for students with ADHD, while 7% disagreed, and 18% did not know if peers were an effective learning support for students with ADHD. Further, when pre-service teachers were asked whether they felt that the behaviours exhibited by students with ADHD restricted their development of successful friendships, 54% disagreed, 7% were unsure, and 39% agreed that the behaviour exhibited by students with ADHD restricts their development of successful
friendships.

Table 3
*Time 1: Pre-Service Teachers’ Perceptions; Frequencies and Percentages of Responses*

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Don’t Know</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interventions made by classroom teachers are sufficient alone to deal with severe behavioural problems</td>
<td>8 (28.6%)</td>
<td>13 (46.4%)</td>
<td>6 (21.4%)</td>
<td>0</td>
<td>1 (3.6%)</td>
</tr>
<tr>
<td>Peers are an effective learning support for students with ADHD</td>
<td>1 (3.6%)</td>
<td>1 (3.6%)</td>
<td>5 (17.9%)</td>
<td>15 (53.6%)</td>
<td>6 (21.4%)</td>
</tr>
<tr>
<td>Assessment does not need to be differentiated for students with ADHD</td>
<td>6 (21.4%)</td>
<td>17 (60.7%)</td>
<td>2 (7.1%)</td>
<td>2 (7.1%)</td>
<td>1 (3.6%)</td>
</tr>
<tr>
<td>All students with ADHD exhibit hyperactive behaviour</td>
<td>12 (42.9%)</td>
<td>11 (39.3%)</td>
<td>2 (7.1%)</td>
<td>3 (10.7%)</td>
<td>0</td>
</tr>
<tr>
<td>Task engagement is not necessary for students with ADHD to succeed academically</td>
<td>12 (33.3%)</td>
<td>12 (33.3%)</td>
<td>7 (19.4%)</td>
<td>4 (11.1%)</td>
<td>1 (2.8%)</td>
</tr>
<tr>
<td>The behaviours exhibited by students with ADHD restrict their development of successful friendships</td>
<td>8 (28.6%)</td>
<td>7 (25%)</td>
<td>2 (7.1%)</td>
<td>11 (39.3%)</td>
<td>0</td>
</tr>
<tr>
<td>Teachers can assist students with ADHD to ignore distractions in order to stay focused during class activities</td>
<td>0</td>
<td>9 (33.3%)</td>
<td>4 (14.8%)</td>
<td>12 (44.4%)</td>
<td>2 (7.4%)</td>
</tr>
<tr>
<td>Students with ADHD need to be formally diagnosed before teachers can provide adaptations in the classroom</td>
<td>16 (57.1%)</td>
<td>9 (32.1%)</td>
<td>1 (3.6%)</td>
<td>2 (7.1%)</td>
<td>0</td>
</tr>
<tr>
<td>Teachers need assistance from other professionals (E.g. educational assistant, doctor) in order to effectively support students with ADHD</td>
<td>0</td>
<td>8 (28.6%)</td>
<td>3 (10.7%)</td>
<td>13 (46.4%)</td>
<td>4 (14.3%)</td>
</tr>
<tr>
<td>Hyperactive/Impulsive behaviours disappear over time</td>
<td>7 (25%)</td>
<td>11 (39.3%)</td>
<td>8 (28.6%)</td>
<td>2 (7.1%)</td>
<td>0</td>
</tr>
<tr>
<td>Inattentive behaviours disappear over time</td>
<td>7 (25%)</td>
<td>12 (42.9%)</td>
<td>8 (28.6%)</td>
<td>1 (3.6%)</td>
<td>0</td>
</tr>
</tbody>
</table>
Pre-service teachers’ were asked about their perceptions of a teacher’s role when working with students who have ADHD. When asked if teachers were able to assist students with ADHD in ignoring distractions in order to help the students stay focused during class activities, 33% of pre-service teachers disagreed, 15% were unsure, and 52% agreed that as teachers they were able to assist their student with ADHD in ignoring distractions to help them stay focused on the classroom activity. Eighty-six percent of pre-service teachers disagreed that students with ADHD needed to be formally diagnosed before teachers can provide adaptations in the classroom, while 3% were unsure if the student needed to be diagnosed before a teacher can provide adaptations, and 7% agreed that a student with ADHD must be formally diagnosed before a teacher can provide adaptations in the classroom. When asked if teachers need assistance from other professionals (e.g., educational assistants, doctors) in order to support students with ADHD effectively, 60% of pre-service teachers agreed that assistance from other professionals was needed to effectively support students with ADHD. However, 29% disagreed that professional assistance was necessary to support students with ADHD effectively and 11% were unsure. Eighty-two percent of pre-service teachers disagreed with the statement that assessment did not need to be differentiated for students with ADHD, while 11% agreed that assessment did not need to be differentiated for students with ADHD, with 7% unsure if assessment needed to be differentiated for students with ADHD. Pre-service teachers were then asked if they perceived task engagement to not be necessary for students with ADHD to succeed academically. Fourteen percent agreed that task engagement was not necessary for students with ADHD to succeed academically, while 19% were unsure if task engagement is necessary, and 67% of pre-service disagreed that task engagement was not necessary for students with ADHD to succeed academically.
Finally, pre-service teachers were asked how they perceived ADHD-type behaviours. More specifically, pre-service teachers were asked if they felt that all students with ADHD exhibited hyperactive behaviours. Eighty-two percent of pre-service teachers disagreed that all students with ADHD exhibit hyperactive behaviours, while 7% were unsure, and 11% agreed that all students with ADHD exhibit hyperactive behaviours. Pre-service teachers were then asked if they perceived hyperactive/impulsive behaviours to disappear over time; 64% disagreed that hyperactive/impulsive behaviours disappear over time, 29% were unsure, and 7% agreed that hyperactive/impulsive behaviours did disappear over time. Sixty-eight percent of pre-service teachers disagreed that inattentive behaviour tended to disappear over time, with 29% of pre-service teachers being unsure if they disappeared, and 3% agreeing that the inattentive behaviours did disappear over time.

**Time 2**

The same questionnaire distributed at Time 1 was also distributed after participants completed their fall practicum. Similar to Time 1 data, results are presented in order of knowledge, attitudes, and perceptions.

**Knowledge** Frequency calculations were conducted to examine participants’ knowledge of ADHD. Results are presented in Table 4. Eighty-six percent of participants felt that ADHD was a real diagnosis, whereas only 10% felt that ADHD is a social construct, leaving 4% to be unsure if ADHD was a social construct and not a real diagnosis. As well, 43% of participants disagreed that special diets (e.g., reduced sugar, no food colouring, wheat free, lactose free, additive free) were an effective treatment for ADHD, with approximately 32% of participants agreeing that special diets were an effective treatment for ADHD, and 25% of participants unsure if special diets were an effective treatment for ADHD. Seventy-nine percent of participants disagreed that poor parenting and not enough discipline caused ADHD, while 18% of participants
agreed that poor parenting and not enough discipline causes ADHD, with 4% of participants unsure if there was a correlation.

Table 4
*Time 2: Pre-Service Teachers’ Knowledge; Frequencies and Percentages of Responses*

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Don’t Know</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHD is not a real diagnosis, but instead a social construct</td>
<td>15 (53.6%)</td>
<td>9 (32.1%)</td>
<td>1 (3.6%)</td>
<td>2 (7.1%)</td>
<td>1 (3.6%)</td>
</tr>
<tr>
<td>Special diets (e.g., reduced sugar, no food colouring, wheat free, lactose free, additive free) are an effective treatment for ADHD</td>
<td>8 (28.6%)</td>
<td>4 (14.3%)</td>
<td>7 (25%)</td>
<td>9 (32%)</td>
<td>0</td>
</tr>
<tr>
<td>There are several subtypes of ADHD, which can present themselves in different behaviour manifestations</td>
<td>2 (7.1%)</td>
<td>0</td>
<td>7 (25%)</td>
<td>5 (17.9%)</td>
<td>14 (50%)</td>
</tr>
<tr>
<td>Children with ADHD can choose to be better behaved</td>
<td>8 (29.6%)</td>
<td>14 (51.9%)</td>
<td>2 (7.4%)</td>
<td>2 (7.4%)</td>
<td>1 (3.7%)</td>
</tr>
<tr>
<td>Children who have predominantly hyperactive-type of ADHD often talk excessively and also have difficulty staying in their seat</td>
<td>0</td>
<td>3 (10.7%)</td>
<td>4 (14.3%)</td>
<td>13 (46.4%)</td>
<td>8 (28.6%)</td>
</tr>
<tr>
<td>Poor Parenting and not enough discipline can cause ADHD</td>
<td>20 (71.4%)</td>
<td>2 (7.1%)</td>
<td>1 (3.6%)</td>
<td>4 (14.3%)</td>
<td>1 (3.6%)</td>
</tr>
<tr>
<td>Children who present ADHD behaviours, regardless of ADHD diagnosis, can benefit from individualized behaviour management strategies</td>
<td>1 (3.6%)</td>
<td>1 (3.6%)</td>
<td>1 (3.6%)</td>
<td>9 (32.1%)</td>
<td>16 (57.1%)</td>
</tr>
<tr>
<td>Some children can present ADHD-type behaviours, such as inattentiveness or hyperactivity, yet not meet the criteria for an ADHD diagnosis</td>
<td>0</td>
<td>1 (3.6%)</td>
<td>2 (7.1%)</td>
<td>9 (32.1%)</td>
<td>16 (57.1%)</td>
</tr>
<tr>
<td>Children with ADHD often fail to give close attention to their work, leading to careless mistakes</td>
<td>0</td>
<td>9 (32.1%)</td>
<td>7 (25%)</td>
<td>8 (28.6%)</td>
<td>4 (14.3%)</td>
</tr>
</tbody>
</table>
Sixty-eight percent of participants believed that there were several subtypes of ADHD, which can present themselves in different behavioural manifestations; however, 25% of participants were unsure if there were several subtypes of ADHD and 7% of participants strongly disagreed that there were several subtypes of ADHD, which could be presented in different manifestations. When asked whether children with ADHD could choose to be better behaved, 82% of participants disagreed with this statement, while 11% of participants agreed, and 7% were unsure if children with ADHD could choose to be better behaved. Further, 75% of participants agreed that children who have predominately hyperactive-type of ADHD often talk excessively and also have difficulty staying in their seat, while 10% of participants disagreed, and 14% were unsure if children who have a predominately hyperactive-type of ADHD often talk excessively and have difficulty staying in their seat.

When describing if children with ADHD often fail to give close attention to their work, leading to careless mistakes, 32% of participants disagreed, while 42% agreed. However, 25% did not know if not paying attention to their work caused careless mistakes for students with ADHD. Pre-service teachers were also asked about ADHD as a diagnosis. Eighty-nine percent of participants agreed that children who present ADHD behaviours, regardless of ADHD diagnosis, could benefit from individualized behaviour management strategies, while 7% of participants disagreed, and 4% were unsure. Finally, when asked whether or not some children could present ADHD-type behaviours, such as inattentiveness or hyperactivity, yet not meet the criteria for an ADHD diagnosis, 89% agreed, 7% were unsure, and 4% disagreed.

**Attitudes** Frequency calculations were conducted to examine participants’ attitudes towards behaviours associated with ADHD, classroom implications for students with ADHD, and their attitudes towards teaching students with ADHD. Results are presented in Table 5. Ninety-
three percent of pre-service teachers felt that ADHD is a valid exceptionality, while 7% disagreed with this statement. When asked if having a student with ADHD was a social benefit to the other

Table 5
*Time 2: Pre-Service Teachers’ Attitudes; Frequencies and Percentages of Responses*

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Don’t Know</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I believe ADHD is a valid exceptionality</td>
<td>1 (3.6%)</td>
<td>1 (3.6%)</td>
<td>0</td>
<td>6 (21.4%)</td>
<td>20 (71.4%)</td>
</tr>
<tr>
<td>Having a student with ADHD is a social benefit to the other students in my classroom</td>
<td>3 (10.7%)</td>
<td>4 (14.3%)</td>
<td>4 (14.3%)</td>
<td>16 (57.1%)</td>
<td>1 (3.6%)</td>
</tr>
<tr>
<td>Students who display ADHD-type behaviours cause me to experience stress</td>
<td>3 (10.7%)</td>
<td>9 (32.1%)</td>
<td>0</td>
<td>14 (50%)</td>
<td>2 (7.1%)</td>
</tr>
<tr>
<td>Accommodations for students who exhibit behaviours associated with ADHD are easy to implement in a general education classroom</td>
<td>0</td>
<td>11 (40.7%)</td>
<td>2 (7.1%)</td>
<td>13 (48.1%)</td>
<td>1 (3.7%)</td>
</tr>
<tr>
<td>Children who exhibit behaviours associated with ADHD misbehave because they do not want to follow classroom rules</td>
<td>15 (53.6%)</td>
<td>10 (35.7%)</td>
<td>1 (3.6%)</td>
<td>2 (7.1%)</td>
<td>0</td>
</tr>
<tr>
<td>I have received adequate professional training in my B.Ed. about managing ADHD-type behaviours</td>
<td>8 (28.6%)</td>
<td>12 (42.9%)</td>
<td>4 (14.3%)</td>
<td>3 (10.7%)</td>
<td>1 (3.6%)</td>
</tr>
<tr>
<td>I feel I have enough knowledge about ADHD classroom interventions in order to manage ADHD-type behaviours</td>
<td>6 (21.4%)</td>
<td>11 (39.3%)</td>
<td>6 (21.4%)</td>
<td>5 (17.9%)</td>
<td>0</td>
</tr>
<tr>
<td>I need to consider changing my teaching style to support the individual needs of students with ADHD in the classroom</td>
<td>1 (3.6%)</td>
<td>4 (14.3%)</td>
<td>7 (25%)</td>
<td>13 (46.4%)</td>
<td>3 (10.7%)</td>
</tr>
<tr>
<td>Supporting students with ADHD restricts me from supporting the other needs in my classroom</td>
<td>6 (21.4%)</td>
<td>12 (42.9%)</td>
<td>2 (7.1%)</td>
<td>6 (21.4%)</td>
<td>2 (7.1%)</td>
</tr>
<tr>
<td>I feel I have enough knowledge about ADHD-type behaviours</td>
<td>7 (25%)</td>
<td>10 (35.7%)</td>
<td>4 (14.3%)</td>
<td>6 (21.4%)</td>
<td>1 (3.6%)</td>
</tr>
</tbody>
</table>
students in the pre-service teachers’ classroom, 60% agreed, 25% disagreed and 14% were not sure. Sixty-four percent of pre-service teachers disagreed with the statement that supporting students with ADHD restricted them from supporting the other needs in their classroom, while 29% agreed with this statement, and 7% were unsure if supporting students with ADHD restricted them from supporting the other needs in their classroom. Fifty-seven percent of pre-service teachers felt that students who display ADHD-type behaviours caused them to experience stress, while 43% disagreed with this statement.

When asked about the implementation of accommodations for students who exhibit behaviours associated with ADHD and whether these implementations are easy to implement, 43% of pre-service teachers disagreed, 50% agreed, and 7% were unsure. Eighty-nine percent of pre-service teachers disagreed with the statement children who exhibited behaviours associated with ADHD misbehaved because they did not want to follow classroom rules, with 7% agreeing, and 4% of participants unsure if children who exhibited behaviours associated with ADHD misbehaved because they did not want to follow classroom rules. Fifty-seven percent of pre-service teachers felt that they needed to consider changing their teaching styles to support the individual needs of students with ADHD in their classroom, while 18% disagreed with this statement, and 25% were unsure if they needed to change their teaching styles to support the individual needs of students with ADHD in their classroom.

When discussing professional training in their Bachelor of Education program in managing ADHD-type behaviours, 71% disagreed that they had received adequate training, with 14% unsure if they had received adequate training and 14% agreeing that they had received adequate training in managing ADHD-type behaviours. Further, when asked if the pre-service teachers’ felt they had enough knowledge about ADHD classroom interventions in order to manage ADHD-type behaviours, 60% disagreed, 18% agreed, and 21% were unsure if they had
enough knowledge about ADHD classroom interventions in order to manage ADHD-type behaviours. Finally, when asked whether the pre-service teachers felt they had enough knowledge about ADHD-type behaviours, 25% agreed they did have enough knowledge, 14% were unsure, and 60% disagreed that they had enough knowledge about ADHD-type behaviours.

**Perceptions** Frequency calculations were conducted to examine participants’ perceptions of ADHD. More specifically, how pre-service teachers’ perceived the role of a teacher in regards to teaching and accommodating students with ADHD, and how pre-service teachers’ perceived ADHD-type behaviours in the classroom. Pre-service teachers’ perceptions of ADHD are represented in Table 6. When asked whether interventions made by classroom teachers were sufficient alone to deal with severe behavioural problems, 92% of per-service teachers disagreed, while 4% agreed, and 4% were unsure if interventions made by classroom teachers were sufficient alone to deal with severe behavioural problems. Seventy-five percent of pre-service teachers agreed that peers were an effective learning support for students with ADHD, while 11% disagreed, and 14% did not know if peers were an effective learning support for students with ADHD. Further, when pre-service teachers were asked whether they felt that the behaviours exhibited by students with ADHD restricted their development of successful friendships, 57% disagreed, 18% were unsure, and 25% agreed that the behaviour exhibited by students with ADHD restricts their development of successful friendships.

Pre-service teachers’ were asked about their perceptions of a teacher’s role when working with students who have ADHD. When asked if teachers were able to assist students with ADHD in ignoring distractions in order to help the students stay focused during class activities, 18% of pre-service teachers disagreed, 14% were unsure, and 68% agreed that teachers were are able to assist his/her student with ADHD in ignoring distractions to help him/her stay focused on the classroom activity. Eighty-nine percent of pre-service teachers disagreed that students with
ADHD needed to be formally diagnosed before teachers could provide adaptations in the classroom, while 7% were unsure if the student needed to be diagnosed before a teacher can

Table 6
Time 2: Pre-Service Teachers’ Perceptions; Frequencies and Percentages of Responses

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Don’t Know</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interventions made by classroom teachers are sufficient alone to deal with severe behavioural problems</td>
<td>13 (46.4%)</td>
<td>13 (46.4%)</td>
<td>1 (3.6%)</td>
<td>1 (3.6%)</td>
<td>0</td>
</tr>
<tr>
<td>Peers are an effective learning support for students with ADHD</td>
<td>2 (7.1%)</td>
<td>1 (3.6%)</td>
<td>4 (14.3%)</td>
<td>17 (60.7%)</td>
<td>4 (14.3%)</td>
</tr>
<tr>
<td>Assessment does not need to be differentiated for students with ADHD</td>
<td>8 (28.6%)</td>
<td>15 (53.6%)</td>
<td>2 (7.1%)</td>
<td>3 (10.7%)</td>
<td>0</td>
</tr>
<tr>
<td>All students with ADHD exhibit hyperactive behaviour</td>
<td>14 (50%)</td>
<td>9 (32.1%)</td>
<td>2 (7.1%)</td>
<td>2 (7.1%)</td>
<td>1 (3.6%)</td>
</tr>
<tr>
<td>Task engagement is not necessary for students with ADHD to succeed academically</td>
<td>12 (42.9%)</td>
<td>8 (28.6%)</td>
<td>7 (25%)</td>
<td>1 (3.6%)</td>
<td>0</td>
</tr>
<tr>
<td>The behaviours exhibited by students with ADHD restrict their development of successful friendships</td>
<td>2 (7.1%)</td>
<td>14 (50%)</td>
<td>5 (17.9%)</td>
<td>5 (17.9%)</td>
<td>2 (7.1%)</td>
</tr>
<tr>
<td>Teachers can assist students with ADHD to ignore distractions in order to stay focused during class activities</td>
<td>0</td>
<td>5 (17.9%)</td>
<td>4 (14.3%)</td>
<td>17 (60.7%)</td>
<td>2 (7.1%)</td>
</tr>
<tr>
<td>Students with ADHD need to be formally diagnosed before teachers can provide adaptations in the classroom</td>
<td>17 (60.7%)</td>
<td>8 (28.6%)</td>
<td>2 (7.1%)</td>
<td>1 (3.6%)</td>
<td>0</td>
</tr>
<tr>
<td>Teachers need assistance from other professionals (E.g. educational assistant, doctor) in order to effectively support students with ADHD</td>
<td>0</td>
<td>6 (21.4%)</td>
<td>3 (10.7%)</td>
<td>8 (28.6%)</td>
<td>11 (39.3%)</td>
</tr>
<tr>
<td>Hyperactive/Impulsive behaviours disappear over time</td>
<td>8 (28.6%)</td>
<td>7 (25%)</td>
<td>10 (35.7%)</td>
<td>3 (10.7%)</td>
<td>0</td>
</tr>
<tr>
<td>Inattentive behaviours disappear over time</td>
<td>7 (25%)</td>
<td>10 (35.7%)</td>
<td>10 (35.7%)</td>
<td>1 (3.6%)</td>
<td>0</td>
</tr>
</tbody>
</table>
provide adaptations, and 4% agreed that a student with ADHD must be formally diagnosed before a teacher could provide adaptations in the classroom. When asked if teachers needed assistance from other professionals (e.g., educational assistants, doctors) in order to support students with ADHD effectively, 68% of pre-service teachers agreed that assistance from other professionals was needed to support students with ADHD effectively. However, 21% disagreed that professional assistance was necessary to support students with ADHD effectively and 11% were unsure. Eighty-two percent of pre-service teachers disagreed with the statement that assessment did not need to be differentiated for students with ADHD, while 10% agreed that assessment did not need to be differentiated for students with ADHD, leaving 7% to be unsure if assessment needed to be differentiated for students with ADHD. Pre-service teachers were then asked if they perceived task engagement to not be necessary for students with ADHD to succeed academically. Four percent agreed that task engagement was not necessary for students with ADHD to succeed academically, while 25% were unsure if task engagement was necessary, and 71% of pre-service disagreed that task engagement was not necessary for students with ADHD to succeed academically.

Finally, pre-service teachers were asked how they perceived ADHD-type behaviours. More specifically, pre-service teachers were asked if they felt that all students with ADHD exhibited hyperactive behaviours. Eighty-two percent of pre-service teachers disagreed that all students with ADHD exhibited hyperactive behaviours, while 7% were unsure, and 11% agreed that all students with ADHD exhibited hyperactive behaviours. Pre-service teachers were then asked if they perceived hyperactive/impulsive behaviours to disappear over time; 54% disagreed that hyperactive/impulsive behaviours disappear over time, 36% were unsure, and 10% agreed that hyperactive/impulsive behaviours do disappear over time. Sixty-one percent of pre-service
teachers disagreed that inattentive behaviour to disappear over time, with 36% of pre-service teachers being unsure if they disappeared, and 4% agreeing that the inattentive behaviours do disappear over time.

Changes Across Time 1 and Time 2

Significant changes. The next stage of data analysis focussed upon examining whether participants’ knowledge, attitudes, and perceptions changed across their initial coursework and practicum experiences. Results are presented in Table 7 (knowledge), Table 8 (attitudes), and Table 9 (perceptions). To examine the magnitude of differences for any significant change, Cohen’s $d$ was calculated. The magnitude of difference was interpreted through 3 value ranges: small was greater than .20, medium was greater than .50, and large was greater than .80 and above. Given the number of comparisons being made between knowledge, attitudes, and perceptions, a Bonferroni correction procedure was used. Thus, an alpha of .05 divided by total number of questions within each domain. The alpha for knowledge was $p < .006$ (.05/9), for attitudes was $p < .005$ (.05/10), and for perceptions was $p < .004$ (.05/11). Based on the Bonferroni correction, four significant differences were found from time 1 to time 2.

Effect sizes. Looking through the lens of the traditional alpha level of $p < .05$, 4 questions showed a significant difference over time (Field, 2009). In the knowledge section, the question “ADHD is not a real diagnosis, but instead a social construct” had a medium effect size of $d = .43$ at $p = .031$, showing an increase in score between Time 1 ($M = 2.86, SD = 1.33$) and Time 2 ($M = 3.29, SD = 1.01$). In the attitudes section, the question “I believe ADHD is a valid exceptionality” had a medium effect size of $d = .44$ at $p = .025$, showing an increase in score between Time 1 ($M = 3.21, SD = 1.25$) and Time 2 ($M = 3.61, SD = .73$). Also in the attitudes section, the question “I feel I have enough knowledge about ADHD classroom interventions in order to manage ADHD-type behaviours” had a medium effect size of $d = .44$ at $p = .026$, showing a decrease in score.
between Time 1 \((M = 2.07, SD = .813)\) and Time 2 \((M = 1.54, SD = 1.03)\). Finally, in the perceptions section, question “Interventions made by classroom teachers are sufficient alone to deal with severe behavioural problems” had a medium effect size \(d = 0.46\) at \(p = .021\), showing an increase in score between Time 1 \((M = 2.57, SD = 1.50)\) and Time 2 \((M = 3.32, SD = 0.86)\).

Table 7

*Changes from Time 1 to Time 2 in Pre-Service Teachers’ Knowledge*

<table>
<thead>
<tr>
<th>Question</th>
<th>Time 1 M/SD</th>
<th>Time 2 M/SD</th>
<th>(t)</th>
<th>(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHD is not a real diagnosis, but instead a social construct</td>
<td>2.86 (1.33)</td>
<td>3.29 (1.01)</td>
<td>-2.27</td>
<td>.031*</td>
</tr>
<tr>
<td>Special diets (e.g., reduced sugar, no food colouring, wheat free, lactose free, additive free) are an effective treatment for ADHD</td>
<td>2.39 (1.59)</td>
<td>2.21 (1.52)</td>
<td>.56</td>
<td>.578</td>
</tr>
<tr>
<td>There are several subtypes of ADHD, which can present themselves in different behaviour manifestations.</td>
<td>2.61 (1.59)</td>
<td>2.61 (1.72)</td>
<td>.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Children with ADHD can choose to be better behaved.</td>
<td>2.81 (1.27)</td>
<td>2.93 (1.10)</td>
<td>-.366</td>
<td>.717</td>
</tr>
<tr>
<td>Children who have predominantly hyperactive-type of ADHD often talk excessively and also have difficulty staying in their seat.</td>
<td>2.96 (1.10)</td>
<td>2.75 (1.29)</td>
<td>.732</td>
<td>.470</td>
</tr>
<tr>
<td>Poor parenting and not enough discipline can cause ADHD.</td>
<td>3.43 (.99)</td>
<td>3.39 (1.41)</td>
<td>.166</td>
<td>.869</td>
</tr>
<tr>
<td>Children who present ADHD behaviours, regardless of ADHD diagnosis, can benefit from individualized behaviour management strategies.</td>
<td>3.00 (1.41)</td>
<td>3.36 (.98)</td>
<td>-1.62</td>
<td>.115</td>
</tr>
<tr>
<td>Some children can present ADHD-type behaviours, such as inattentiveness or hyperactivity, yet not meet the criteria for an ADHD diagnosis.</td>
<td>2.96 (1.47)</td>
<td>3.32 (1.09)</td>
<td>-1.06</td>
<td>.295</td>
</tr>
<tr>
<td>Children with ADHD often fail to give close attention to their work, leading to careless mistakes.</td>
<td>2.18 (1.24)</td>
<td>2.07 (1.38)</td>
<td>.406</td>
<td>.688</td>
</tr>
</tbody>
</table>

* Represents questions that showed a significant difference from time 1 to time 2
Table 8
Changes from Time 1 to Time 2 in Pre-Service Teachers’ Attitudes

<table>
<thead>
<tr>
<th>Question</th>
<th>Time 1 M/SD</th>
<th>Time 2 M/SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>I believe ADHD is a valid exceptionality.</td>
<td>3.21 (1.25)</td>
<td>3.61 (.73)</td>
<td>-2.37</td>
<td>.025*</td>
</tr>
<tr>
<td>Having a student with ADHD is a social benefit to the other students in my classroom.</td>
<td>1.70 (1.46)</td>
<td>2.22 (1.18)</td>
<td>-1.73</td>
<td>.095</td>
</tr>
<tr>
<td>Students who display ADHD-type behaviours cause me to experience stress.</td>
<td>2.32 (1.18)</td>
<td>2.46 (.79)</td>
<td>-.812</td>
<td>.424</td>
</tr>
<tr>
<td>Accommodations for students who exhibit behaviours associated with ADHD are easy to implement in a general education classroom.</td>
<td>2.30 (1.13)</td>
<td>2.41 (.88)</td>
<td>-.473</td>
<td>.640</td>
</tr>
<tr>
<td>Children who exhibit behaviours associated with ADHD misbehave because they do not want to follow classroom rules.</td>
<td>3.30 (1.06)</td>
<td>3.33 (0.92)</td>
<td>-.273</td>
<td>.787</td>
</tr>
<tr>
<td>I have received adequate professional training in my B.Ed. about managing ADHD-type behaviours.</td>
<td>1.68 (1.02)</td>
<td>1.61 (.99)</td>
<td>.338</td>
<td>.738</td>
</tr>
<tr>
<td>I feel I have enough knowledge about ADHD classroom interventions in order to manage ADHD-type behaviours.</td>
<td>2.07 (.813)</td>
<td>1.54 (1.03)</td>
<td>2.36</td>
<td>.026*</td>
</tr>
<tr>
<td>I need to consider changing my teaching style to support the individual needs of students with ADHD in the classroom.</td>
<td>2.64 (1.42)</td>
<td>2.14 (1.40)</td>
<td>1.45</td>
<td>.157</td>
</tr>
<tr>
<td>Supporting students with ADHD restricts me from supporting the other needs in my classroom.</td>
<td>2.96 (1.07)</td>
<td>2.64 (1.12)</td>
<td>1.56</td>
<td>.130</td>
</tr>
<tr>
<td>I feel I have enough knowledge about ADHD-type behaviours.</td>
<td>1.75 (1.04)</td>
<td>1.75 (1.07)</td>
<td>.000</td>
<td>1.00</td>
</tr>
</tbody>
</table>
### Table 9

*Changes from Time 1 to Time 2 in Pre-Service Teachers’ Perceptions*

<table>
<thead>
<tr>
<th>Question</th>
<th>Time 1 M/SD</th>
<th>Time 2 M/SD</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interventions made by classroom teachers are sufficient alone to deal with severe behavioural problems.</td>
<td>2.57 (1.50)</td>
<td>3.32 (.86)</td>
<td>-2.44</td>
<td>.021*</td>
</tr>
<tr>
<td>Peers are an effective learning support for students with ADHD.</td>
<td>2.57 (1.37)</td>
<td>2.54 (1.26)</td>
<td>.138</td>
<td>.892</td>
</tr>
<tr>
<td>Assessment does not need to be differentiated for students with ADHD.</td>
<td>2.86 (1.04)</td>
<td>2.96 (1.03)</td>
<td>-4.86</td>
<td>.631</td>
</tr>
<tr>
<td>All students with ADHD exhibit hyperactive behaviour.</td>
<td>3.11(1.10)</td>
<td>3.14 (1.17)</td>
<td>-.140</td>
<td>.889</td>
</tr>
<tr>
<td>Task engagement is not necessary for students with ADHD to succeed academically.</td>
<td>2.57 (1.42)</td>
<td>2.64 (1.63)</td>
<td>-.205</td>
<td>.839</td>
</tr>
<tr>
<td>The behaviours exhibited by students with ADHD restrict their development of successful friendships.</td>
<td>1.96 (.99)</td>
<td>1.89 (1.13)</td>
<td>.338</td>
<td>.738</td>
</tr>
<tr>
<td>Teachers can assist students with ADHD to ignore distractions in order to stay focused during class activities.</td>
<td>2.30 (1.13)</td>
<td>2.56 (1.05)</td>
<td>-1.27</td>
<td>.215</td>
</tr>
<tr>
<td>Students with ADHD need to be formally diagnosed before teachers can provide adaptations in the classroom.</td>
<td>3.39 (0.91)</td>
<td>3.36 (1.09)</td>
<td>.238</td>
<td>.813</td>
</tr>
<tr>
<td>Teachers need assistance from other professionals (E.g. educational assistant, doctor) in order to effectively support students with ADHD.</td>
<td>2.54 (1.10)</td>
<td>2.86 (1.26)</td>
<td>-1.47</td>
<td>.153</td>
</tr>
<tr>
<td>Hyperactive/Impulsive behaviours disappear over time.</td>
<td>1.25 (0.96)</td>
<td>1.11 (1.03)</td>
<td>.596</td>
<td>.556</td>
</tr>
<tr>
<td>Inattentive behaviours disappear over time.</td>
<td>1.21 (0.91)</td>
<td>1.07 (0.94)</td>
<td>.528</td>
<td>.602</td>
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Interview Results

Results of the individual interviews will be presented in three sections: knowledge, attitudes, and perceptions. The two vignettes will be discussed under the perception category.

Knowledge

Participants’ articulation of knowledge can be represented through two major themes: weaknesses of ADHD knowledge as an exceptionality, and absence and inconsistency of professional learning experiences. The results for each of these themes are presented in this order.

Weakness of ADHD knowledge as an exceptionality

The first major theme was created through eight different axial codes: assumed ADHD symptoms, lacking symptom knowledge, lack of confidence in ADHD symptoms, lack of classroom strategies, lack of knowledge to identify triggers, lacking accommodation knowledge, root cause of ADHD, and feeling unprepared. The following sections break down the themes and patterns that emerged in the data that were categorized under ADHD content knowledge.

Assumed ADHD symptoms

When using the vignettes as a protocol tool at the beginning of the interview, a discussion surrounding ADHD symptoms arose. The first vignette used presented Sarah, a primary/junior student showing ADHD-type behaviours. All three participants were asked to pick out symptoms that they felt were representative of ADHD-type behaviours, in order to gain better insight into participants’ ADHD content knowledge.

When attempting to identify ADHD symptoms for the vignette student (Sarah), the three participants showed various levels of confidence when answering. Two participants were more confident than the third. Linda and Kelsey stated that they found Sarah’s behaviour to be familiar and a good profile of a lot of the students they have seen on their practicums. Kelsey and Linda were able to recognize that Sarah struggled with organization issues; she day dreamed, had a hard time socializing, displayed an inability to self-regulate, blurted out, was easily distracted, and had
high energy levels. However, Linda lacked confidence in her symptom knowledge. Linda stated that it was possible there were ADHD symptoms there, but that these characteristics could “also be something else too”. Linda felt it was possible it was not ADHD, and possibly another exceptionality or something else in general. Linda stated, “It’s possible it’s not ADHD. She could just be disengaged?” Linda felt that she needed more information from a specialist or an external source. Kelsey on the other hand, was able to identify Sarah’s strengths as well as weaknesses, while further identifying the social and academic issues Sarah may experience. “Academically, I think she’s going to struggle with not being perceived to be at grade level with a lot of the skills, especially with math and language. Socially, just a lack of confidence.” (K) Kelsey chose to accept the opportunity to take a concentration in exceptional learners in her B.Ed program, which could contribute to her higher level of content knowledge than the other two participants who chose different concentrations. Doug was less successful in identifying ADHD symptoms and behaviours in Sarah. Doug was able to identify that Sarah paid attention to the wrong information, that she was unable to “control herself”, and was unable to focus. However, even as an experienced educator with his own classroom while teaching abroad, Doug was assuming that certain behaviours were symptoms. “I don’t know about that time duration, that could be another symptom?” (D pg 2) Doug admitted that he did not know enough about ADHD to be able to identify the symptoms within the vignette. “I wouldn’t know enough about ADHD to say whether or not anything else here is indicative of ADHD.” (D pg 2)

*Lack of symptom knowledge.* The lack of symptom knowledge from some participants extended further into the discussion of ADHD gender differences. Some participants were not aware that there were gender differences in the presentation and severity of some ADHD symptoms. All three participants had stated what ADHD symptoms they felt were present, if any, in regards to the vignette student Sarah. They were then asked if they thought the ADHD
symptoms that they felt were present, would be different if the student in the vignette were a male. Linda replied to this question “I don’t know, to be honest,” and further stated that she had not considered that there could be differences. When Kelsey was asked the same question, she also did not know and lacked confidence in her answer. “No? I don’t think so? I think those are common general indicators.” (K) Doug did not have as clear of an answer when being asked this question. He stated that there could be potential differences. Based on his experience, he felt that boys and girls have stereotyped and generalized differences of what they may enjoy doing in the classroom. “Based on my experience, I can think of some children who are either suspect to ADHD or diagnosed with ADHD in the classrooms I’ve been in, and their behaviour is a bit different I suppose.” (D)

**Root cause of ADHD.** The idea of what participants felt caused ADHD or the idea of it being a social construct came up differently in each interview. When Kelsey was asked about what she thought was the cause of ADHD, she answered that she felt children were predisposed to it and that whether or not its origin is internal or external to a child was irrelevant. “Whether or not it be internal or it’s the external classroom which are providing factors which are distracting them, I don’t think they’re doing anything maliciously… I just feel as though it contributes to their inability to complete it [work].” (K)

Doug was also confident that parenting practices and lack of discipline was not the root cause of ADHD. He felt strongly that the cause of ADHD was not parenting, but he could not give a factual definition as he admitted to not knowing enough about what the research says. “I would assume there’s a genetic hereditary component, because it’s not the environment provided directly by the parents. It could be something else in the environment.” (D) Doug was also asked about his definition of a social construct and whether or not his definition influenced his opinion of ADHD as an exceptionality.
I would say so. I would say that the understanding of ADHD through pop culture and social communication, even within teachers, is different than what it actually is. I don’t think people can answer objectively, they can’t provide a definition of what ADHD is. But people have this understanding that it exists out here in a separate place, that may relate to the actual definition, but doesn’t. (D)

Doug further felt that stereotypes and generalizations could be interwoven into society’s idea of ADHD. Linda, like the other two participants, could not give an answer. “I don’t know. I don’t know if anybody, does anybody have any idea of what causes ADHD? I’m not really sure.” Linda was them asked if she felt it was more social, more genetic, or more environmental in its origin. Linda replied she felt it was a mix of the three. “I wouldn’t want to point the blame solely at parenting, because I think there is probably a genetic factor, and probably an environmental factor. I don’t really know.” (L)

**Lack of classroom strategies and accommodation knowledge.** The use of classroom strategies arose when Doug was discussing his perception of the first vignette, featuring a female study (Sarah). Doug was asked how an educator could help this student in the classroom, using strategies or resources.

You know what, I don’t think that I’ve seen…but I wouldn’t know. I wouldn’t want to try anything that I wasn’t sure was a right fit for her because I don’t know enough about ADHD. In the classrooms I’ve been in, the children who have ADHD or suspect of that, the school often uses fidget toys, balls, separate seating, a whole bunch of tools. They have special folders where they get, you know, work to do on the side to keep them I guess focused…But, needless to say I don’t know enough about it. I would say that some of the strategies they use are good? But I would really have to do my research before I used a strategy. (D)
Doug explained that he had an experience on his teaching practicum where he was faced with a challenging student. Doug explained that he did not know if the student’s symptoms were ODD, or ADHD, but he chose to describe the student as having very jittery, disjointed thinking, and had a fidget toy and a bouncy ball for him to sit on. The student also experienced violent outbursts that Doug explained to be very unpredictable. “This may be more comorbid with ODD, but he would have violent outbursts, unpredictable, and then there was stuff that is clearly ODD, which was opposition to authority, manipulative, and those kind of things.” (D) Doug was asked if he felt that he had enough strategies to assist this student on his practicum, in which he replied “no, god no.” When asked to clarify he replied “definitely not”. Doug explained that he had no idea there could be such aggressive behaviour and that the behaviour was like that every day. This led the researcher to probe to discover whether or not Doug felt he had enough knowledge to indicate or prevent triggers to aggressive behaviour in students with exceptionalities. To this question, Doug also confidently replied “no.” Later in the interview, Doug was asked what he found challenging about implementing accommodations for students with ADHD; he replied, “I guess not knowing what they are.” With years of teaching experience, and coursework from the summer and fall terms in his B.Ed. program, Doug still felt as though he does not have enough knowledge of accommodations for students with ADHD.

Kelsey was equipped with a bit more knowledge of classroom strategies and accommodations for students with ADHD than the other two participants. Accommodations were brought up while Kelsey was discussing her first teaching practicum experience. Kelsey discussed how she had an idealized version of what her practicum experience would be like. “You could just go in and do this, this, and this, and that everything would be ‘easy peasy’”. Kelsey felt the reality of educators and stated that implementing accommodations “really is a work in progress and you need to try out a few things.” Kelsey faced frustrations during her
practicum, specifically when attempting to implement accommodations and modifications. Kelsey’s associate teacher had a different way of running a classroom and their viewpoints often clashed. “I think it has to do with the associate teacher that I was with. I just felt that it was a struggle to implement anything. I shouldn’t put it all back on my associate, but the disorganization and I felt like, things were implemented and not followed through…these accommodations just weren’t followed through in a way that I thought was productive.” (K) This assisted in Kelsey’s struggle of implementing the accommodations that she did know, through coursework and prior teaching experience. The researcher asked Kelsey if she felt that she was personally equipped with enough accommodation knowledge for students with ADHD. Kelsey replied that she could always use more knowledge and that implementing accommodations was difficult because “each child is a unique individual and what will work for one, will not work for the other so it’s trial and error.” Kelsey further stated, “As educators, we could all benefit from more knowledge and more tools.” Kelsey was asked to discuss what specific accommodations or modifications teachers could implement for students without an ADHD diagnosis, as Kelsey also has prior teaching experience abroad. She stated:

Well I think first of all, just empathy and understanding. Not just writing that child off as being a horrendous individual. Again, extra time, kind of taking the time and really observing that student and seeing what works. For the one student in my last practicum, they responded really well to countdowns. So if they weren’t doing something and needed to be redirected, the 5-4-3-2-1, would work really well to help redirect them. And, again, it was through trial and error that the strategy came out. Consistency; don’t just try one thing one day and it doesn’t work and so move on to something else. Keep routine and communication with other teachers, just seeing what happens. And yeah, just treating each child as an individual. (K)
Through Kelsey’s discussion, it was suggested that it was important to see the child as separate from their exceptional needs. Kelsey also had expressed how important it was to get to know the child first, before worrying about academic accommodations.

Linda’s knowledge of accommodations also surfaced during the discussion of her reaction to the vignette regarding the student Sarah. Linda took a different perspective to accommodations. Linda stated it is the educators’ role to consider the task you are asking the student to do, “Is it really worthwhile to ask the whole class to silent read for 20 minutes?” Linda questioned if there was a way that tasks could be restructured, such as in the form of a reading nook or somewhere where the students could have a bit more choice of when they’re doing things. Linda named accommodations such as chunking the student’s work so that the student is not overwhelmed. Giving the student graphic organizers and structures to help the student stay organized with their work and their desk was another suggestion. Linda felt it was important to also provide structure for the student. “Just give her some structure, so that she knows what’s expected and she knows where things go…and I think supporting her” (L). Linda’s approach to working with the student with exceptionalities was similar to Kelsey’s. It was important to Linda to really get to know the student and capitalizing on the child’s interests. Linda noted that the student in the vignette seemed to have some great qualities. “It says she’s compassionate, outgoing, and chatty. She’s got that, sort of bubbly personality and is willing to talk in class” (L). Linda questioned if there was a way that, as an teacher, he/she could capitalize on Sarah’s interest in play writing. Linda felt that writing plays is a valuable skill for school, so to find a way to include that when lesson planning would be beneficial to Sarah.

**Absence and inconsistency of professional learning experiences.** When all three participants discussed their knowledge of ADHD, or in some cases a lack of, they each related it to their experience in the Bachelor of Education program. Professional development was
represented through ten axial codes: educational experiences, inadequate professional training, academic concentrations, ineffective learning environment, ineffective presentation of information, lack of training, coursework knowledge, ineffective knowledge, lack of addressing exceptionalities, and student view negatively tainted.

**Educational experiences.** All three participants had a multitude of things to discuss when it came to their experience in their Bachelor of Education program and the ADHD knowledge they received from their program. A major theme throughout all interviews was the concept of coursework and the accessibility to learning about exceptionalities. More specifically, the knowledge gained on ADHD through the mandatory courses during the participants’ Bachelor of Education program. In their Bachelor of Education program, students have the opportunity to take a concentration in various topics. However, for those students who did not get accepted into a special education concentration or who chose a different concentration, the opportunity to learn about exceptional learners is limited. Kelsey had the opportunity to take the special education concentration. She explained her positive experience:

> We’ve been able to delve into not only the exceptionalities themselves, but also just implications within the classroom and creating real and tangible ways of, not dealing with the students, but accommodating those students. I was so blown away when we talked about PECS [Picture Exchange Communication Systems] and creating this reward system, and then to actually see it be implemented in the classroom on my last practicum, that was such a valuable tool. (K)

Kelsey also chose to take the tribes workshop to learn more about meeting the needs of various learners. Tribes is a course is for teachers to learn strategies step-by-step that will assist them in creating a positive classroom environment, while further learning strategies to help improve
student behaviour and learning. Kelsey did voice her concern about the concentrations and that they can be limiting.

I chose to take that [special education] class but I was also lucky enough to get into it. One of my best friends here, she’s equally passionate about it [special education] as I am, but she got put into a technology track. Which she loves! She’s gaining a lot of understanding and knowledge, but she’s just feels ‘I’m completely in the dark when it comes to exceptionalities’, and that’s one thing that, even just talking to my colleagues, there have been some questions about the necessities of some of the courses that we’re taking. Especially when people don’t find them the most effective. But I know exceptionalities is one that everyone wants more exposure to and everyone thinks should be a requirement. (K)

Like Kelsey, Linda voiced her opinion on the concentration aspect of the B.Ed. program. Linda chose to take the outdoor education concentration, but she also stated that she felt the same way about exceptionalities in that sense.

We don’t necessarily talk about exceptionalities in all the classes in as much detail. It’s fine if they’re [other teacher candidates] specializing in that, but it would be nice if we could see some of these themes weaving through [the courses], instead of boxing them into them [a special education concentration]”. She also felt that the term ‘specialist’ should be used loosely. “I know people who got like their 8th or 9th choice for [concentration] studies. So to say like ‘they’re specialists’ in that area, I mean maybe they’re not that engaged with the material? I don’t know. It’s interesting. (L)

Linda expressed her opinion that she thinks these topics, exceptionalities included, were so important and that they should be addressed in other details. “We don’t necessarily talk about exceptionalities in all the classes in as much detail. It’s fine if they’re specializing in that, but it
would just be nice if we could just see some of these themes weaving through.” (L) Linda felt there are many opportunities to ingrain the content into other courses. “Some of those things are just so important I think they need to be addressed in other areas. Like maybe not in such detail or depth, but still, there would be many opportunities to stick that into other course. For sure.” (L)

**Inadequate professional development.** All three participants discussed the lack of courses that dealt with ADHD content. Two out of three interview participants felt that the only course that had a central focus upon exceptionalities was ineffective in many ways. During his interview, Doug was asked if he felt that his coursework helped to prepare him to work with students with ADHD. In which he replied,

I don’t know, I can’t really think. We had one or two talks that I can remember…I don’t know if they were super effective to deal with this one particular student (on practicum)...I don’t feel like coursework prepared me at all because, even with a psychology background, I didn’t have any idea of what to expect from that student. (D)

Later on in the interview, Doug continued to discuss his opinion of the ineffective learning environment and lack of ADHD knowledge received from the summer courses.

The two big events, or the two big lessons or structures in which that we talked about exceptionalities were one class, with one of our professors, I’m not going to name the name, and one of the grad students here who had one talk on ADHD. I personally felt that both of those were ineffective demonstrating exceptionalities in the classroom. They were ineffective in the matter of presentation, the environment it was presented in, the media it was presented with…everything about those classes seemed ineffective. (D)

Doug was not the only participant to feel this way about the summer course on exceptional learners. This course was the one mandatory class that discussed ADHD. There was no course that focused solely on ADHD. As previously stated, Kelsey was able to join the concentration in
special education, where she gained more exposure than other students to knowledge of ADHD. However, when it came to the mandatory summer course on exceptionalities, she also had some negative feedback. “There were a lot of issues with that class. Especially that being the second class that we had. I know a lot of people have a very, very, negative view on that class and their dealings with the subject matter I think are a little bit tainted because of the way they were presented.” (K) The researcher asked if Kelsey could explain what she thought some of the issues were that her and her colleagues felt were present.

It was stereotypical, it was out of date, and the resources that we used were from the 80s. It was just…it was so ineffective, and I just know that that is a subject that people are very passionate about and are just really wanting to learn more about. I feel as though…how do I say this…just because I am taking the EDST and FOCI, I feel I have so much more exposure to it (ADHD). (K)

The researcher also asked Linda whether she felt that her coursework had helped her to work with students ADHD. Linda took a while to answer this question and then replied that she did not think it had been really explicitly mentioned in classes since the summer course when they covered exceptionalities in depth. However, she did feel that she had gained knowledge even though it was not explicitly mentioned. “Hearing myself talk through those scenarios I recognize things that I’m saying, like differentiation and scaffolding and stuff like that it coming from courses. So I think they’re helping? But maybe not explicitly…if that makes sense?” (L) Linda also mentioned that she thought having the class that taught exceptionalities in the summer was challenging because she had completely lost the content, she had forgotten about it. “Because they were done in two week periods. It’s very quick!” (L) Doug and Kelsey also shared Linda’s thoughts when it came to other courses not necessarily discussing ADHD. Doug stated that he would constantly bring up situational questions in class, or would try to dissect an experience he
had to gain the professors insight, to which most times the professor could not fully answer. “I feel like sometimes they’re not addressing it because not everyone has the experience with a child like that.” Kelsey concurred with this attitude towards the courses and professors’ roles in the classes they teach.

I think the training I have received, especially from focus course, have been phenomenal. However, that’s just one class and it would be nice even if in like, our curriculum classes, if we even just touched on it [exceptionalities] …because I feel like we don’t really…it’s something I’m so passionate about, and I don’t feel as though it should be restricted to just one course. It really should be integrated across all of them. It shouldn’t be just relevant to one specific course. It should be all of the professors, all of the teachers… whether they’re drawing on their own personal experiences or doing a bit of extra research. And it should be integrated across everything. (K)

**Attitudes**

Participants’ attitudes of and towards ADHD are represented through three major themes: Survival when Understanding and Managing ADHD behaviours, Creating Valuable Learning Experiences, and Insight into Necessary Changes to the B.Ed. Program. The results for each of these themes will be presented in this order.

**Survival when understanding and managing ADHD behaviours.** The first major theme that emerged was survival when understanding and managing ADHD behaviours, which was created through six different axial codes: attitudes towards ADHD behaviour, attitudes towards managing challenging behaviour, reaction to behaviour, attitude towards ADHD as a valid exceptionality, attitudes towards student with ADHD in the class, and attitudes towards student with ADHD as a social benefit to others.
Attitudes towards inclusion of student with ADHD. Participants discussed their attitudes towards having a student with ADHD in the classroom, touching on both the positives and negatives of this inclusion method. Kelsey had a fairly positive attitude towards including students with ADHD in the classroom. Kelsey stated that she felt it was extremely important for students to learn empathy, compassion, understanding, and acceptance. “The world is not comprised of similar, cookie cutter people…everyone is not the same.” (K) Kelsey continued by stating that she felt the classroom was a wonderful, safe space for children to learn the importance of accepting others strengths and weaknesses. “You just need to accept people for who they are, and so I think it’s important to have a very diverse classroom in that sense.” (K) Kelsey was asked if she felt that there were negatives to having students with ADHD in her classroom. Kelsey discussed how the issues teachers face prevented teachers from being able to properly support students with ADHD. “With the lack of EA support, the increase in class sizes, just the teacher not being able to provide the one-on-one assistance or small group assistance, that not even just students with ADHD, but students need.” (K) Kelsey voiced her opinion that the use of one-on-one assistance would be ideal, but how it was not realistic all of the time. Kelsey disclosed a conversation she had with her practicum teacher surrounding this issue.

My associate teacher said, ‘I could one-on-one with about six of these students, and that’s what they really need, but I can’t. So every day I pick one or two students to really focus on, and hopefully by the end of the week I’ve reached all of those students.’ And I think that’s so disheartening, because you want to be in 5 or 6 different places at once, providing all of that help, but you can’t. (K)

Kelsey further stated that without that one-on-one time, behavioural issues associated with ADHD end up being a disruption to the class and could take away the focus of the other students. Kelsey found this experience to be stressful. “That’s what stresses me out. Not being able to,
effectively create an environment for which they can all learn.” Kelsey discussed the pressure she felt to meet all these students’ needs, especially the students who need more attention, such as students with ADHD. “You kind of feel like you’re failing them.” (K)

Doug also felt that there were some social benefits to including students with ADHD in the general education classroom, such as applying strategies for a student with ADHD that could benefit all students in the classroom.

One of the tools, that you know I believe you’re supposed to use, is to make sure that agendas are set and whatnot, having not only that student do it, but provide an agenda for all students. This could help everyone in that respect. Teaching the students and giving them exposure to all different learning styles, I can see as only benefiting I suppose, if handled correctly. (D)

However, when it came to Doug’s personal opinion he was torn on whether or not including students with ADHD was an actual benefit to other students in the classroom.

I’m torn because I don’t know enough about classroom management to say that it [including students with ADHD] is truly a benefit, based on my previous experience. Because, I can anecdotally see, that the classroom I was in, was not as effective having that one student in the classroom. The days that one student wasn’t there, the rest of the class was doing marvellous. (D)

Doug further explained that taking a social constructivist point of view, you would say to incorporate all students together, but he was not sure this would be truly beneficial.

I would say right now, I don’t know enough about ADHD and social constructivism, but I know that removing the child from the classroom…would have made the class function much better. Based on the fact that when the kid wasn’t there, the classroom was much better. (D)
**Attitude towards managing challenging behaviour.** Sensing that Doug had more of a challenging experience with a student with ADHD on practicum than other interview participants, the researcher probed further into what about the ADHD type behaviours caused Doug to experience stress while teaching. A big point of stress for Doug was the unpredictability when it came to his student with ADHD on his practicum. Doug stated that the student was violent to others and threatened the safety of the classroom in regards to resources and physical property. When discussing the student with ADHD’s behaviour, Doug had a positive perspective towards the student. Doug firmly believed that the student’s behaviours were not his fault.

Personally, I always look, I always try and approach educating from a very dispositional standpoint. The kids come as they are. You have to do your best as an instructor to make sure your disposition is always refined and always getting better, and you’re thinking about your students from as many different directions as possible. (D)

Kelsey experienced stress in regards to working with students with ADHD, but had a bit of a different experience than Doug. Kelsey spoke to the daily frustrations that she would experience in her practicum school and how these frustrations can impact your interactions with your students.

It was incredibly stressful and overwhelming. There was a lot of, an immense amount of hostility and negativity. I can remember the amount of times we were talked to in the teachers’ room or felt welcomed…and just to feel like they hated having you there was so discouraging. (K)

Kelsey found her practicum experience to be incredibly stressful and overwhelming at times, which negatively impacted her relationships with her students with behavioural issues.

I found myself getting very short with students, because I was so overwhelmed. I was like ‘I have to do agendas, I have to do this, and this, and this… I have to plan for the next
day’ and there were behavioural issues in the class. We did have two students that were diagnosed with autism. But we also had 3 or 4 other students who it was just difficult to get them to co-operate and concentrate and … know, you find yourself being a little bit more short with them because they was no other EA support in the class either so. (K)

Kelsey further discussed one student in particular she fell short with and thought he may have ADHD. “The one student in particular, I think may have ADHD. Just because they had a very, very difficult time sitting, focusing, but even eye contact. Never any eye contact, always looking everyone else.” (K) Kelsey stated that when instructions were given, this student chose to just do whatever he wanted. When it came to managing these challenging behaviours, Kelsey stated that she would always welcome more strategies to help her assist the students. “I tried approaching the students different ways, doing different things with them. But I felt like I wasn’t able to fully follow through with a lot of them, because again, you’re trying to deal with twenty-one other students.” (K)

Linda stated that she was not told she had students with ADHD on her practicum, but that she felt there might have been one student with ADHD on her observation practicum. “We did have a child who was I think medicated for ADHD…I believe. It wasn’t formally told to me? But he was medicated with behaviour issues, social defiance…and opposition to another classmate.” (L) Linda was asked whether she felt that she had a positive or negative experience with that child, in which she replied both. “Positive and negative. I think it started off kind of positive … and then there was sometimes where I was trying to deal with some of the behaviours, and there was sometimes when I was working one-on-one which were really lovely. So I think it was sort of an up and down.” (L) The researcher continued by asking if Linda felt stressed working with that particular student and their challenging behaviours. Linda replied by stating that she did not feel more stressed than she did feeling stressed about practicum in general. “It was a very high
needs class. There were a lot of students that were ESL, and you know, different needs. And um...a challenging school for low SES and all of that, so. There were lots of confounding factors.” (L)

**Attitudes towards ADHD as a valid exceptionality.** The questionnaire asked participants whether they felt ADHD was a valid exceptionality instead of a social construct. The researcher chose to expand on the participants’ answers to uncover what they felt a social construct was and whether or not they felt their definition influenced their questionnaire answer. Doug gave a definition of what he felt to be a social construct. “It is an idea or a theory manifested through informal communication. So through friends...social construct, something that is manufactured out of communicating between peers, that is not documented or in the literature. It’s something that is palpable, and can be documented by the literature? But it more so exists in its own separate realm, through understanding.” (D) The research clarified if Doug felt a social construct to be more through the word of mouth. “Possibly, yeah.” The researcher then asked if Doug felt his definition of a social construct possibly influenced his opinion of ADHD as a valid exceptionality.

I would say so. I would say that the understanding of ADHD through pop culture and social communication, even within teachers, is different than what it actually is. I don’t think people can answer objectively, they can’t provide a definition of what ADHD is. But people have this understanding that it exists out here in a separate place, that may relate to the actual definition, but doesn’t. (D)

Following Doug’s definition, the researcher asked Doug if he felt that part of the social construct could include stereotypes and generalizations, in which Doug answered yes. Kelsey had strongly agreed when asked if she felt ADHD was a valid exceptionality, instead of a social construct. When asked to expand on her questionnaire answer, Kelsey stated: “I think it’s a valid...
exceptionality when it impacts your academic and social and personal life. And you hate to say, but usually in a negative way.” (K)

Linda spoke to a different question on the questionnaire of ADHD is not a real diagnosis, but instead a social construct, to which she first somewhat agreed and then switched to strongly disagree. To unpack this question, the researcher asked what Linda’s definition of a social construct was.

So I answered first somewhat agreed and then disagree? So I think that must’ve been before we had taken the course on exceptionalities. I do think ADHD is a diagnosable condition, but I think it’s maybe over-diagnosed … because I think we say often that kids have attention difficulties, but actually … they’re just bored and distracted in the classrooms … So I think that’s probably where I was coming at with that, and I think if I then severely disagreed, it was because I had taken that exceptionalities course and been like ‘ok yes, ADHD is a diagnosis’. But I just think it’s over diagnosed sometimes. (L)

All three participants had a different perspective, but all agreed that ADHD is a valid exceptionality.

Creating valuable learning experiences. The second major theme for attitudes is the creation of valuable learning experiences. Creating valuable learning experiences is associated with the participants’ views on what implementations can be made to make the B.Ed. experience a more valuable learning opportunity in relation to feeling more prepared to work with and be knowledgeable about students with ADHD. The two major axial codes that will be examined are ‘necessary program changes’ and ‘wish to learn’.

Necessary program changes. All three participants expressed their concerns about the courses available dealing with ADHD content. Linda discussed how she felt there was a large disconnect between the work the teacher candidates do in their courses and what they do on their
practicum. Linda expressed it as a “jolt to the system” going from one to the next, in terms of switching from strictly courses and then being sent out to teach on practicum. In regards to ADHD specifically, Linda reiterated how it was addressed in the summer portion of the program and then has not really been explicitly addressed since then. “I think it’s challenging in the summer [because] the summer courses, I’ve completely lost. I forget about them, because they were done in two-week periods for consecutive. It’s very quick” (L). She continued by stating that she felt ADHD could be explicitly mentioned and one way to do this would be a mandatory course on exceptionalities, which would include ADHD content. All three participants strongly agreed that a mandatory course on exceptionalities is necessary for teacher education development. It is important to note that a course strictly on ADHD would not be realistic, but the participants all agreed that a mandatory course on exceptionalities should include ADHD content. Kelsey stated why she felt a course would be beneficial.

Well, especially with primary/junior, I feel as though getting into the classroom, a lot of the time these students, I shouldn’t say a lot of the time, but some of the time the students haven’t been diagnosed yet. So you just don’t know whether or not this is just the student’s normal behaviour, or whether or not these are indicators of an exceptionality.

And you also don’t know how to effectively accommodate them. (K)

Kelsey continued to discuss how knowledge of ADHD and other exceptionalities was even more important for primary/junior teachers to have, because the responsibility to fully support these students with ADHD falls back onto the classroom teacher, due to a lack of funding for EAs, larger class sizes, and other resources. “In order for us to be able to handle that, we need to be given the tools and the resources, to not only be able to identify them ourselves, but also to help accommodate these students in the classroom.” (K) Doug also strongly felt that a mandatory course on exceptionalities, ADHD included in that, would be extremely beneficial. After Doug
had stated that he did not feel coursework had prepared him for practicum earlier on in the interview, he later admitted that having a very challenging student with ADHD and possible comorbidity of ODD on his placement, and this student had changed his perspective on having a mandatory course on exceptionalities. The theme of a mandatory course on exceptionalities will be discussed later in this section.

Wish to Learn. Kelsey had discussed how she felt the Bachelor of Education courses focussed too much on the theoretical aspect of the education content. “I understand we do need to have a good theoretical base, because we do need to know where all these ideas are coming from. But, I feel like there’s a better way of integrating them.” All three participants discussed the need for strategies and tools that they could apply in the classrooms, rather than just the theoretical aspect of what the exceptionality is. Kelsey specifically, wished to learn how to handle defiance, as well as how to manage ADHD behaviour effectively with strategies and routines in the classroom. Kelsey felt it was important to learn not only how to address difficult situations with students with ADHD and other exceptionalities, but doing so while also helping out the rest of her class was a concern for her. Kelsey also would like to see more videos or real life examples of how these exceptionalities come up in classes.

I just feel as though, again, it can’t be all theory based…I feel the most valuable reading I’ve had was some of peoples experiences and having group discussions about how we would handle situations and getting different perspectives on that kind allows you to think outside your own personal view. (K)

Doug wished that he had learned more about ADHD symptoms in his Bachelor of Education program. “Like it’s comorbid issues, or it’s comorbid symptoms, or like things to look for, in a student with ADHD.” Doug also stated that he was not sure if ADHD symptoms had been covered during his program. “How to be able to recognize those symptoms, and if it was
prevalent, and if it was demonstrated to us during the time that I was here, then…maybe I need to do a better job of listening when it was presented.” Doug said while laughing. Sarcasm came across while Doug answered this question. It appeared that he was trying to insinuate the program did not do a good job of demonstrating how symptoms could be presented during the presentations he attended in his B.Ed. program. Doug further discussed that he also would have like more situational examples. “With over a thousand hours of teaching before, having that experience in the classroom fundamentally changed the way I look at classroom management and teaching. So I think if that alone, in every class we talk about classrooms and start dissecting experiences. I bring that one up constantly, and I say ‘what if this happens,’ ‘this is an experience I had, what would you do then?’” The researcher clarified and asked Doug if he wished to have learned more strategies or intervention strategies, in which Doug replied:

Yeah! I think that with the time given in our [program], I think there was more than enough time in the summer to investigate, some of the rare, but prevalent diseases or illnesses or medical conditions, that could be at play. Whether it’s cystic fibrosis, whether it’s ADHD, whether it’s autism, anything that you would deem a student atypical of, which would pose an enormous challenge. Most people, I think, can get in front of a classroom of really good kids and be able to teach. And it takes a very specific kind of person, who has a lot of skill, to be able to handle a classroom that isn’t perfect, so. (D)

Linda’s discussion of what she would have liked to learn stemmed from her realization during practicum that maybe she did not know as much as she thought she did when it came to ADHD classroom interventions and strategies. Linda stated that in order to help her feel more prepared, the program could talk about exceptionalities, including ADHD, in more detail. “What do the symptoms actually look like in the classroom? Give me a case study to read of student behaviour, rather than…it’s all nice to see a jot note list of symptoms, but what does that actually look like in
the classroom?” (L) Linda also stated she would have liked some more accommodation knowledge for ADHD, about supports you can use and different strategies. As well, Linda would have liked to learn about some of the cross over. “We kind of studied them in isolation, but what do you do if you have a child with multiple exceptionalities? How do you, or how can you address that?” (L) This concern coincides with the other two participants yearn for more knowledge of co-morbid symptoms. Linda, like Kelsey, felt that case study work would be very valuable. Linda described that case studies would allow students to discuss what they would do as a group of teacher candidates, to see where they are similar or where they differ in how they would respond to the situation and what actions they would take. Linda also echoed Kelsey’s expressed need for classroom management strategies.

Okay, you’ve got this child who is shouting all of the time, we have these strategies that we have been given, like giving them one-on-one attention, doing all of these things, you know…graphic organizers for them, but that’s one child out of thirty. So…if you’re dealing with that child, how do you deal with the rest of the class? And if you’ve got more than one exceptional student, which is more than likely you will have, so a bit of that side of things too would be really helpful. (L)

**Insight into necessary program changes to the B.Ed. program.** The final major theme under the attitude category is Insight into Necessary Program Changes to the B.Ed. Program. This theme encompasses participants’ attitudes towards the future development of the extended B.Ed. program, which all participants felt should include a mandatory course on exceptionalities, which should also include ADHD content.

**Attitude towards mandatory exceptionality course.** During Kelsey’s interview, she was asked: “If you could wave a wand, and have something put in place or anything changed for your faculty of education to help the experiences of students with ADHD, what would you want to see
happen?” Kelsey answered fairly quickly “honestly…a course in exceptionalities.” In which the researcher clarified, “a mandatory course?” Kelsey stated: “A mandatory course, because the only introduction that a lot of people have had, with exceptionalities, is one of the courses here. I forget what it is.” The researcher asked Kelsey what she would want to learn in this mandatory course on exceptionalities. “Having more videos or having real life examples of how the exceptionalities come up in class. Or do more case studies. We could all benefit from more knowledge and more tools.” (K) Linda was asked the same question in regards to having a magic wand and if there were anything she would change or implement to help the experiences of students with ADHD. Linda agreed with Kelsey that there should be a mandatory course on exceptionalities. She also discussed what type of learning experiences she would like to have in that class.

I think the mandatory course on exceptionalities would be really valuable, and talking through more case studies. I feel like we didn’t really. I guess I kind of expected that we would do some more peer teaching before we went out on practicum? I think we did one after practicum in one curriculum course, but I think it would be really valuable to pretend to be the student and pretend to be the teacher, and let’s see how it goes? Let’s implement a lesson. I think that would be really valuable. (L)

Doug was asked if he felt a mandatory course on exceptionalities would be beneficial to all teacher candidates, with the mandatory course discussing ADHD content. “Yes, based on my experience. I wouldn’t have said that last year, but based on the experience I had, yeah…yes.” (D) Like Linda, Doug would have liked to learn the reality of students with exceptionalities.

When Doug was asked what he would want to learn in a mandatory exceptionalities course, Doug laughed and said:
What is to be expected? Like, as I said, I didn’t know about ODD. If we talked about ODD, it was a one PowerPoint slide saying ‘this is what it is’ and ‘this is when it occurs, its comorbid with ADHD’, and that was it. Nobody says like ‘this is what’s going to happen in the classroom’. (D)

Doug discussed his experience working with a challenging student on his practicum, his experiences with this student, and how he now thinks a mandatory course would be very beneficial.

I had such a hard time dealing with that classroom. I know I’m a strong teacher, because I have hours [of teaching experience]. But people who don’t, when they enter that classroom later on, let’s say they were assigned that [class] or an LTO, if it’s sink or swim…they will be sinking. I know I’m a strong teacher and I had a really, really, hard time with this boy. Other teachers who don’t have the hours behind them? There’s a very good chance that they’re not going to be able to cope. (D)

The researcher clarified, stating to Doug that even with his background and experience, if other teacher candidates did not have that and all they had was the coursework here, Doug interrupted the researcher and stated “Oh no, god no, there’s no chance! There’s no chance, none.”

Perceptions

The participants’ perceptions became evident when discussing the vignettes, which were used as a protocol tool in the individual interviews. In this section, vignette 1 will be explored first, followed by vignette 2. Two main themes under the perception category included: insight into vignette student Sarah, and comprehension of teacher/student relationship in vignette. How the participants perceive the students, as well as relationships, in the vignettes will be used to help explore the participants’ ADHD knowledge and attitudes towards ADHD behaviour, as well as their locus of control as future educators. The first vignette that will be explored focused on
participants ADHD knowledge and attitudes towards ADHD behaviour, with the second vignette focusing on the participants’ locus of control. The first vignette features a female student (Sarah) that shows ADHD symptoms, but does not have a diagnosis. The second vignette includes a male teacher (Mark) and male student (Darren) relationship, where ADHD symptoms are present but also no diagnosis.

**Insight into vignette student sarah.** All participants described their first reaction towards Sarah’s behaviour in the vignette. Linda and Kelsey both seemed to easily recognize this student’s profile. Kelsey stated, “I feel as though she is a good profile of a lot of the students that we see, that I have seen during my practicum.” While Linda concurred, “I feel like she’s very familiar. I think I’ve seen lots of kids with that type of … maybe not the same details, but with that type of experience in schools.” Doug’s first reaction was to discuss the student’s weaknesses, “She lacks strength in math and language.” The researcher probed to see if there was anything else Doug wanted to touch on in regards to the student’s behaviour. “She sounds like she’s very social. She has friends at school, though. It says here she’s chatty. But it also says she does not have a lot of friends and tends to isolate herself as recess.” Doug discussed how he felt differently about the first half of the passage than the second half and he seemed unsure how to react to the student’s behaviour. Kelsey went straight to the positives of the vignette student, stating that the student was strong in mathematics. Both Kelsey and Linda also stated that the student seemed to have social issues. Linda made the point of stating that there was not a diagnosis listed in the vignette so she could not really make any assumptions about the student’s behaviour, I can tell that she is not really up for trying new things. Maybe struggles with a bit of the kind of sit still, like when you talk about silent reading, it says she puts the book away for 5 min, and she doesn’t like to try new things. It sounds like she’s a bit socially isolated as well. Which maybe is, some of the issue? (L)
Kelsey discussed the strength of the student when it came to mathematics and how she recognized the social aspects of this student in relation to a practicum experience. “However, there is a certain level of anxiety in the classroom. And I saw it a lot too, when the students were very attached to the teacher or an adult figure in the classroom, however, [they] had a hard time socializing with their peers.” (K)

**Comprehension of teacher/student relationship in vignette.** This theme explores participants’ perception of the teacher-student relationship between Mark and Darren in the second vignette. Linda did not find the relationship to be very good. “I think it’s exasperated. The teacher feels like he’s put a lot of effort in and the child hasn’t stepped into the role that he expected, so he’s saying it’s his own fault if he doesn’t succeed in school and the teacher kind of reassigned responsibility back onto the student. So I don’t think it’s a very good relationship at all.” (L) Kelsey found this relationship to be more positive than negative. Kelsey felt that as a teacher, Mark cared about Darren, and that Mark had taken the time to observe Darren and see some of his weaknesses. “Mark seems to have a fairly good understanding of those weaknesses, because it says right here ‘Mark does what he can to motivate Darren’, like extending time for his assignments and giving him an agenda. It seems as though initially, that Darren has been kind of ignoring all of the help that’s been provided for him. I think that Mark does have a genuine interest in Darren’s well being.” (K) Doug seemed to have mixed views when asked to express how he perceived the teacher-student relationship.

This is told from the third person, it says that Mark likes Darren, but it doesn’t say how Darren feels about the teacher. It seems that Mark’s put in a fairly good effort in trying to set Darren up for success in terms of the tools. It says he’s put him up with, an agenda, and extended time for assignments. Which you know, are two strategies you could use. But in terms of the relationship between the two? It’s unclear based on this passage, if the
relationship is good. Mark can get frustrated; Mark doesn’t think Darren cares about the consequences. Mark feels like he’s done everything that he can. (D)

All participants were asked to describe how they felt the teacher perceived Darren’s behaviour or attitude, and whether they would react the same or differently towards Darren if he were in their class. Linda felt Darren’s behaviour to be a bit oppositional. “He’s trying to do all these things to give him extended time and give him an agenda, but the student is refusing. So he’s seeing it as a rejection of his authority or a rejection of his help. Frustrated I think, by it.” (L)

Kelsey felt that the teacher was at first receptive to Darren, but then the situation turned more negative.

I think at first, he was just like ‘oh this is a student that I need to help. I’m going to be giving him these tools to help him.’ But, I think that by the end, it has turned resentful and negative. So I guess, whether it’s a positive or negative relationship, I think it started off positive. And then it has become negative, because Mark feels as though he has done all that he can. And, you know, frustrated just like throwing up your hands and being like ‘this is no longer my issue’. (K)

Doug felt that Mark perceived Darren to be a challenge in the classroom. “Probably negative, but veiled in ‘I’ve done everything I can’.” Doug also said that he could imagine that Mark might also be feeling frustration, anger, and disappointment. “I’d say at the end, hopelessness? He’s saying ‘okay well I’ve done everything, its Darren’s choice now’. You’re giving up on your student, so yeah. Hopelessness. He’s without hope for Darren.” (D pg 4) When Doug was asked whether he would feel or think similar things as this teacher, or whether he would react differently, Doug stated that he thought all teachers felt these emotions.

If you said that you weren’t frustrated and you weren’t hopeless, I think you’re lying. I think every teacher who has a student like this, who is a challenge, feels what this teacher
is feeling now. But you know, being...moving into becoming an exceptional educator, you have to be able to address how you feel about the student, but also see a much larger perspective, a much larger picture. You know, what are we, what issues are going on in Darren’s life both internally and externally, what’s his family life like? What’s you know, cognitively, what is he dealing with? Does he have an LD [learning disability]? What’s his history with other teachers? What’s his history with male teachers? What’s his history with administration? There are so many other things that come to play here. (D)

Doug chose to perceive this situation as an internal perspective, thinking there were always things you could do to help the student. Kelsey also agreed that she would feel frustrated with Darren, and that there are highs and lows with teacher-student relationships.

As a teacher, you want your students to succeed. I think it’s just kind of normal to be frustrated when you have a student that you care about, when you know that they’re not doing all that they can. But at the same time, it doesn’t mean you can give up on them.

You have to continue forward. (K)

Kelsey also had an internal locus of control, feeling that there was more that you could do as a teacher. “If these [approaches] aren’t working, then try something else. What’s the point of giving up? You never know. Something that you do could cause a breakthrough! Or just providing them with the support that they maybe don’t have elsewhere. That’s your job. That’s why you’re there.” (K)

Linda agreed with the other two participants, stating that Mark was frustrated with Darren. When asked if she would react differently or similar to having Darren in the classroom, Linda explained that she would try some of the things that Mark had tried, such as use of an agenda and extended time. However, Linda said she would aim to learn more about the student. “There’s not much information about the student’s interest, or his home life, or are his parents supportive? So I think I might try those avenues? To get a bit more support, rather than just
putting it all on me to say I’m going to do this, this, and this. What else is there available for us? Before just kind of writing him off?” (L) Linda took an internal locus of control perspective, which could be seen through her idea to get other members in the school involved to help support Darren, instead of leaving Darren to figure it out on his own. “I wonder if there’s a way that we can use the other students to help support him in a way that doesn’t impede their own learning, but actually helps their own learning? Is there a way we could get the parents involved? Is there an EA or another support in the school that we can access? I feel like he needs a bit more support.” (L)

**Interview vignette summary.** Two vignettes were used during the individual interviews. The first vignette focused on participants’ ADHD knowledge and attitudes towards ADHD behaviour, with the second vignette focusing on the participants’ locus of control. Findings suggest that all three participants had adequate ADHD symptom knowledge. However, some lacked confidence when it came to deciding if those symptoms were ADHD-type behaviours only, or if they were possible indicators of another exceptionality. When discussing with the participants whether or not symptoms vary by gender, only one participant felt that Sarah’s behaviour might have been different if she were a male. This suggests that participants may need some further development in terms of symptom knowledge.

When discussing the participants’ locus of control through the second vignette, all three participants expressed an internal locus of control. All three participants felt that there was something more they could do as an educator to help Darren succeed. Linda thought that getting other school members involved, such as peers and parents, to help Darren get back on track. Doug understood Mark’s frustration (the teacher in the vignette), but also stated that you cannot just give up on your student.
CHAPTER 5
DISCUSSION

The purpose of the study was to examine pre-service teachers’ knowledge, attitudes, and perceptions of including students with ADHD in the general education classroom. The original research questions for this study were designed to examine whether or not coursework and/or practicum experience influenced pre-service teachers’ knowledge, attitudes, and perceptions of including students with ADHD in the general education. As well, this study originally attempted to discover what underlies change in pre-service teachers’ knowledge, attitudes, and perceptions of including students with ADHD in the general education classroom. However, the way the nature of this study progressed and with a small data pool, the original research questions could not be answered independently. Instead, a more holistic approach was taken, using the two original research questions as guiding questions instead of specific questions to be answered.

This chapter discusses the themes related to pre-service teachers’ knowledge, attitudes, and perceptions, and will be discussed in terms of their relation to the conceptual framework of teachers content knowledge and locus of control. Following this discussion, the limitations of this study are considered. Finally, the implications of this study on future teacher education programs, and special education research are discussed.

Teachers’ Content Knowledge

Content Knowledge, as described by Shulman (1986, p. 9), refers to “the amount and organization of knowledge per se in the mind of the teacher.” Shulman (1986) argued that although paying attention to the elements of the teaching process is important, educators should make sure to give proper attention to the content of the subject matter used for the purpose of teaching. Shulman further argued that it is impossible to be a good teacher unless teachers choose to examine content knowledge. This is important because a teacher’s individual content
knowledge often becomes transformed into the classroom instructional content. This study used the construct of teachers’ content knowledge to examine pre-service teachers’ perceived ADHD knowledge, as well as to provide insight into the ADHD knowledge that the participants feel that they have gained through their program and/or practicum experience.

Results from this study, both questionnaire and interview, suggested that pre-service teachers’ had ADHD knowledge, but that there were still gaps in their knowledge that needed to be addressed. Interview data suggested that some participants are able to recognize typical ADHD-type behaviours, but lacked confidence when attempting to disclose whether these behaviours were strictly characteristic of an ADHD child. Kelsey and Linda both stated that they felt vignette student Sarah was familiar and showed a good profile of students that they have worked with. Kelsey and Linda were both able to pinpoint ADHD-type behaviours shown by Sarah, but Linda was less confident and stated that she would need more information from a specialist before she could adequately identify whether the behaviours she was witnessing were characteristic of ADHD. Doug was less successful in identifying what behaviours were prevalent of a child with ADHD. Doug openly admitted that he did not know enough about ADHD to say whether or not other information in the vignette was indicative of ADHD. This was even more concerning, as Doug was an experienced educator with teaching experience abroad in his own classroom.

Participants also lacked knowledge when discussing subtypes of ADHD, and whether or not there were gender differences in the presentation and severity of some ADHD symptoms. At time 1, 21% of participants were unsure if there are subtypes of ADHD, with 7% strongly disagreeing that there are subtypes. At time 2, the percentage of participants unsure if there were subtypes of ADHD increased to 25%, with 7% still strongly disagreeing that there were ADHD subtypes. Further exposure to knowledge about ADHD subtypes as participants moved from time
1 to time 2, that is, more time spent in course work and practicum experiences did not appear to increase participants’ confidence to identify ADHD subtypes. Although there was only a 3% difference in the amount of participants agreeing, 25% of pre-service teachers continued to not know there were subtypes of ADHD and their diverse presentations. Although teachers were not qualified to diagnose exceptionalities in their students, it was imperative for teachers to be knowledgeable about the symptoms of ADHD so that they knew what characteristics to look for (Scuitto, Terjesen, & Frank, 2000). Knowing that there were ADHD subtypes and what types of behaviours were reflected in these subtypes was crucial to allow the participants to know how to adapt the curriculum, their classroom management skills, and assist them in setting realistic expectations for their students with ADHD (Holtz & Lessing, 2002).

Interviews also brought to light the lack of knowledge participants had in regards to gender differences in the presentation and severity of some ADHD symptoms. Kelsey and Linda did not think that there were gender differences in the presentation and severity of some ADHD symptoms. Kelsey answered confidently, no, she did not think there were differences between males and females when discussing ADHD symptoms. Linda stated she was unsure and looked to the researcher to provide an answer to whether or not there were symptom differences. Doug also did not have a clear, confident answer. Doug felt that there could be potential differences; he felt that boys and girls had stereotyped and generalized differences of what they may enjoy doing in the classroom. With pressure falling onto the general education classroom teacher to effectively implement classroom behavioural management strategies, it may benefit general education teachers to be knowledgeable about ADHD, including typical characteristics, symptoms, and differences between genders.

Some individuals, including educators, opposed the idea of ADHD as a medical condition, and instead, viewed ADHD as a reframing of daily childhood misbehaviour as a
sociocultural issue rather than a medical one (Danforth & Navarro, 2001). As the rate of diagnoses of ADHD has steadily increased (by 41% in the past decade) and public awareness of this named exceptionality grows, the knowledge surrounding the root of ADHD and what it actually is becomes more important (Danforth & Navarro, 2001; Schwarz & Cohen, 2013). At time 1, only 64% of participants agreed that ADHD was a real diagnosis and not a social construct, with 24% agreeing that ADHD was not a real diagnosis and instead a social construct. At time 2, the percentage of participants agreeing that ADHD was a real diagnosis increased to 86%. However, 10% still felt ADHD was a social construct and not a real diagnosis, with 4% now unsure how they felt. The knowledge teachers had about ADHD may also have influenced how they communicated with and taught children diagnosed with ADHD (Perold, Louw, & Kleynhans, 2010). As well, “having a better understanding may prevent them from developing negative views of these learners or labeling them” (Holtz & Lessing, 2002).

Results of this study suggested that the root cause of ADHD was still unclear for some pre-service teachers and that there were still possible misconceptions about the aetiology of ADHD. All three-interview participants disagreed that poor parenting and not enough discipline caused ADHD on their questionnaire responses. However, when the participants were asked to expand on their questionnaire response and discuss what they thought the cause of ADHD was, all three participants had a different answer. Linda had no explanation to what causes ADHD and was unclear if anyone knew the root cause. Kelsey felt that students with ADHD were predisposed to it, while Doug also was unsure of the cause. Doug, however, felt strongly that it was not parenting. When asked to expand, Doug could not give a definition as he admitted to not knowing enough about what the research indicates. A possible explanation for Kelsey’s higher level of knowledge surrounding the root cause of ADHD could be a result of her choice to take the special education concentration in her B.Ed. program. That concentration was the only other
course in the B.Ed. program in which to learn about ADHD and other exceptional students, and it was not available to all pre-service teachers. The other two participants only had one summer course on exceptional learner content to contribute to their ADHD knowledge.

Questionnaire findings supported the interview results that suggested pre-service teachers still had misconceptions about the aetiology of ADHD. From time 1 to time 2, there was an increase in the number of participants who agreed that poor parenting and not enough discipline can cause ADHD, from 14% at time 1 to 18% at time 2. There was also an increase from time 1 to time 2 in the number of pre-service teachers who thought that special diets were an effective treatment for ADHD, increasing from 21% at time 1 to 32% at time 2. Lastly, when pre-service teachers were asked if students with ADHD could choose to be better behaved, 11% agreed and 7% were unsure at time 1. At time 2, 11% were unsure and 14% agreed that children with ADHD could choose to be better behaved. This evidence suggested that some pre-service teachers might not fully understand that ADHD had a proven genetic component (Faraone & Biederman, 1998) and that there may still be a misconception surrounding the causes and treatment methods (Alkahtani, 2013). These findings were in line with current research, which suggested that in-service teachers hold misconceptions about ADHD (Jerome, Gordon, & Hustler, 1994).

Due to a decrease in knowledge on the four questions stated above from time 1 to time 2, an alternative explanation was that the pre-service teachers’ experiences on practicum and/or coursework may have been reinforced by the stereotypes that surround ADHD. This explanation emerged from Kelsey and Linda’s discussion of the vignette student Sarah’s profile, and how they found the student’s behaviour to be familiar and a good profile of a lot of the students they had seen on their practicums. If pre-service teachers come into contact with mostly hyperactive/impulsive subtype of ADHD, then the participants may be witnessing only the most obvious stereotypical ADHD behaviour, such as not being able to sit still, outbursts, and
impulsivity. Without proper knowledge of ADHD, the participants may continue to have misconceptions of ADHD and assume that the hyperactive child can choose to sit still, or for example, that removing sugar from the child’s diet would help to suppress the present hyperactive behaviours. However, there was no empirical evidence to support a relationship between sugar intake and increased hyperactive/inattentive behaviour in students with ADHD (Wender & Solanto, 1991). Any evidence of a relationship was completely anecdotal and not scientifically supported (Wender & Solanto, 1991). As well, social and environmental factors could be discounted in regards to the cause of the primary features ADHD, and research suggests that ADHD had a neurological origin (Schwean, Parkinson, Francis, & Lee, 1985). It could be concluded that students who had ADHD do not have the same degree of control over certain actions as their peers of the same age without ADHD (Schwean et al., 1985). If these pre-service teachers were witnessing only stereotypical ADHD-type behaviour, then their experiences may reinforce the stereotypes instead of challenging their pre-conceived notions. The results of this study that showed 25% of participants were unsure if there were several subtypes of ADHD, with 7% strongly disagreeing that they were several subtypes. This lack of knowledge may put higher pressure on the B.Ed. program to make sure myths are debunked, instead of reinforcing ADHD stereotypes.

To further assess participants’ content knowledge, the use of classroom strategies and accommodations were discussed throughout the interviews. During Doug’s interview he discussed working with a very challenging and aggressive student that he thought had ODD (Oppositional Defiance Disorder) as well as characteristics that were indicative of ADHD. Doug expressed that he did not have enough strategies or knowledge of accommodations to assist this student in the classroom. Doug also discussed that he did not have enough knowledge to indicate or prevent triggers to aggressive behaviour in students with exceptionalities. Kelsey had more
accommodation and modification knowledge than the other two participants, but stated that she could always use more knowledge and that implementing accommodations was difficult because “each child is a unique individual and what will work for one, will not work for the other so it’s trial and error.” These interview findings are supported through the questionnaire data. From time 1 to time 2, there was an increase in the percentage of participants that disagreed that accommodations for student who exhibit behaviours associated with ADHD are easy to implement in the general education classroom. At time 2, 43% of pre-service teachers still disagreed that accommodations were easy to implement. Pre-service teachers may have found accommodations hard to implement because they may not have had adequate accommodation knowledge. Doug was asked what he found challenging about implementing accommodations for students with ADHD, to which he replied, “I guess not knowing what they are.” This lack of accommodation knowledge held by some participants puts higher pressure on the B.Ed. programs to make sure that accommodations, modifications, and behavioural management strategies are effectively incorporated into the teacher education program content.

A major insight throughout each interview was the focus upon coursework and the inaccessibility to learning about exceptionalities, ADHD specifically, in their B.Ed. program. Although a more than adequate amount of knowledge of ADHD was not prevalent, the message that pre-service teachers want to know more about ADHD was evident in the individual interviews. Linda voiced her concerns about the lack of integration of exceptionalities into other concentrations. Unless participants chose or were placed into the special education concentration, they only received one course that discussed ADHD. All three participants described the small exposure that participants did have as ineffective. Participants stated that the course resources were outdated, the facts presented were incorrect, and that the media, environment, and presentation style were ineffective. Linda discussed forgetting the content because it was only
discussed in the summer term, and not well integrated into other course content. Doug stated that he felt coursework did not prepare him at all to work with students with challenging behaviours, while Kelsey discussed the necessity of primary/junior teachers having adequate knowledge. Kelsey discussed how knowledge of ADHD and other exceptionalities is even more important for primary/junior teachers, because the responsibility to support these students with ADHD fully falls onto the classroom teacher, particularly due to a lack of funding for educational assistants, larger class sizes, and fewer other resources.

This insight of being inadequately prepared by the B.Ed. program is supported through the questionnaire data. At time 1, 60% of participants disagreed that they had received adequate professional training in their B.Ed. about managing ADHD-type behaviours. This percentage increased at time 2, with 71% of participants disagreeing that they had received adequate professional training, and 14% of participants unsure. When asked if participants felt they had enough knowledge about ADHD-type behaviours, at time 1 64% disagreed that they had enough knowledge, with 14% unsure. At time 2, 60% disagreed that they had enough knowledge about ADHD-type behaviours, while 25% agreed and 14% were still unsure. After months of coursework and having completed a teaching placement, there was only a 4% decrease from time 1 to time 2 in students who felt that they do not have enough knowledge about managing ADHD-type behaviours.

**Locus of Control**

This study used the lens of locus of control to examine pre-service teachers attitudes of and perceptions towards including students with ADHD in general education classrooms. This section will focus upon pre-service teachers attitudes towards ADHD and perceptions of including students with ADHD in the general education classroom, as seen through the lens of locus of control.
Locus of control, whether internal or external, influences how pre-service teachers perceived students with ADHD and their role as a teacher in their classroom. Questionnaire data suggested that a majority of pre-service teachers believed that ADHD was a valid exceptionality. At time 1, 82% of participants felt that ADHD was a valid exceptionality, with this percentage increasing to 93% at time 2. All three-interview participants also viewed ADHD as a valid exceptionality; they expressed both the positives and negatives that the participants felt about including students with ADHD. Kelsey described that a positive of including students with ADHD in the general education classroom is that it taught other students to learn empathy, compassion, understanding, and acceptance. Doug also felt that the inclusion of students with ADHD could be beneficial because it allowed teachers to implement strategies that were beneficial to the other students in the classroom as well. However, Doug expressed an external locus of control when discussing his perception of the challenging reality of inclusion for his classroom practice. Doug appreciated the benefit of inclusion, but once the challenging behaviour of a student with ADHD was removed from his classroom, he felt the classroom environment became more positive. The external locus of control perception that having students with ADHD can be a challenge for both teachers and peers in the classroom was supported through the questionnaire data, which suggests that at time 2, 29% of pre-service teachers agreed with the statement that ‘supporting students with ADHD restricts me from supporting the other needs in the classroom’.

Kelsey also expressed an external locus of control when discussing her perception of the negatives of including students with ADHD. Kelsey discussed the external issues that had an external influence on teachers’ practice that teachers felt prevented them from being able to properly support students with ADHD. Kelsey explored topics such as lack of educational assistance support, an increase in class sizes, and not being able to provide the one-on-one
support that students with ADHD specifically needed, which suggested a duality of thinking. Meaning, Kelsey was able to think with an internal and external locus of control. Interview data suggested that participants had an internal locus of control when discussing the importance of inclusion, but when it came to the execution of inclusion in their classrooms, a more external locus of control appeared; inclusion was perceived as more of a challenge than a benefit. These findings are in line with several studies, which suggested that teachers were positive towards the general philosophy of inclusive education (Abbott, 2006; Avramidis, Bayliss, & Burden, 2000; Avramidis and Norwich, 2002; Marshall, Ralph, and Palmer, 2002), but that teachers had serious reservations about inclusive education in practice (Florian, 1998; Pearman, Huang, & Mellblom, 1997; Ring, 2005). In regards to teachers’ attitudes of inclusive education, teachers tended to endorse inclusive education in general, but did not like to become involved in the discussion of inclusion when it concerned their own teaching practice and varied their opinions on inclusion according to the type of disability (De Boer, Pill, & Minnaert, 2011).

When discussing how the three interview participants managed challenging behaviours in the classroom, all three participants had different approaches. All three participants experienced stress while on their teaching practicums and related that stress to external factors. A majority of the pre-service teachers also experienced stress when working with challenging students. At time 2, 57% of pre-service teachers felt that students who displayed ADHD-type behaviours caused them to experience stress. Doug stated that it was the unpredictability of the challenging student that caused him to experience stress. However, when attempting to manage the challenging behaviours, Doug expressed an internal locus of control. Doug understood that children come as they are, but expressed an internal locus of control when discussing how he perceived the teacher’s role when working with students who have challenging behaviours. Doug appreciated that as a teacher, he had to try to just do his best and constantly strive towards being the best
teacher he could be. Doug felt that teachers needed to think about the students from as many
different directions as possible. Linda held an external locus of control when discussing external
factors, such as the class being full of high needs and the location of the school being in a low
socio-economic status neighbourhood, which influenced her experience on her teaching
practicum. Kelsey held an external locus of control perspective when discussing the stress she
experienced on her teaching practicum. Kelsey spoke to the daily frustrations that she would
experience at her practicum school (e.g. not being included by fellow teachers, stress from
professional expectations) and how she perceived these frustrations to negatively impact her
interactions with her students. When it came to attempting to manage the challenging behaviours,
Kelsey placed blame on external factors (e.g. large class size) as reasons for not being able to
fully follow through with the strategies, routines, accommodations she was trying to implement
to deflate the challenging behaviours. Kelsey further discussed the external and internal pressure
that she felt to meet all of the different needs in the classroom. Kelsey described the emotion of
defeat and felt like she was failing her students, because she could not execute her role as a
teacher the way she wanted to due to external factors. The general sense of the data suggests that
the interview participants’ knew what the role of the teacher was and how it should be executed.
However, pressures of daily practice and external factors prevent pre-service teachers from
adequately supporting the students with ADHD they way they felt that they should. Instead, pre-
service teachers resorted to more of a survival mode, where pre-service teachers do what is
necessary to get through the day.

A difficulty that has faced Canadian teacher education programs for some time has been
the issue of theory and research taking prevalence over practice (Sheehan & Fullan, 1995). The
current study suggests that this lack of practice and overload on theory was still an issue in this
specific B.Ed. program, especially when discussing exceptionalities. At time 2, 61% of pre-
service teachers felt that they did not have enough knowledge about ADHD classroom interventions in order to manage ADHD-type behaviour, and 72% felt that they did not receive adequate professional training in regards to managing ADHD-type behaviours. Questionnaire and interview results focused on the implementation of knowledge that was supposed to be taught through teacher education programs.

Linda discussed how she felt the B.Ed. courses focussed too much on the theoretical aspect of educational content. She stated that she understood learning the theoretical aspect was necessary; however, she also described it as a jolt to the system having to go from a teaching practicum to coursework, and she did not feel like it was a smooth transition between the two contexts. All three participants discussed the need for strategies and tools that they could apply in the classrooms, rather than just the theoretical aspect of what the exceptionality is through dot jot notes. Participants also described the desire to know about the exceptionalities in more detail. Participants wanted to know what the symptoms actually looked like in the classroom, and felt that if a professor could not explain, then a case study should be provided that students could unpack together. This finding was in line with current research, which suggested that one of the best forms of preparation for teacher educators was reflective practice, which was best seen through conducting action research and using in-depth case study discussion (Whitney, Golez, Nagel, & Nieto, 2012). Teachers needed to be able to examine and discuss their authentic experiences and reflect on situations through case study analysis (Whitney et al., 2012). By having an opportunity to reflect on more realistic situations and gain greater content knowledge through practice, this would lead pre-service teachers to believe they have more control over external factors in the classroom, leading to an internal locus of control. Without adequate knowledge and having a safe space to address the concerns that pre-service teachers have about the classroom and exceptional learners, pre-service teachers may develop an external locus of
control because pre-service teachers may not feel confident enough to handle challenging situations or students due to a lack of knowledge.

Results from this study suggest that there may still be an issue with the design of teacher education programs. Studies have shown that “many teacher education programs have been criticized for being overly theoretical, having little connection to practice, offering fragmented and incoherent courses, and lacking in a clear, shared conception of teaching among faculty” (Darling-Hammond, Hammerness, Grossman, Rust, & Shulman, 2005). With the new extended program in Ontario, it would be more valuable of a learning experience if a large disconnect was not perceived between teacher education programs and classroom teaching experience. Studies have provided empirical evidence that suggests all teacher education programs who offer “coherent visions of teaching and learning, and that integrate related strategies across courses and field placements, have a greater impact on the initial conceptions and practices of prospective teachers, than those that remain a collection of relatively disconnected courses” (Darling-Hammond et al., 2005). It may be beneficial for teacher education programs to include real life examples of challenges in the classroom, while providing pre-service teachers with research proven tactics to address the challenges and giving them ample opportunities to discuss possible solutions. By doing so, pre-service teachers will feel more confident when heading into the classroom, knowing that they have discussed challenging situations and have the skills necessary to create solutions. This level of confidence will assist in pre-service teachers developing an internal locus of control.

This need to close the gap between teacher education programs and classroom practice is even more important when discussing ADHD and other exceptionalities. Loreman, Deppeler et al. (2005) argued that for teachers to be successful with inclusion they must not only have positive attitudes, but must honestly and openly reflect and address their own views and biases.
when it comes to disability and inclusion. Research suggests that pre-service teacher education is likely the best time to foster and develop these positive attitudes, because once formed, negative attitudes are difficult to change (Murphy, 1996). In order for pre-service teachers to address their own views and possible biases surrounding exceptionalities, they need an opportunity to discuss openly the topic and ask questions. Pro-active pre-service training is necessary to make sure that positive attitudes are internalized, further influencing pre-service teachers internal locus of control, to assist in reducing any bias about exceptional learners that the pre-service teachers may have when entering the program.

**Conclusion**

The findings of this study suggest that content knowledge may be acting as a barrier for pre-service teachers when attempting to maintain and develop an internal locus of control, when supporting students with ADHD and other exceptionalities, because of a connection between external factors and external locus of control. That is, without the necessary content knowledge in regards to ADHD, participants during their interviews and when interpreting the first vignette, felt that their inability to effectively support students was significantly challenged (i.e. internal locus of control) and placed the blame on external factors. However, when interpreting the teacher/student relationship in the second vignette, participants’ internal locus of control was able to take the forefront because they did not have to worry about external factors and they were able to focus in specifically on the teacher/student relationship.

Participants’ internal locus of control came to light throughout the study when participants shared that they wanted to help students succeed, and implement inclusive practices in their classes to support all students. However, a lack of content knowledge and external factors out of their control (lack of EA’s, large class sizes, etc), led to participants’ external locus of control taking over and an inability to fully execute classroom practices that the participants wanted to
implement. For example, participants may internally want to help students, but if they lack the proper knowledge (whether instructional or content knowledge), participants discussed using whatever they could to adapt to the situation at hand. This lack of knowledge was seen in both the questionnaire and interview findings. Participants described that they perceived their knowledge to be lacking due to weaknesses in their professional teaching programs, and discussed changes to the program that future pre-service teachers would benefit from.

**LIMITATIONS**

The most significant limitation of my study was my inability to get a baseline of the participants’ knowledge, attitudes, and perceptions of students with ADHD at the start of their bachelor of education program. Due to the design of the participating B.Ed. program, the students started their studies in the summer. Because ethical clearance was not received in time, I could not start collecting my data in the summer. I was not able to collect data on the participants’ knowledge, attitudes, and perceptions before they went on their observe and assist practicum and prior to their summer courses. Therefore, because I could not collect participants’ baseline knowledge, attitudes, and perceptions, I cannot be certain that the changes in the participants’ knowledge, attitudes, and perceptions are due to their coursework or practicum experience. I also could examine whether or not the participants knowledge, attitudes, or perceptions were developed prior to the program, or during. Collecting a starting point of participants knowledge, attitudes, and perceptions would greatly benefit future studies, in order to help future researchers understand what aspect of the B.Ed. program influences pre-service teachers’ knowledge, attitudes, and perceptions the greatest.

A second significant limitation of my study is my small sample size. I went through various forms of recruiting measures in an attempt to increase my response rate, such as sending my survey online through email, printing off the surveys and handing them out in classes and
recruiting through word of mouth in lectures. This resulted in an increase from an original four participants to 36. Although at time 1 I had 36 participants, at time 2, 8 participants chose not to complete the questionnaire. This resulted in an attrition of approximately 22% complete data, represented by a total of 28 participants who completed questionnaires at both time points. This small sample size is a limitation because the lack of significant findings could be due to a power issue. As well, more significant findings may have been visible if there was a bigger sample size. Results of this study also cannot be generalized to the entire primary/junior pre-service teacher population, due to such a small sample size. A much higher percentage of pre-service teachers participating in both the questionnaire and interview aspects of this study would have greatly benefitted this research project, as it would have allowed me to capture a greater breadth and depth of pre-service teachers’ knowledge, attitudes, and perceptions of ADHD.

Another reason that I cannot generalize my findings to the greater pre-service teacher population is because of the uniqueness of the B.Ed. program chosen. However, this challenge is something that most researchers will face in the future, given that there are regulations universities must follow in creating their B.Ed. program. For example, universities have core aspects that have to be included, but other aspects are left up to individual programs. Seeing as no program is the same, it would be hard to generalize pre-service teacher findings to most teaching programs.

**FUTURE IMPLICATIONS**

Results of this study have implications for future research and current practice. While there was small significant changes over time in regards to pre-service teachers’ knowledge, attitudes, and perceptions in the questionnaire findings, addressing some of the current limitations might assist future researchers target the areas of ADHD knowledge that pre-service teachers need to know before they become in-service teachers. As well, addressing these limitations will
also assist future researchers in narrowing down what B.Ed. programs can do to make sure that positive attitudes and perceptions of students with ADHD are being instilled in their pre-service teachers.

**Current practice**

Results from this study suggest that there may still be an issue with the design of teacher education programs. Studies have shown that “many teacher education programs have been criticized for being overly theoretical, having little connection to practice, offering fragmented and incoherent courses, and lacking in a clear, shared conception of teaching among faculty” (Darling-Hammond, Hammerness, Grossman, Rust, & Shulman, 2005). With the new extended program in Ontario, it would be more valuable of a learning experience if a large disconnect was not perceived between teacher education programs and classroom teaching experience. Studies have provided empirical evidence that suggested all teacher education programs who offered “coherent visions of teaching and learning, and that integrate related strategies across courses and field placements, have a greater impact on the initial conceptions and practices of prospective teachers, than those that remain a collection of relatively disconnected courses” (Darling-Hammond et al., 2005). It may be beneficial for teacher education programs to include real life examples of challenges in the classroom, while providing pre-service teachers with research proven tactics to address the challenges and giving them ample opportunities to discuss possible solutions. By doing so, pre-service teachers might feel more confident when heading into the classroom, knowing that they have discussed challenging situations and have the skills necessary to create solutions. This level of confidence might assist pre-service teachers to develop an internal locus of control.

This need to close the gap between teacher education programs and classroom practice was even more important when discussing ADHD and other exceptionalities. Loreman, Deppeler,
et al. (2005) argued that for teachers to be successful with inclusion they must not only have positive attitudes, but must honestly and openly reflect and address their own views and biases when it comes to disability and inclusion. Research suggested that pre-service teacher education is likely the best time to foster and develop these positive attitudes, because once formed, negative attitudes are difficult to change (Murphy, 1996). In order for pre-service teachers to address their own views and possible biases surrounding exceptionalities, they need an opportunity to discuss openly the topic and ask questions. Pro-active pre-service training is necessary to make sure that positive attitudes are internalized, further influencing pre-service teachers internal locus of control, to assist in reducing any bias about exceptional learners that the pre-service teachers may have when entering the program.

One implication for future practice that could assist in solving this issue of ineffective content would be implementing more real-life experience situations, and changing the content of the pre-existing exceptional learners course. Several studies have indicated “that the most effective way of altering attitudes in a favourable direction is to combine formal instruction either with structured and direct contact with people with disabilities (Ford, Pugach & Otis-Wilborn, 2001; Mayhew, 1994; Rees et al., 1991; Westwood, 1984), or with some other simulation or role playing activities that provide for more experiential learning (Forlin et al., 1999b; Pernice & Lys, 1996). A further alternative would be to have more guest lectures by individuals with exceptionalities, or individuals who have valuable insight to working with students with exceptionalities. Another suggestion would be to instil a field trip aspect to the course, where pre-service teachers can experience being in a classroom or facility with children with exceptionalities. By doing this, we are furthering pre-service teachers’ exposure to exceptional learners, in hopes to create more positive attitudes towards exceptional learners and further raise pre-service teachers confidence levels when working with these students.
A final implication for future practice would be to implement a classroom management course for all pre-service teachers. Participants in this study stated that they felt that they did not have enough knowledge of supports and different strategies to effectively manage students with ADHD and other exceptional behaviour. Specifically, participants are seeking further classroom management strategies to handle challenging behaviour, while also still supporting the rest of the needs in their classroom. Studies suggest that when discussing classroom management, you need to discuss both “establishing and maintaining order, designing effective instruction, dealing with students as a group, responding to the needs of individual students, and effectively handling the discipline and adjustment of individual students” (Whitney, Golez, Nagel, & Nieto, 2002). Although the definition of classroom management can be fairly broad, B.Ed. programs need to make sure that they are giving pre-service teachers strategies that are preventative, comprehensive, and most importantly, sensitive to the realities of the classroom. Studies suggest that once in the classroom, recalling previously learned strategies is not easy unless teacher education programs provide realistic and practical opportunities that connect teacher candidates with their future practice (Whitney et al., 2002).

Results of this study show that a longer mandatory course on exceptionalities is necessary and desired by students, in the B.Ed. consecutive program, in order to assist them in feeling more prepared to work with students with ADHD as well as with other exceptional students. This study suggests that one short course that only reaches surface level when discussing exceptionality content, is not enough to thoroughly prepare pre-service teachers to work with exceptional students. Having a longer mandatory exceptional learner course would be beneficial in order to further improve pre-service teachers’ knowledge of ADHD, seeing as this studies results showed that pre-service teachers still hold some misconceptions about the cause of ADHD, while also lacking a thorough understanding of the different subtypes and symptom knowledge.
Future research

While making sure that pre-service teachers have the necessary knowledge of ADHD is important, this study suggests that pre-service teachers also need further knowledge of what ADHD looks like in the classroom, more classroom management skills, as well as individualized strategies to effectively support and manage students with ADHD and other exceptionalities. A course on exceptionalities may not be beneficial unless it has the content that pre-service teachers want to learn and find valuable. This study suggests that pre-service teachers want to know the reality of what exceptionalities look like in the classroom. Pre-service teachers are also stating that they need more tools and strategies to adequately assist the exceptional student, while also supporting the other students in their classroom. Further strategies and tools will assist pre-service teachers in feeling more confident in their teaching abilities when heading out on their placement, and in turn, will help them feel more confident when tackling challenging behavioural situations in the future. Further research should examine whether this lack of knowledge extends to other exceptionalities that are considered “hidden” like ADHD, in order to make sure pre-service teachers are prepared on a larger scale to work with exceptional students in the general education classroom.

Future research should focus on identifying effective teacher education pedagogy in a more systemic way. Research has shown that teacher candidates make connections to the content that they explore in pre-service programs when it is presented in engaging and meaningful ways that relate to their experiences as learners and future teachers (Parkay, Stanford, & Gougeon, 2010). Results from this study suggest that there is still a lack of practice in course content, with a heavy emphasis on theory. Participants discussed feeling a lack of connection between what they were learning in courses and what they were experiencing on placement. Teacher education programs should not be relying on placement experiences to teach pre-service teachers important
topics such as classroom management or adaptations/interventions. Research shows that the quality of field experiences has a direct effect on the quality of teacher candidates’ learning experience within the program (Parkay et al., 2010). Seeing as teacher education programs cannot control what type of experience participants have while on placement, there is an even greater emphasis on the need for teacher education programs to properly prepare teacher candidates to handle challenging situations with exceptional students, which they may or may not have experienced on their teaching placements.
References


Ford, A., Pugach, M. A., & Otis-Wilborn, A. (2001). Preparing general educators to work well with students who have disabilities: what’s reasonable at the pre-service level? *Learning*


Appendices
Appendix A: Sample Interview General Questions

1. Why did you go into the teaching profession?
   a. Why primary/junior?
2. What has surprised you about teaching so far in your bachelor of education journey?
3. Would you say you had a positive or negative experience on your first teaching practicum?
   a. Could you please explain what made it positive/negative
4. Did you have a student with ADHD on either of your practicums?
   a. How did you know that particular student had ADHD?
   b. What symptoms would you say were most prevalent?
   c. Do you feel you had enough strategies to assist this student
5. Would you say you had a positive or negative experience with that student?
   a. Would you say that you felt stressed while working with this student? If so, what specifically caused you to experience this stress?
   b. In what ways did you cope with this stress?
   c. Were there other colleagues you turned to for assistance?
   d. Do you feel you had enough strategies to be able to cope with this student on your own?
6. In what ways do you feel that your coursework helped prepare you to work with students with ADHD?
   a. Did you feel that coursework alone gave you enough confidence when heading into your practicum?
7. Is there a course in particular that you feel you gained most of your knowledge from? And why?
8. What do you wish you could have learned more about?
   a. What do you wish you could have learned before going out on your first practicum that could have helped make your experience more positive?
9. In your opinion, would a mandatory course on exceptionalities be beneficial to all pre-service teachers?
   a. Please explain your thinking.
10. Would you say you are more confident or less confident in teaching students with ADHD after coming back from your fall practicum?
11. If I gave you a magic wand, and you waved it over the faculty of education and over the public school system, what would appear that ensures that teacher candidates and teachers in the field, are in a more effective position to support the educational experiences of students with ADHD?
Appendix B: Interview Protocol Tools-Vignettes

Vignette #1

Sarah is an eight-year-old girl, who is very artistic. She is compassionate, outgoing, and chatty. Sarah’s desk is often a mess and assignments hardly get handed in on time. Sarah tends to daydream and would rather talk about plays she writes in her spare time than do her deskwork. During class, Sarah would blurt out before she was called upon, and often paid attention to the wrong information in a lesson. Sarah loves being the teacher’s helper, but gets frustrated when she has to take turns. Sarah is strong in mathematics, but often becomes anxious during the math period and would attempt to get out of trying new math problems. Instead, she would tell her teacher she did not like math and that it was stupid. Language period was also a struggle for Sarah. Sarah and her classmates were told to silent read for twenty minutes, and Sarah would put her book away after five minutes. She would rather chat with her desk-mate or draw cartoon characters in her notebook. Sarah did not have a lot of friends and tended to isolate herself at recess. Sarah can sometimes be very emotional and is not sure how to make friends.

What is your first reaction towards Sarah’s behaviour?
Do you feel that ADHD symptoms present?
- If so, which ones?
Do you think the ADHD symptoms that are present would be different if the student were a male?
- if so, how?
- would any of Sarah’s symptoms be the same if she were a boy?
What difficulties may this student face in the classroom?
How could a teacher help this student in a classroom? (strategies, routine)

Vignette #2

Mark is the teacher of a grade 6 classroom at Swinfield Elementary School. He has one particular student in his class, Darren, who has a more difficult time in school than the rest of his peers both academically and socially. Darren comes off somewhat cocky to his peers, which causes social issues in Mark’s classroom. Mark likes Darren, but can get frustrated at times because he does not feel Darren is putting his best effort forward in his classroom. Mark does what he can to motivate Darren, but Darren just does not seem to be trying hard enough. Mark has given Darren extended time for his assignments, and an agenda to help Darren keep himself organized, but Darren refuses to use it. Mark has told Darren that if Darren does not pull his grades up, he could be asked to stay back a grade. Mark does not think that Darren cares about the consequences of his actions. Mark feels that he has done what he can, and now it is Darren’s choice whether he succeeds in school or not.

Describe the teacher/student relationship in this vignette.
- Is it a positive or negative scenario, and why?
How do you think the teacher perceives Darren’s behaviour/attitude?
What do you think the teacher is thinking in this scenario?
How would you react as an educator to having Darren in your classroom?
- Do you think you would feel or think similar things as this teacher? Or would you react differently?
Appendix C: Survey Letter of Information and Consent Form

INFORMATION/CONSENT FORM FOR ONLINE SURVEY

INCLUSION OF STUDENTS WITH ADHD: EXAMINING PRIMARY/JUNIOR PRE-SERVICE TEACHERS’ KNOWLEDGE, ATTITUDES, AND PERCEPTIONS

A MIXED-METHOD STUDY

This study is being conducted by Lauren Brick from the Faculty of Education at Queen’s University and has been granted clearance according to the recommended principles of Canadian ethics guidelines, and Queen's policies.

The purpose of this study is to examine pre-service teachers’ knowledge, attitudes, and perceptions of including students with ADHD in the general education classroom. The study consists of a four-part questionnaire, distributed at three different times. The study’s questionnaire will require approximately 35 minutes to complete each time. Following the questionnaire, four individual interviews will take place. The questionnaire data will assist in the selection of the four participants for the individual interviews. If qualified, you may be contacted near the end of the Fall semester to partake in a one-on-one interview. If selected for an individual interview, the interviews will require approximately 60 minutes to complete and will be audio-recorded. Further, participants are free to choose, without reason or consequence, to refuse to answer any questions in the interviews. Total completion time for this study is approximately 2 hours and 45 minutes over the span of approximately 7 months.

There are no known risks to participation in this study. Your participation is completely voluntary and you may withdraw from this study at any time without any consequences by emailing myself at 13lb32@queensu.ca or my supervisor Dr. Derek H. Berg at d.berg@queensu.ca explaining that you no longer want to partake in the study. However, if you choose to withdraw from the study, you can choose to have your data remain as part of the study or you may choose to withdraw and have your data removed from the study. If you choose to withdraw from the study and choose to have your data removed, it will be immediately destroyed. Copies of withdrawal emails will be saved in hard copy format and kept with the rest of the data in a locked filing cabinet. Regardless of whether you withdraw or continue, participation will not impact your grades, nor will your participation be known by your professor or fellow students.

Your answers will be identified by a codename only and all results will be confidential. Your contact information will be stored in a locked office in my supervisor's office. The data will be published or presented in a composite form only with no ability to trace you as an individual.

As an incentive to complete the questionnaire, you will be entered into a draw for a chance to win one of ten gift cards. If selected for an individual interview, a gift card will be used as an incentive with a 1 in 4 chance to win the gift card.

Any questions about study participation may be directed to Lauren Brick at 13lb32@queensu.ca or 519-505-7455. Any ethical concerns about the study may be directed to the Chair of the Queen's University General Research Ethics Board at chair.GREB@queensu.ca or 613-533-6081.
If you understand and accept these conditions, please indicate your electronic consent by selecting yes or no.

Yes  
I consent to participate.

No  
I do not consent.

** You may print this form for your records **
Appendix D: Interview Letter of Information and Consent Form

INTERVIEW LETTER OF INFORMATION &
CONSENT FORM

Inclusion of Students with ADHD: Examining Primary/Junior Pre-Service Teachers’ Knowledge, Attitudes and Perceptions

This research is being conducted by Lauren Brick (M.Ed. in Education, Candidate) under the supervision of Dr. Derek H. Berg in the Faculty of Education at Queen’s University in Kingston, Ontario. This study has been granted clearance by the General Research Ethics Board according to Canadian research ethics principles (http:/www.ethics.gc.ca/default.aspx) and Queen's University policies (http://www.queensu.ca/urs/research-ethics).

What is this study about? The purpose of my study is to examine pre-service teachers’ knowledge, attitudes, and perceptions of including students with ADHD in the general education classroom. Over the past two decades, there has been a prioritized shift in Ontario’s policy platform from traditional separate special education classrooms to a more inclusive, holistic approach. This recent widespread use of inclusive education practice in the general education classroom has established urgency for reform in teacher education. With ADHD occurring in approximately 3 to 6% of the childhood population, it is essential that we examine the extent to which pre-service teachers are trained on ADHD. I am particularly interested in the breadth and depth of teachers’ knowledge, attitudes, and perceptions about ADHD and whether they change over time (before/after practicum and before/after term coursework).

What is involved to participate in this study? There are different levels of participation in this study: a four-part questionnaire (distributed at three different times) and individual interviews. At this point in the study, you have completed the questionnaire and have been recruited to participate in an individual interview. Your interview will be approximately 60-minutes, where we will focus on your practicum and coursework experience. Your questionnaire data may be used as prompts for the interview, in order to help me capture your thoughts, reactions, and opinions on the topics related to ADHD. Think-aloud vignettes will also be used as prompts in the interview. One vignette will focus on teachers’ knowledge and attitudes, with the other vignette focusing on perceptions. The vignettes will consist of a case study, in which we will read together and then discuss what your thoughts, opinions, or reactions are to the vignette. Our conversations during the interview will be audio-recorded and transcribed for data analysis purposes. By choosing to participate in the interview stage of my study, you will receive a $25 visa gift card.

Is participation voluntary? Your participation is completely voluntary and choosing not to participate will not result in any adverse consequences. Further, you are free to withdraw from the study, without reason or consequence, and to refuse to answer any questions that make you uncomfortable or that you feel are objectionable. If you wish to withdraw from the study during the interview, you only need to ask that I stop the recording and indicate that you do not wish to continue. You may withdraw from the study at any time with no negative consequences, simply by sending an email to me or my supervisor (see below). You will be asked to indicate whether or not you would like part of all of your data removed from the study. I will send a confirmation
email back to you acknowledging your request to withdraw from the study either with or without your data removed. Copies of our email exchange will be saved in hard copy format and kept with the rest of the data in a locked filing cabinet. There are no known physical, psychological, economic, or social risks associated with this study.

What will happen to my responses? Your responses will be kept confidential. Only me and my supervisor, Dr. Derek H. Berg, will have access to this information. Given the small sample size for this study and the close-knit nature of the primary/junior consecutive education student community, it is possible that there is a potential of disclosure based on your comments or responses. However, your confidentiality will be maintained to the extent possible.

The interview recordings will be transcribed and then the recording will be destroyed. None of the data will contain your name; instead, a pseudonym will be used to replace your name.

Results from this study may be published in professional journals or presented at conferences, but any such presentations will maintain individual confidentiality. In accordance with the Faculty of Education’s policy, data will be retained for a minimum of five years. If data are used for secondary analysis they will contain no identifying information. All electronic files will be password protected. Paper and audio data will be secured in a locked cabinet.

What if I have concerns? Any questions about study participation may be directed to Lauren Brick at 13lb32@queensu.ca, or Dr. Derek H. Berg at 613-533-6000 (ext: 77413) & derek.berg@queensu.ca. Any ethical concerns about the study may be directed to the Chair of the General Research Ethics Board at chair.GREB@queensu.ca or 613-533-6081.

Please sign one copy of this Letter of Information/Consent Form and return to the researcher.
Retain a second copy for your records.

I have read the statements above and have had any questions answered. I understand that I will be asked to participate in one audio-recorded interview. I freely consent to participate in this study.

Participant’s Name (please print):

Participant’s Signature: ________________________________

Date: __________________________ E-mail address: ________________________________

☐ Please indicate, by checking the box, if you would like to receive a copy of the results of this study, via email.
Appendix E: GREB Approval

July 08, 2016

Ms. Lauren Brick Master’s Student  Faculty of Education Queen's University Duncan McArthur Hall 511 Union Street West Kingston, ON, K7M 5R7

GREB Ref #: GEDUC-816-16; Romeo # 6018662  Title: "GEDUC-816-16 Inclusion of Students with ADHD: Examining Primary/Junior Pre-Service Teachers’ Knowledge, Attitudes, and Perceptions"

Dear Ms. Brick:

The General Research Ethics Board (GREB), by means of a delegated board review, has cleared your proposal entitled "GEDUC-816-16 Inclusion of Students with ADHD: Examining Primary/Junior Pre-Service Teachers’ Knowledge, Attitudes, and Perceptions" for ethical compliance with the Tri-Council Guidelines (TCPS 2 (2014)) and Queen's ethics policies. In accordance with the Tri-Council Guidelines (Article 6.14) and Standard Operating Procedures (405.001), your project has been cleared for one year. You are reminded of your obligation to submit an annual renewal form prior to the annual renewal due date (access this form at http://www.queensu.ca/traq/signon.html; click on “Events”; under "Create New Event" click on "General Research Ethics Board Annual Renewal/Closure Form for Cleared Studies"). Please note that when your research project is completed, you need to submit an Annual Renewal/Closure Form in Romeo/traq indicating that the project is 'completed' so that the file can be closed. This should be submitted at the time of completion; there is no need to wait until the annual renewal due date.

You are reminded of your obligation to advise the GREB of any adverse event(s) that occur during this one year period (access this form at http://www.queensu.ca/traq/signon.html; click on "Events”; under "Create New Event" click on "General Research Ethics Board Adverse Event Form"). An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours.

You are also reminded that all changes that might affect human participants must be cleared by the GREB. For example, you must report changes to the level of risk, applicant characteristics, and implementation of new procedures. To submit an amendment form, access the application by at http://www.queensu.ca/traq/signon.html; click on "Events”; under "Create New Event" click on "General Research Ethics Board Request for the Amendment of Approved Studies". Once submitted, these changes will automatically be sent to the Ethics Coordinator, Ms. Gail Irving, at the Office of Research Services for further review and clearance by the GREB or GREB Chair.

On behalf of the General Research Ethics Board, I wish you continued success in your research. Sincerely,

John Freeman, Ph.D.  Chair  General Research Ethics Board
c: Dr. Derek Berg, Supervisor  Dr. Richard Reeve, Chair, Unit REB Ms. Erin Wicklam, Dept. Admin.