Examination of Training for Individuals Using ABA With Students Diagnosed With ASD

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Abstract

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder that affects the social communication and behaviours of individuals diagnosed; Applied Behavioural Analysis (ABA) is an evidence-based treatment for individuals with ASD and a teaching strategy that breaks down skills into smaller steps by using prompting and reinforcement (Mayer, Sulzer-Azaroff, & Wallace, 2014). Although the Ontario Ministry of Education's (OME, 2007) *Policy/Program Memorandum 140* (PPM-140) identifies ABA as a teaching method for educators, some parents are concerned that educational assistants who work one-on-one with students with ASD are not skilled enough (Nanowski, 2017). For the 2017-2018 school year in Ontario, a pilot project was conducted to increase the training of educational assistants through online learning programs (OME, 2017). The project focused on ABA-based professional development (PD) and sought to identify most effective types of PD and if experiential learning occurs. This paper examined the types of policies/PD opportunities offered within Canada and specific parts of the United States. Data analysis revealed each region had a different way of explaining its respective policy on teaching students with ASD; some clearly identified ABA as an evidence-based practice, some used tools based on ABA, while others focused only on inclusive education. Experiential Learning Theory's 4 steps—experiencing, reflecting, thinking, and acting (Yeganeh & Kolb, 2009)—were fully implemented within the PD of teaching staff concerning ABA and ASD in a few regions. To improve outcomes, each region can focus on integrating PD that completes the experiential learning cycle.

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Philippians 4:13 has always been an encouragement in my life.

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CHAPTER ONE: INTRODUCTION TO THE STUDY

This study examines the training of educators to apply Applied Behavioural

Analysis (ABA) as a teaching strategy in the Ontario educational system, for students

diagnosed with Autism Spectrum Disorder (ASD). ASD is a lifelong condition that can

affect all areas of life for individuals diagnosed. ASD is a neurodevelopmental condition

that creates difficulties with social communication, repetitive behaviours, and social

interactions for those diagnosed (Mayer, Sulzer-Azaroff, & Wallace, 2014). The first

national ASD prevalence rates estimated that 1 in 66 Canadian children and youths have

been diagnosed with ASD (Government of Canada, 2018).

Some behaviours exhibited because of difficulties with social communication

include lack of social-emotional reciprocity, narrow understanding of nonverbal

communicative behaviours, and difficulties with developing relationships (Carpenter,

2013). Restricted and repetitive behaviours are also commonly expressed with

individuals diagnosed with ASD through the resistance to change, stereotyped speech or

movements, sensory sensitivities, and limited strong interests (Carpenter, 2013).

Individuals diagnosed with ASD can also exhibit self-injurious behaviours (Banda,

McAfee, & Hart, 2012), have difficulties with daily living activities (Mays & Heflin,

2011), and have food aversions (Gale, Eikeseth, & Rudrud, 2011). As children with ASD

attend school, there can be difficulties with aggression, compliance, feelings of isolation,

and difficulties with transitions (Sansosti, 2012). Into adult life, adults with ASD must

overcome high levels of unemployment or underemployment as well as increased

feelings of not belonging to a community (Coleman & Adams, 2018).

ASD affects the behaviour and development of individuals diagnosed, which

leads to difficulties with social communication as well as decreased levels of functioning because of repetitive and restricted behaviours (Carpenter, 2013). Individuals diagnosed with ASD commonly suffer from an inability to understand social cues, lack empathy, cannot maintain eye contact or engage in make believe play, and exhibit delayed speech, rigid behaviours, as well as sensory sensitivities (Lindgren & Doobay, 2011). There can be developmental delays affecting acquisition of everyday living skills such as toileting, dressing, or eating (Lindgren & Doobay, 2011). Some negative behaviours that can be exhibited by individuals diagnosed with ASD depending on the context include biting, crying, screaming, running away, aggression, and self-stimulatory behaviours (Mayer et al., 2014).

Applied Behavioural Analysis (ABA) is an evidence-based treatment for individuals diagnosed with ASD (Mayer et al., 2014). As a lifelong teaching strategy ABA breaks down learning into smaller steps, taught one at a time by using prompting and positive reinforcement (Autism Canada, 2017a). Individuals diagnosed with ASD depending on their severity on the autism spectrum need assistance learning numerous skills such as socialization, self-help, academic, safety, and communication (Autism Canada, 2017a). ABA treatment has shown improvements with children diagnosed with ASD in language development, IQ scores, and adaptive functioning ((Hayward, Eikeseth, Gale, & Morgan, 2009). There also have been improvements with intensive ABA treatment in academic performance, personality, and decrease in problematic behaviours (Hayward et al., 2009). Dawson et al. (2012) found that early behavioural intervention can increase the brain activity for children with ASD with hopes of improving their social communication skills. To increase the play skills of students with ASD, behavioural

strategies such as modelling, prompting, and contingent reinforcement were used successfully to initiate social interactions between typically developed peers of student with ASD (Watkins, O'Reilly, Kuhn, & Ledbetter-Cho, 2019). In the Netherlands, when children with ASD were given Pivotal Response Treatment (PRT) or Treatment as Usual (TAU, parent training), there were greater levels of improved autism symptoms from PRT (Mohammadzaheri, Koegel, Razzes, & Rafiee, 2014). When both behavioural interventions and sensory-integration therapy were compared for effectiveness in reducing challenging behaviours with children with ASD, behavioural interventions were found to be a better treatment (Devlin, Healy, Leader, & Hughes, 2011).

Children with ASD can be seen as one of the most difficult student groups to teach (Corkum et al., 2014) because of communication and behavioural deficiencies that interfere with the learning process if not addressed early (Wilczynski et al., 2017). ABA has been an incorporated teaching method for students diagnosed with ASD in Ontario since 2007 (Ontario Ministry of Education [OME], 2007). To increase the success of students with ASD in school, an Identification, Placement, and Review Committee (IPRC) decides placement of students and Individualized Education Plans (IEPs) are created with ABA methods incorporated (OME, 2019). *Policy/Program Memorandum No. 140* (PPM-140) was created to inform school boards on how to use ABA principles as an instructional approach for students with ASD (OME, 2007). Based on the recommendations from the report of the Minister's Autism Spectrum Disorder Reference Group, advice was given to the Minister of Education and Minister of Children and Youth Services to create the PPM-140, which explains how to best provide evidence-based teaching practices that effectively meet the wide needs of students with ASD

(OME, 2007). The PPM-140 increases collaboration between parents of a student with ASD, schools, and the community in order to create the most suitable learning environment (OME, 2007). Creating an IEP is a group process with all stakeholders to ensure learning goals are set and problem behaviours are decreased (OME, 2007).

Background of the Problem

Despite the fact that PPM-140 mandates ABA practices in Ontario schools, a survey released by the Ontario Autism Coalition found 72% of parents with children diagnosed with ASD felt their children do not get the help they need in school (Nanowski, 2017). The parents who participated in the survey also felt staff within schools do not receive enough training (Nanowski, 2017). As suggested by Symes and Humphrey (2011), educational assistants surveyed do not think their generic training on ASD is sufficient and believe experience is more important for an inclusive school environment. Because educational assistants are tasked with working with students diagnosed with ASD one to one, there needs to be an examination of the professional development options. A previous study by the National Research Council found that general educators and special educators alike were not adequately trained in evidence-based teaching strategies based on the principles of ABA (Loiacono & Palumbo, 2011). As well, the pilot project targeting educational assistant training in Ontario was introduced as a first step to increase the integration of ASD supports in schools, with results of the pilot impacting future goals (OME, 2017). All children diagnosed with ASD exhibit different behaviours and cannot be taught in the exact same manner. There are some similarities but without adequate training working one to one with students diagnosed with ASD can become overwhelming for educational assistants or teachers.

The reality of what occurs within the school system for families with a child diagnosed with ASD is exemplified by Jack Skrt's story which was reported in the media: In 2017, the Skrt family lodged a human rights complaint against the Dufferin Peel Catholic District School Board to get ABA provided in their son's class as a teaching method (McQuigge, 2017). ABA is a scientific approach that must be understood and presented in a specific manner; without proper training, ABA cannot be effectively applied to teach Jack (McQuigge, 2017). The Ontario government has the policy in place to offer students with ASD special education accommodations that can include ABA (McQuigge, 2017).

Jack receives ABA therapy privately offsite, which has been beneficial (McQuigge, 2017). At school he has an education resource worker who the school board claims can work one-on-one with Jack but the worker was not able to provide the same level of treatment as an Registered Behaviour Technician (RBT; McQuigge, 2017). The Skrt family said they would pay for a private ABA professional to work with their son at school but the school board refused (McQuigge, 2017). Jack's family decided to send the issue to the Human Rights Tribunal of Ontario for the right to provide ABA for Jack in his classroom (McQuigge, 2017). In their defence the school board said it supported the provision of "appropriate educational services for all" (McQuigge, 2017, para. 6). The Human Rights Tribunal of Ontario interim decision allowed the Ontario Autism Coalition to be granted an intervener status (Human Rights Tribunal of Ontario, 2017). This status will allow the Ontario Autism Coalition to advocate for increased training of ABA therapy for educational assistants, provide clear definitions of IBI and ABA, as well as help provide solutions to create an inclusive school environment for students with ASD (Human Rights Tribunal of Ontario, 2017). The final decision occurred in September

2018 and the Tribunal decided to dismiss the application because Jack Skrt's team of professionals did not prove he needed ABA/IBI in the classroom to effectively access education, which means there was not a case for discrimination (Human Rights Tribunal of Ontario, 2019). In October of 2018, a Request for Reconsideration was filed and by January of 2019 this request was denied based on not fulfilling the test for Reconsideration (Human Rights Tribunal of Ontario, 2019). This is just one example of the disconnect experienced between the varying expectations of ABA methods that parents, educators, and community service providers hold. Increasing the amount of training for the teaching staff based on the Behaviour Analyst Certification Board (BACB) guidelines could improve outlooks of all stakeholders as well as increasing experiential learning for ABA.

Effective evidence-based ABA can only be administered as treatment by a RBT under the supervision of a Board Certified Behaviour Analyst (BCBA; BACB, 2019). Both professionals are required to pass competency exams, follow a code of ethics, and have many hours of hands-on experience working with individuals diagnosed with ASD (BACB, 2019). Educational assistants are the frontline workers with students diagnosed with ASD and if they are considered inexperienced by parents or other stakeholders then the professional development available should be improved based on experiential learning. With my previous experience working with children diagnosed with ASD, when I read Jack's school experience I wondered what could become a catalyst for change within the school system.

Statement of the Problem Context

The provincial government has reinforced ABA as an evidence-based teaching strategy and guiding principles for working with students diagnosed with ASD. The

OME and the Ontario Ministry of Children, Community and Social Services (2018) have implemented a pilot project in 18 school boards to improve the school supports for students diagnosed with ASD. Specifically impacting educational assistants, the project comprised a 40-hour online training module based on the RBT certification criteria to increase the understanding of behaviour and be prepared to support students diagnosed with ASD (OME, 2017). BCBA is a graduate level certification to become an independent professional applying ABA and qualifies individuals to supervise both Board Certified Assistant Behaviour Analysts (BCaBAs) and RBTs (BACB, 2019). To obtain the credential, candidates must have a graduate degree that relates to the field of ABA (e.g., psychology, education), have completed courses founded in ABA, 750-1,500 hours of supervised experience applying ABA, and passed an exam (BACB, 2019). The certification of BCBA-D is given to individuals with a doctorate degree but it has the same requirements and responsibilities as a BCBA (BACB, 2019).

A BCaBA is an undergraduate level of certification whose holders can supervise a RBT or others applying ABA but must be supervised by a BCBA (BACB, 2019). To obtain this credential, candidates must have an undergraduate degree in any subject, complete course work that is founded in ABA principles, have 500-1,000 supervised experience applying ABA, and pass the exam (BACB, 2019). A RBT is considered a paraprofessional who directly applies ABA treatment, needs to be closely supervised by BCaBA or BCBA, and does not create or analyze any treatment (BACB, 2019). To receive the certification, candidates must be over 18, have a high school diploma, 40 hours of training developed by BACB certificants, a criminal background check, and pass both RBT competency assessment (based on direct observation) as well as RBT exam (BACB, 2019). All BACB certified professionals have to adhere to BACB ethics codes

and maintain certification by annual renewal (RBT) or renewal every 2 years (BCaBA, BCBA, BCBA-D), as well as commit to continuous education in ABA (BACB, 2019).

Some educational assistants in a study by Symes and Humphrey (2011) discussed how few had previous experience working with children diagnosed with ASD and even for those who had experience, it was not specific to working within an inclusive classroom. Once starting as an educational assistant, different levels of training were provided such as information sheets, listening to speakers discussing ASD, or self-training options (Symes & Humphrey, 2011). Any formal professional development training the educational assistants received was not considered of use or helpful (Symes & Humphrey, 2011). A lack of detailed and experiential training can lead educational assistants to feel unsure of their place within a classroom, which creates a lack of working relationship between teachers and educational assistants. These findings are important to stress the need for comprehensive training not only for the educational assistants but for teachers as well to improve their inclusive classroom

To ensure students diagnosed with ASD receive the best educational experience, job-related training should be in a format that is most effective. The education system as a whole is questioned by parents in terms of if enough is being done to support their children diagnosed with ASD. When I decided to read the details of the pilot project, I was surprised to find that educational assistants were the only educators who were a part of the teaching staff selected to be part of the training opportunity (OME, 2017). To create an inclusive learning environment within schools, there needs to be a team approach to effectively implement ABA strategies. Educational assistants work one-on-

one with students diagnosed with ASD but teachers, principals, and other school staff should have basic training on ABA techniques.

Purpose of the Study

The purpose of the study is to further investigate the ABA teaching policy/program documents in Ontario for students diagnosed with ASD, compare policies in select regions of North America, and to determine if professional development offered to educators in the various regions follows the Experiential Learning Theory.

Theoretical Framework

Experiential Learning Theory describes learning as a process where experiences shape the creation of knowledge (Yeganeh & Kolb, 2009). Learners must go through the cycle of experiencing, thinking, acting, and reflecting for knowledge to be created (Yeganeh & Kolb, 2009). Examining the professional development offered to educators through the lens of Experiential Learning Theory can create an opportunity to examine how to improve their teaching pedagogy. Teaching students with ASD is a complex task and ensuring a quality education that also strives to be inclusive can be difficult. It is only by examining the current training methods that further suggestions be made for a suitable model in Ontario.

Rationale

Odom, Collet-Klingenberg, Rogers, and Hatton (2010) examined evidence-based treatments and identified 24 treatments as either behavioural teaching strategies or positive behavioural supports, with most treatments having a basis in ABA principles. A study by Odom, Boyd, Hall, and Hume (2010) found six comprehensive treatment models to be "model development" because of the efficacy in results. These treatments

include Learning Experiences- An Alternative Program for Preschoolers and Parents (LEAP), Lovaas Institute, Denver model, May Institute, and Princeton Child Development Institute (PCDI; Odom, Boyd, et al., 2010). Out of the 30 treatments examined, a majority was based on ABA principles (Odom, Boyd, et al., 2010).

The pilot project conducted in Ontario by the previous Liberal government was meant to be the first steps towards the integration autism supports into schools and to inform further decisions (OME, 2017). The aim of this research is to examine how other regions have taught evidence-based practices such as ABA to educators. By comparing and contrasting what polices as well as professional development are available in other regions in Canada and select states in the United States, Ontario can make an informed decision on how to best support students with ASD. Because it helps determine how best to service students with ASD, Experiential Learning Theory is utilized to determine the best training strategies Ontario could possibly adopt in the future.

Working with students diagnosed with ASD can be challenging and believing that one's abilities are enough to improve the skills of students with ASD or self-efficacy is important (Corona, Christodulu, & Rinaldi, 2017). Corona et al. (2017) highlight the positive impact of training on the self-efficacy of teachers as well as the benefits of having knowledge on evidence-based practices. Pre-service teachers as well experience inconsistent training on evidence-based practices from attendance at workshops and hands-on training to self-taught strategies (Morrier, Hess, & Juane Heflin, 2011). To combat this trend at an earlier stage of teachers' careers during teacher's college, students attending an Ontario university received over 3 hours of training on ASD and evidence-based treatments, which led to retention of knowledge (Leblanc, Richardson, & Burns, 2009).

A different method to combat inconsistent application and knowledge of ASD treatments is to offer online training (Marder & deBettencourt, 2012). Online learning has increased in popularity and advancements in technology make it easier to offer online training but some studies question whether deep learning occurs with an online-only model (Marder & deBettencourt, 2012). The shift in education towards online learning with unreliable retention rates caused Marder and deBettencourt (2012) to suggest and test a hybrid model. The hybrid model included 15 hours of face-to-face instruction, 10 hours of real-time instruction (synchronous), and 5 hours of "complete at your own time" activities (asynchronous; Marder & deBettencourt, 2012). Participants in the study answered surveys and found the hybrid training to be individualized as well as highly specialized, which positively impacts learning (Marder & deBettencourt, 2012). Web-based training with coaching/feedback as well can be examined for its effectiveness (Wilczynski et al., 2017). The web-based training provided information on ABA strategies through 17 hour modules (Wilczynski et al., 2017). The coaching/feedback occurred when a teaching session was watched by an experienced BCBA and areas that needed improvement were noted (Wilczynski et al., 2017). This method increases procedural knowledge, and by providing feedback in a natural setting there is potential for deep learning.

Educational assistants are an important part of educating students with ASD, which stresses the need for adequate training (Symes & Humphrey, 2011). Generic training was not considered to be helpful and there was greater preference for hands-on training methods (Symes & Humphrey, 2011). When educational assistants received web-based video modeling based on ABA methods with corrective feedback, there was

an increase in their skills which improved the learning experience of students with ASD

(Cardinal et al., 2017). Principals are tasked with supporting the teaching staff working

with students with ASD (Loiacono & Palumbo, 2011). When asked, principals stated

they would prefer to learn more about evidence-based treatments to improve their

inclusive learning environments (Loiacono & Palumbo, 2011). As a whole the teaching

staff surveyed in Nova Scotia favour multi-level in-service training on ASD (Corkum et

al., 2014). Teachers and educational assistants preferred workshops as well as

mentorships, while educational assistants stated the importance of hands-on training

(Corkum et al., 2014). Best practices for training school staff in ABA supported by the

reviewed literature are web-based training with coaching and feedback, hands-on

experiences with students with ASD, and specific sessions where information about ASD

and ASD is taught.

Objectives

This program evaluation attempts to answer the following research questions:

1. Educational assistants are offered online training through the pilot program in
   Ontario; is it an effective form of training for all educators?

2. Comparing policies on training of teaching staff on ABA in Canada and the
   United States, what are these policies and the context of services for children with
   ASD in each region?

3. Do any policies support Experiential Learning Theory of ABA teaching methods?

Scope and Limitations of the Study

The purpose of this study is to provide a program evaluation of ABA as a

teaching method for ASD students and to identify the types of professional development

offered for educators. It compare and contrast how special education is impacted by inclusive programming in different provinces and territories in Canada and a select few states in the United States of America. The use of online sources to discover what occurs in different areas can pose a limitation in this study. It can be difficult to interpret the true context of what is occurring in each region without having personal or direct experience with the different school boards and educators. This study can only provide an analysis of what is public knowledge of special education polices and what possible professional development is available.

Outline of Remainder of the Document

The remainder of this study will outline the literature on ASD as a lifelong neurodevelopmental disorder and will identify the best training strategies for teaching staffs to apply ABA strategies. Next there will be an explanation of methods and procedures of this study with the following chapter presenting results. Finally, there will be a discussion of results and future considerations for how best to improve teaching practices for teaching staff to ensure the best learning environment possible for students with ASD.

CHAPTER TWO: REVIEW OF THE LITERATURE

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder that affects the communication and social interaction of those diagnosed (Lindgren & Doobay, 2011). There can be an insistence on specific behaviours and limited interests, which can create challenges throughout the life of an individual diagnosed (Lindgren & Doobay, 2011). Being a spectrum disorder, the learning and thinking abilities of individuals with ASD can vary from gifted to limited abilities (Lindgren & Doobay, 2011). ASD has at least a four times higher prevalence rate for males than females, though females tend to suffer from a more severe diagnosis (Lindgren & Doobay, 2011). There is no known etiology of ASD but it is believed to be caused by an interaction of genetic and environmental factors (Lindgren & Doobay, 2011). Each individual diagnosed with ASD is unique and will require individualized learning goals based on their needs (Lindgren & Doobay, 2011).

Common characteristics of individuals diagnosed with ASD are: inability to understand social cues, inability to maintain eye contact, delayed speech, rigid behaviours, difficulties with make believe play, sensory sensitivities, and lack of empathy (Lindgren & Doobay, 2011). As well, there can be developmental delays depending on the severity of a child's diagnosis, which can affect the learning of skills for everyday living like toileting, eating, or dressing (Lindgren & Doobay, 2011). At times negative behaviours can be exhibited by children diagnosed with ASD depending on the environment/antecedents such as aggression, self-stimulatory behaviours, biting, crying, screaming, running away, et cetera, and the function of such behaviour can be determined through behaviour interventions (Mayer et al., 2014). Many of these characteristics are

exhibited by the age of 2 and a formal diagnosis can only be determined by medical

doctors, psychologists, and psychiatrists with experience diagnosing ASD (Lindgren &

Doobay, 2011).

ASD's Effects on Academic, Social, and Vocational Functioning

ASD affects each individual diagnosed differently. Being a spectrum disorder, no

one person exhibits similar behaviours, which leads to different severity levels

(Carpenter, 2013). A doctor, psychologist, or psychiatrist trained in ASD is required to

diagnose a person with ASD (Carpenter, 2013). The DSM-5 provides descriptions to aid

professionals in determining abnormal behaviour concerning social communication and

restricted as well as repetitive behaviours (Carpenter, 2013). The first guideline in the

DSM-5 concerns an individual having persistent deficits in social communication and

social interactions in various contexts, which cannot be explained by general

developmental delays (Carpenter, 2013). Such deficits are expressed as having a lack of

social-emotional reciprocity (limited initiation of social interactions, low levels of social

imitation, and a lack of sharing interests), limited nonverbal communicative behaviours

(limited eye contact, facial expressions, gestures, and body-language as well as no

understanding of others nonverbal communicative behaviours), having an inability to

maintain or develop relationships, and lacking interest in people (difficulties making

friends and adapting to different social contexts; Carpenter, 2013).

The second guideline relates to repetitive/restricted behaviour or interests. which

requires at least two of the four behaviours present when diagnosing (Carpenter, 2013).

This is expressed through stereotyped or repetitive speech, movements, and use of objects

(echolalia, rote language, repetitive sounds, non-functional play with objects, constant

hand flapping/clapping/spinning/swaying/covering ears), excessively following routines or resistance to change (rigid thinking, no understanding of humour/irony/sarcasm, resistance to transitions, verbal rituals), strong and restricted interests (obsessive/narrow interests, intense attachments to objects), and hyper/hypo reactions to sensory stimulus (odd response to specific sounds, increased levels of pain tolerance, interest or aversion to textures; Carpenter, 2013).

Determining if the behaviour affects or limits everyday functioning and if abnormal behaviours have been exhibited in early childhood are the final aspects of the guidelines to determine if an individual could be diagnosed with ASD (Carpenter, 2013). The severity of ASD is divided into three levels in the DSM-5 (Carpenter, 2013). An individual diagnosed within level 1 of severity would require some supports to decrease any impairments with social communication and with repetitive/restrictive behaviours (Carpenter, 2013). An individual diagnosed within level 3 of ASD would require substantial support, and there would be evident impairments even with supports available concerning nonverbal and verbal social communication skills (Carpenter, 2013). The restricted/repetitive behaviours can interfere with functioning in society, which can cause aggression if interrupting interest or rituals (Carpenter, 2013). An individual diagnosed within level 3 of severity would require substantial support because of severe impairments with social interactions, limited response to communication from other people, and an inability to express verbal or nonverbal social communication that impacts general functioning (Carpenter, 2013). It can become very difficult to try to stop any ritualistic routines and an individual within the level 3 diagnosis can be very fixated with repetitive behaviours that decrease functioning in all areas of life (Carpenter, 2013).

Self-injurious behaviours (SIB) frequently occurs with individuals diagnosed with an intellectual disability (Banda et al., 2012). Such behaviours are common with individuals diagnosed with ASD and are considered problematic because it can be harmful; for example, kicking, hitting eyes, face, slamming body into objects (Banda et al., 2012). Padded helmets, shoes, and protective clothing can be used to decrease the harm of SIB but to decrease the behaviour, an intervention plan can be created to decrease the occurrence (Banda et al., 2012).

Numerous individuals with ASD require assistance to complete self-care and daily living tasks (Mays & Heflin, 2011). Being solely dependent on parents or caregivers can affect the self-worth of individuals with ASD and for caregivers there is additional stress to complete daily living tasks (Mays & Heflin, 2011). The main goal of parents and caregivers is to increase the independence of individuals with ASD in order to try and meet societal expectations for autonomous adults (Mays & Heflin, 2011). To have an independent life, self-care skills such as eating, dressing, and toileting must be mastered (Cavkaytar & Pollard, 2009). Some individuals diagnosed with ASD can lack the ability to complete self-care tasks without some form of supervision and prompting (Cavkaytar & Pollard, 2009). Through a parent training program based on teaching self-care skills through ABA techniques taught and supervised by therapists, children in Cavkaytar and Pollard's (2009) study were successfully taught how to wash hands, put shoes on, and brush their teeth by breaking each skill into smaller steps.

Children who have difficulties eating can have various developmental consequences, such as lethargy, low weight, malnutrition, and stunted growth (Gale et al., 2011). When surveyed, out of 100 parents of children diagnosed with ASD, 67% stated

their children had eating issues and 73% stated their children had appetite but only for

their preferred foods (Gale et al., 2011). Issues parents experienced with their children

included preferences for only food of certain textures, tastes, temperatures, smell, and

appearance (Gale et al., 2011). As well, problem behaviours were exhibited when

children diagnosed with ASD try new foods, have to take medication, create rituals

around food, mouth objects and develop food selectivity (Gale et al., 2011). Other issues

parents experience related to their children diagnosed with ASD are food stealing, limited

self-feeding skills, vomiting, pica, and rumination (Gale et al., 2011). Food evasion or

any issues surrounding eating with children diagnosed with ASD can be maintained

through negative reinforcement from being able to escape from eating (Gale et al., 2011).

Functional assessments such as direct observations and interviews can determine why

food aversion occurs to create an intervention plan to increase food acceptance and

decrease problem behaviours surrounding food (Gale et al., 2011).

When students with ASD are engaged in repetitive behaviours (also known as

stereotypy behaviours), there is a block in social communication which decreases

adherence to teaching instruction (Haley, Heick, & Luiselli, 2010). Vocal stereotypy can

be defined as vocalizations of noncontextual speech, singing, humming, repetitive

sounds, and random phrases (Haley et al., 2010). Stereotypical behaviours are complex in

nature and are difficult to put on extinction (Haley et al., 2010). One form of treatment to

reduce the occurrence of stereotypical behaviour is an antecedent intervention where

students learn which visual cue permits stereotypical behaviours to occur or if it is not

allowed (Haley et al., 2010). Problem behaviours exhibited by individuals with ASD can

be problematic when the behaviours are stigmatizing, interfering, and disruptive

(Kozlowski, Wood, Gilligan, & Luiselli, 2009). Students with ASD can display disruptive behaviours such as spitting, screaming, crying, and grunting, which can affect the classroom environment and teaching instruction (Kozlowski et al., 2009).

Individuals diagnosed with ASD often have deficits in understanding unspoken rules in social situations, which can lead to social marginalization because of incorrect responses to social cues (Okada, Ohtake, & Yanagihara, 2010). As well there can be a slower development of theory of mind and difficulties with understanding the perspective of others (Okada et al., 2010). Typically developing children acquire theory of mind by the age of 4, and behaviour is understood or predicted by examining intentions, beliefs, and emotions about social events (Kail & Barnfield, 2009). Play skills is an essential part of the early childhood development of language and social skills (Palechka & MacDonald, 2010). Children with ASD have difficulties with pretend and symbolic play, which makes play an important skill to be taught through early intensive behavioural intervention (Palechka & MacDonald, 2010).

Children with ASD who are higher functioning (previously diagnosed as having Asperger's syndrome) during elementary school tend to be educated in general education classes with limited supports (Sansosti, 2012). As they progress into middle school or high school there can be an increase in behavioural problems such as noncompliance, aggressive behaviours (hitting, kicking, biting, damaging property, threatening), and tantrums (explosive and impulsive in nature; Sansosti, 2012). The nature of middle or high schools can make higher functioning student with ASD struggle to remain calm, have difficulties transitioning between activities, and suffer an inability to accept changes (Sansosti, 2012). An inability to control emotions and having emotional outbursts can

cause students with ASD to be placed in more restrictive school classrooms (Sansosti, 2012). Higher functioning students with ASD have benefited from being placed within general education classrooms with increased experiences with complex interactions and less non-social activities (Laugeson, Frankel, Mogil, & Dillon, 2009). A negative consequence from inclusive education is an increase in feelings of loneliness and lacking quality friendships (Laugeson et al., 2009). Adolescence is a difficult time for high-functioning students diagnosed with ASD because of greater awareness of difficulties interacting with peers and there is an increased pressure to fit in (Laugeson et al., 2009). This can cause students with ASD to feel rejected and isolated or they can struggle with being bullied (Laugeson et al., 2009). As compared to typically developing teens who can learn social rules from peer observation or advice from parents, adolescents with ASD require further instruction to learn social rules (Laugeson et al., 2009). Building friendships is also difficult for adolescents with ASD because there is a lack of understanding peer etiquettes and an inability to learn from peers because of limited positive encounters (Laugeson et al., 2009). There are lifelong impacts to teaching teens with ASD the needed skills to maintain friends that ensures as adults they will be able to have friendships and lasting community connections (Laugeson et al., 2009).

Unemployment or underemployment affect numerous adults with ASD (Coleman & Adams, 2018). A longitudinal study in the United States by the National Autism Indicators Report 2015 found that adults diagnosed with ASD had the lowest employment rates compared to other individuals with disabilities (Coleman & Adams, 2018). As well, some studies have found a correlation higher cognition when individuals with ASD are employed and higher perceptions quality of life is linked to job quality

(Coleman & Adams, 2018). Coleman and Adams (2018) through a survey discovered that there were five major barriers to employment for adults with ASD. There barriers included difficulties getting past interviews, uncertainty in what jobs to apply to, transportation, difficulties maintaining a job, and not being sure of what they wanted to do (Coleman & Adams, 2018). Coleman and Adams also found that Vocational Rehabilitation services had good client satisfaction ratings but were only effective in finding 19% of those surveyed a job. Transition services for students diagnosed with ASD aim to prepare the eventual movement from the school system into adult life, and are a mandated part of an IEP (Cimera, Burgess, & Wiley, 2013). Cimera et al. (2013) investigated if starting transitional services earlier at the age of 14 as compared to 16 years of age creates better vocational opportunities for students with ASD. Cimera et al. examined two groups of students with ASD for 4 years; one group had students receive transitional services at 14 and the other at 16 years. Cimera et al. found that the students who received the transitional services at 14 years were more likely to be employed, earned more money, and required less services.

Taylor, Smith, and Mailick (2013) found that increased engagement in community and vocational independence had a positive impact on increasing daily living activities for adults with ASD. As well, vocational independence and social engagement lead to a decrease in problem behaviours and behaviours typically experiences with individuals diagnosed with ASD (repetitive behaviours, deficits in communication, and restricted interests; Taylor et al., 2013). The stigma surrounding behavioural issues and difficulties adjusting to new environments is one of the barriers surrounding employment opportunities for adults diagnosed with ASD (Seaman & Cannella-Malone, 2016). To

improve employment outcomes for adults with ASD, Seaman and Cannella-Malone (2016) found that three sets of skills are necessary to be mastered: pre-employment, job task, and job retention. A longitudinal study over a 10-year period found that adults with ASD (especially women) declined in independence and vocational activities (Taylor & Mailick, 2014). As well, there was a link between having more services available and higher levels of vocational independence (Taylor & Mailick, 2014).

Treatment for ASD

ABA is focused on the prevention and reduction of problem behaviours, as well as examining the antecedents and consequences that maintain behaviours (Lindgren & Doobay, 2011). Research has suggested that ABA is most effective when started early in a child's development to improve long-term outcomes, though it can still be applied to all ages and capabilities (Lindgren & Doobay, 2011). ABA interventions must be individualized to the needs of the child with ASD in order to improve social and cognitive development (Lindgren & Doobay, 2011). Children who receive ABA have shown improvements with standardized measures of IQ, adaptive functioning, and language development as compared to other children diagnosed with ASD who did not receive ABA treatment (Hayward et al., 2009).

Teaching Strategies

ABA therapy can focus on improving problematic behaviours, academic performance, and personality (Hayward et al., 2009). Hayward et al. (2009) examined if after 1 year of intensive ABA treatment (1:1 ratio, 36 hours a week using discrete trial training, incidental and naturalistic teaching) there was any improvement in the children with ASD selected for the study. Treatment was provided to children in a clinical setting

or parent lead sessions based on the UCLA early intensive behavioural intervention that focused on increasing any behavioural deficits and decreasing any problem behaviours (Hayward et al., 2009). Both groups of children after a year saw improvements in IQ, visual-spatial IQ, social skills, language comprehension, expressive language, adaptive behaviours, and motor skills (Hayward et al., 2009). Previous research has found children with ASD continue to improve after the second and third year of treatment which led Hayward et al. to recommend children receiving treatment longer than a year.

Early Start Denver Model (ESDM) is a developmental behavioural intervention that improves the results of children with ASD and is based on the principles of ABA (Dawson et al., 2012). Comparing ESDM to community interventions, children who received ESDM for 2 years showed improvements in IQ, adaptive behaviours, and language development (Dawson et al., 2012). Children with ASD lack social engagement and could have negative effects on brain and behavioural development (Dawson et al., 2012). Dawson et al. (2012) sought to determine if there is a connection between early interventions increasing children's brain development towards a normal level. Electroencephalography (EEG) levels are measured while children with ASD and their typically developing peers viewed faces (social) and toys (non-social) stimuli (Dawson et al., 2012). At random, some children participated in ESDM and others community interventions (reading materials, resource materials, occupational therapy, speech-language therapy, ABA, etc.) for 2 years (Dawson et al., 2012). The children who were a part of the ESDM group had greater improvements in language, IQ, and social and adaptive behaviours as compared to the community intervention group (Dawson et al., 2012). When viewing the faces stimuli the ESDM group and typically developing

children had better cortical activations, which is linked to improve social behaviours, than the community intervention group (Dawson et al., 2012). Dawson et al. conclude that early behavioural interventions can improve brain activity patterns which can improve the social behaviours of children with ASD.

Odom, Collet-Klingenberg, et al. (2010) created criteria to determine which practices are evidence-based for children with ASD. A treatment would be considered evidence-based practice under three conditions, the first being at least two peer-reviewed studies need to be conducted by different researchers with experimental or quasi-experimental group design (Odom, Collet-Klingenberg, et al., 2010). The second condition is at least five single case design peer-reviewed studies need to be completed by at least three different sets of researchers (Odom, Collet-Klingenberg, et al., 2010). The third condition is complementary evidence consisting of at least one experimental or quasi-experimental study and three peer-reviewed single case design studies that are conducted by three different researchers (Odom, Collet-Klingenberg, et al., 2010). Their review of literature found 24 evidence-based practices, which can be divided into two categories: behavioural teaching strategies (based on ABA principles) and positive behavioural support (focused on reducing problem behaviours; Odom, Collet-Klingenberg, et al., 2010). Behavioural strategies determined to be evidence-based practices include: reinforcement, task analysis and chaining, prompting, naturalistic interventions, parent-implemented interventions, pivotal response training (PRT), computer-aided instruction, time delay, discrete trial training (DTT), picture exchange communication system (PECS), and peer-mediated instruction/intervention (PMII; Odom, Collet-Klingenberg, et al., 2010). Positive behavioural supports determined to be

evidence-based treatment include: differential reinforcement, social narratives, social skills training groups, video modeling, visual supports, structured work systems, extinction, self-management, functional behavioural assessments (FBA), response interruption/redirection, environmental modification/stimulus control, functional communication training, and VOCA/speech generating devices (SGD; Odom, Collet-Klingenberg, et al., 2010). Evidence-based practices should be individualized for each child diagnosed with ASD and used strategically to create the best results (Odom, Collet-Kingenberg, et al., 2010).

Comprehensive treatment models were examined to provide family members, service providers and researchers information for possible treatment adaption (Odom, Boyd, et al., 2010). The evaluations system created by Odom, Boyd, et al. (2010) had six features rated on a 5-point scale: implementation measures, types of empirical evidence, replication, operationalization, and complementary evidence from studies specifically on focused interventions and the quality of the research methodology. Treatment models that had higher ratings for the six dimensions were considered "model development" because the studies have been replicated, procedures are well documented, and there is some evidence of efficacy (Odom, Boyd, et al., 2010). "Model development" treatment includes: Learning Experiences- An Alternative Program for Preschoolers and Parents (LEAP), Denver model, May Institute, Princeton Child Development Institute (PCDI), and Lovaas Institute (Odom, Boyd, et al., 2010). Treatments that had some high ratings in four or less dimensions but had some features that can be beneficial, including: Developmental Individual Difference (DIR)/Floortime, Pivotal Response Treatment (PRT), Strategies for Teaching based on Autism Research (STAR), Treatment and

Education of Autistic and Related Communication Handicapped Children (TEACCH),

Response teaching, Autism Partnership, Centre for Autism and Related Disorders

(CARD), Social Communication Emotional Regulation Transactional Supports

(SCERTS), Children's toddler program, Douglass Developmental Disabilities Centre,

Therapeutic pathways/Kendall School, Miller Method, Pyramid approach to education,

Relationship Development Intervention (RDI), and Walden model (Odom, Boyd, et al.,

2010). Some treatments received low ratings: Higashi School, Eden Institute, Hanen

model, Son-rise, Summit Academy, Lancaster-Lebanon IU, Alpine Learning Group,

Project DATA (Developmentally Appropriate Treatment for Autism), Institute for Child

Development, and Valley Program (Odom, Boyd, et al., 2010). The 30 comprehensive

treatment models examined in the majority used an ABA framework for clinic, home-

based, or school-based treatment (Odom, Boyd, et al., 2010). Seven comprehensive

treatments were based on relationship and developmental theories (DIR/Floortime,

Denver model, Hasen model, Responsive teaching, SCERTS, Son-rise, and RDI) and

three were founded on differing theories Higashi School (stimulation of mind, body, and

stabilize emotions), TEACCH (based on various theories example behavioural,

developmental), and Miller Method (based on cognitive developmental framework)

(Odom, Boyd, et al., 2010).

Two interventions based in ABA were examined: PRT (a naturalistic teaching)

and a structured ABA approach (DTT) within a school environment (Mohammadzaheri

et al., 2014). Baselines were measured for the 30 children with ASD, and the group was

divided into two: one group received the ABA treatment and the other the PRT treatment

(Mohammadzaheri et al., 2014). Treatment occurred for 3 months, twice a week for 60

minutes each (Mohammadzaheri et al., 2014). The results found greater improvements for the children in the PRT treatment group, with Mohammadzaheri et al. (2014) believing the motivational aspects of PRT increased the verbal expressive communication of the participants with improvements in pragmatic skills. In the Netherlands PRT (20 sessions, 45 minutes each) and TAU (treatment as usual, parent mediation therapy and psycho education for varying hours) was provided as treatment for 6 months to 24 children diagnosed with ASD (Dulfhuis et al., 2017). The Autism Diagnostic Observation Schedule measured the effectiveness of both treatments and the children in the PRT intervention had improvements in autism symptoms (Dulfhuis et al., 2017). PRT as an intervention for children with ASD has been effective because of its basis in ABA principles and the use of individualized motivation to increase responses (Mohammadzaheri et al., 2014).

Behavioural Supports

Children with ASD suffer from deficits in social interactions and there has been research to support an increase in prosocial behaviours (Lindgren & Doobay, 2011). Prompting, contingent reinforcement, and modeling are behavioural strategies used to increase social interactions and playing with peers for children diagnosed with ASD (Watkins et al., 2019). Using peer-mediated interventions to develop the social skills of students with ASD has been studied (Lindgren & Doobay, 2011). Watkins et al. (2019) wanted to increase the social interaction children with ASD have with typically developing peers by teaching socialization through the use of an internet intervention that provides structured play activities. The play intervention focused on modeling, adult instruction, and answering questions, which lead to an increase in social interaction between all children (Watkins et al., 2019). As well, there was generalization of social

interactions to different peers and a maintenance of socialization skills after 6 weeks (Watkins et al., 2019).

Sensory integration therapy as an intervention for children with ASD has been favoured by families but controversial (Lindgren & Doobay, 2011). Many children with ASD have dysfunction with senses such as hypersensitivity or hyposensitivity and sensory therapies are designed by occupational therapists to focus on improving mental and sensory processing (Lindgren & Doobay, 2011). The effectiveness of sensory-integration therapy (e.g., swing, trampoline, balls, joint compression, brushing) and behavioural intervention (e.g., errorless teaching, differential reinforcement, variable schedule of reinforcement) in decreasing problem behaviours with children diagnosed with ASD was examined (Devlin et al., 2011). To determine how the challenging behaviours were maintained, researchers conducted a functional assessment (Devlin et al., 2011). The results were used to create individualized behavioural interventions and an Occupational Therapist advised on the sensory-integration therapy (Delvin et al., 2011). Using an altering treatment design, Delvin et al. (2011) found that the behavioural intervention was more effective in reducing challenging behaviours, which supports the evidence that sensory integration therapy has limited scientific evidence and was not examined objectively (Lindgren & Doobay, 2011). Treatment for ASD should be dependent on evidence-based strategies such as interventions based in ABA in order for the best outcomes for children with ASD.

Behaviourism a Foundation for Applied Behavioural Analysis

During the later years of the 19th century, the emergence of experimental psychology began with a focus on scientifically based experiments (Mayer et al., 2014). Researchers such as Wilhem Wundt and Edward B. Titchener focused on understanding

the mind (covert behaviours) with Sigmund Freud and Carl Jung focusing on mental

processes such as feelings, motivations and self-concepts (Mayer et al., 2014). Other

researchers such as Ivan Pavlov, John B. Watson, and B.F. Skinner focused on overt

actions to objectively determine human behaviours (Mayer et al., 2014).

Pavlov famously worked with the salivary responses of dogs to determine how to

change behaviour (Kail & Barnfield, 2009). His experiment used a neutral stimulus

(ringing bell) that creates no natural response and paired it with an unconditioned

stimulus (food) to create an unconditioned response—salivating hunger (Kail &

Barnfield, 2009). Pavlov would ring a bell, provide food to the dogs, and the dogs would

salivate (Kail & Barnfield, 2009). After numerous trials the dogs began to salivate as

soon as the bell was rung without the presence of food: a conditioned stimulus (bell) is

causing a behaviour (the conditioned response, salivating); this form of learning is known

as classical conditioning (Kail & Barnfield, 2009). Watson believed methodological

behaviourism can examine humans' and animals' actions to determine how behaviour

follows basic laws (Mayer et al., 2014). Principles of behaviour are scientifically proven

rules of nature that are based on the predictable interactions between individuals'

responses to arranged stimuli (events/objects that can influence behaviour; Mayer et al.,

2014). Watson applied the classical conditioning approach to experiments with humans

(Kail & Barnfield, 2009), which later influenced how ABA tries to change and

understand behaviour (Mayer et al., 2014).

Skinner thought that behaviours of humans and animals is based in science

(Mayer et al., 2014). He believed behaviour is defined as what an organism is observed to

be doing, only observable actions can be examined to determine the function of the

actions (Mayer et al., 2014). Skinner, through experimenting with animals in the Skinner box, observed that the consequences of behaviour determine if the behaviour continues (Kail & Barnfield, 2009). Operant conditioning modified behaviour based on reinforcement or punishment (Kail & Barnfield, 2009). Positive reinforcement is the addition of a stimulus to increase behaviour, an example would be providing praise to an individual for cleaning dishes that leads to an increase in the individual cleaning dishes (Mayer et al., 2014). Negative reinforcement is the removal of a stimulus that increases behaviour, for example nagging an individual to clean dishes: the nagging ends when dishes are cleaned so there is an increase in cleaning to avoid nagging (Mayer et al., 2014). Positive punishment is the addition of stimulus that decreases behaviour, an example is a teacher tells a student he/she is disappointed because a class was skipped and it does not occur again (Mayer et al., 2014). Negative reinforcement is the removal of a stimulus that decreases behaviour, for example a teacher takes away a lunch break for student who skips class and the student does not skip anymore (Mayer et al., 2014).

Skinner's research was primarily conducted on animals but child-development researchers discovered operant conditioning can be applied to change children's behaviour (Kail & Barnfield, 2009). Learning occurs through behavioural changes; an individual has learned when there is observable changes in behavioural patterns based on environmental events (Mayer et al., 2014). To determine the function of behaviour, the ABCs of behaviour are recorded and examined: Antecedent is the environment/stimulus before a behaviour; Behaviour is the actions expressed; and Consequence is anything that happens after a behaviour which can be reinforcement, punishment, or extinction (Mayer et al., 2014). By observing and recording the ABCs of behaviour, the four functions of

behaviour (escape, wanting tangibles, attention, and self-stimulatory behaviours) can be determined and a strategy can be implanted to change behaviours (Mayer et al., 2014). Through the foundation of classical and operant conditioning, ABA was created to apply the discovered principles of behaviour to create behaviour changes that is adaptive and ethical (Mayer et al., 2014). The focus of ABA is to create effective teaching methods (e.g., telling, guiding, showing, using differential reinforcement) to learn how to change behaviours (Mayer et al., 2014).

Applied Behavioural Analysis

ABA stemmed from behavioural psychology and from the beginning there has been a focus on providing applied research that is socially appropriate based on the scientific method (Baer, Wolf, & Risley, 1968). It is a teaching method that breaks down skills into smaller functional steps and is considered an evidence-based approach by being scientifically proven to be effective with individuals diagnosed with ASD (Mayer et al., 2014). As a teaching strategy, ABA encourages learning of new skills through prompting, guiding, showing, or differential reinforcement (increasing reinforcement of desirable behaviour while putting on extinction negative behaviours; Mayer et al., 2014).

Lovaas (1987) was the pioneer in creating behaviour modification treatment (ABA) for children diagnosed with ASD. Lovaas conducted a long-term experiment (2 years) with young children diagnosed with ASD. The experimental group received 40 hours of one-to-one intensive therapy per week provided by well-trained student therapists and the control group received one-to-one intensive therapy with less frequency, 10 hours per week (Lovaas, 1987). The experiment's results concluded the children in the experimental group who received 40 hours of therapy per week had better

academic outcomes as compared to the control group (Lovaas, 1987). Since this initial experiment, there has been a focus on providing children diagnosed with ASD the earliest possible behavioural intervention. Within the school system, educational programming for students diagnosed with ASD should focus on the acquisition of social play, learning academic skills, and increasing communication (Lindgren & Doobay, 2011). From the time of Lovaas's experiment to the present, ABA has developed as a field that prides itself as being an evidence-based solution to improve the lives of individuals diagnosed with ASD.

ABA is a teaching method that not only improves the behaviours of students with ASD but also follows a scientific approach to ensure an objective lens is used to analyze the success of the treatment plan. ABA is a teaching method based on applied research that is used to help individuals learn new skills while through a precise intervention plan decrease any problem behaviours (Lindblad, 2006). Through the examination of antecedents within an environment, positive reinforcement as a teaching strategy, and the measurement of behaviour through direct observation, ABA is an intervention that can create lasting and meaningful change for children with ASD (Lindblad, 2006). The use of effective teaching techniques such as prompting, prompting fading, shaping, forward chaining, and backward chaining within the school system can be extremely beneficial for students diagnosed with ASD (Lindblad, 2006).

Can it be expected for general education teachers or educational assistants with varying amounts of experience with students with ASD to be tasked with creating an inclusive environment? If teachers and educational assistants are willing to learn more about evidence-based teaching practices for students with ASD, how much training can

truly prepare them for the complex needs of students with ASD? The purpose of this study is to examine types of training and teaching strategies applied to students diagnosed with ASD.

Training Practitioners to Implement ABA in School Environments

On the surface, it may seem anyone can deliver ABA as a treatment, but to ensure the principles are understood and a lack of initial progress is not mistaken for ABA being ineffective, educators need in-depth training (Lindblad, 2006). Corona et al. (2017) found that evidence-based practices (e.g., ABA, PRT, TEACCH) were inconsistently implemented within schools, which can negatively affect students with ASD achievement levels. As well, knowledge of an evidence-based practice did not always translate into teaching practice (Corona et al., 2017). When teachers do not receive the training needed to implement available evidence-based practices, such teaching methods are not reliably applied in schools (Corona et al., 2017).

To determine the effect training had on educators across New York State, 10 professionals participated in three training sessions on the Prevent Teach Reinforce model (PTR, derived from ABA; Corona et al., 2017). The first session was 10 hours of training divided into 2 days and provided an introduction to ASD, ABA principles, PTR model, and data collection methods through didactic presentations (Corona et al., 2017). As well, hands-on training was provided through an exercise of applying the learned knowledge to work on collecting data for a target behaviour of two students with ASD (Corona et al., 2017). The second session was 10 hours of training over 2 days focused on interpreting the data and creating a behaviour plan for their selected students (Corona et al., 2017). Before their last training session, the educators were asked to collect data for

3 to 4 weeks on their behaviour plan and at the final 5 hour training session the progress

of the students was reviewed with a discussion of any problems (Corona et al., 2017).

The results of the study by Corona et al. (2017) showed that educators'

knowledge increased after partaking in the training sessions and there was an increased

belief in their ability to work with ASD students. These findings highlight the need to

provide educators quality training to work with ASD students with varying needs

(Corona et al., 2017). Corona et al. found that to increase outcomes, training strategies

such as coaching and feedback should be offered instead of seminars and dialectic

lectures. Having the opportunity to put theory into practice with the guidance of an expert

can be a beneficial experiential learning experience. This training format allows for three

out of four aspects of the Experiential Learning Theory cycle: experiencing, thinking, and

acting. During the three PRT training sessions, teachers were able to experience hands-on

how to create a behavioural plan for students diagnosed with ASD. A benefit of delaying

the third session for about a month created an environment for acting out the new

teaching strategies and thinking about how to correctly provide collect direct

observations as well as analyze the results. What is lacking in this training approach is a

focus on teachers reflecting on this new teaching strategy, how it can impact their

teaching practice, and how it will change the goals of their schools' teaching team.

Students diagnosed with ASD are a heterogeneous population; what is effective

for some children will not be effective for others, which makes training for teachers and

support staff a complex task (Morrier et al., 2011). For general education teachers,

training on special education tends to be a single introductory course that does not dive

into details on how to improve inclusion of ASD students or attend to their individual

education needs (Morrier et al., 2011). The study conducted by Morrier et al. (2011)

focused on determining the training teachers receive for ASD students in Georgia, USA.

Through the Autism Treatment Survey, 90 teachers reported their teaching practices and

the level of training on evidence-based treatment strategies for ASD students (Morrier et

al., 2011).

Results from Morrier et al.'s (2011) study found that less than 5% of teachers

used evidence-based practice for their students diagnosed with ASD. Common training

methods that were reported included attendance at workshops full or half day (21%),

hands-on training with students with ASD (19%), and self-taught methods (18%; Morrier

et al., 2011). Other less common training methods included learning from parents of a

student with ASD (2%), program developer leading sessions (1%), internal school system

training (10%), and university-based teacher preparation programs (15%; Morrier et al.,

2011). This study highlights the difficulties educators face when working with students

diagnosed with ASD. There was no standard teaching method used to teach students with

ASD, even though many studies highlight the effectiveness of evidence-based treatments

such as ABA. As well from pre-service teaching programs to professional development,

there was no consistency in how knowledge about ASD and effective teaching methods

are disseminated. Now knowing the level of training teachers have received within the

selected schools in Georgia, USA, a training module can be created that focuses on the 4

aspects of Experiential Learning Theory. Students with ASD require different learning

styles, can have difficulties with communication, be resistant to change, have different

speech patterns, and exhibit repetitive body movements, which all affect possible

integration into a general classroom (Leblanc et al., 2009). Leblanc et al. (2009) found

that there is a lack of training at the university level for teachers to integrate special needs

students into the general classroom when teachers should know how to program for the

unique needs of ASD students.

From these findings Leblanc et al. (2009) wanted to investigate the effect of ASD

professional development training on teachers in the beginning of their career. The

School Support Program-Autism Spectrum Disorder (SSP-ASD) sought to increase

educators' ability to meet the needs of ASD students in Ontario, through a 3-hour 20-

minute training divided into two sessions, offered to university students in a bachelor of

education program (Leblanc et al., 2009). An ASD Inventory developed by the

Algonquin Child and Family Services SSP-ASD was used in the pretest/posttest design to

measure prior knowledge and how much was retained 2 months after the training sessions

(Leblanc et al., 2009). The results of this study showed how a limited amount of

professional development within teacher training can increase teachers' perception and

technical knowledge of ASD (Leblanc et al., 2009). As well, there can be an increased

knowledge of evidence-based practices plus a decrease in anxiety when students with

ASD need to be integrated into a general classroom (Leblanc et al., 2009).

This training method utilized to train students in teacher's college focuses on

thinking within the learning cycle of Experiential Learning Theory. Using the pretest-

posttest experimental design, only the retention of technical knowledge is examined.

Having experience working with students diagnosed with ASD would improve teachers'

outcomes in meeting the needs of their students. To fulfill the learning cycle there should

be an addition of acting such as creating an inclusive classroom for students with ASD.

As well, including a reflective aspect of the training program can allow for an

opportunity to examine what barriers exist within their schools that limit students diagnosed with ASD and how to best create an inclusive classroom environment for all students.

Marder and deBettencourt (2012) clearly state what most expect from educators working with ASD students: "specialized needs require specialized training" (p. 13). This point should be greatly stressed when ASD students are the fastest growing population within special education (Marder & deBettencourt, 2012). The National Research Council in the United States recommends that educators working with ASD students have training in a variety of areas such as ABA, physical structures, naturalistic instruction, language interventions, full inclusion, correct data collection methods, augmentative and alternative forms of communication (PECS, Prologo2go), as well as visual systems (Marder & deBettencourt, 2012).

Online instruction and distance learning can be a training method for educators who live in rural areas or have various personal responsibilities (Marder & deBettencourt, 2012). When examining how online instruction could aid in training educators working with ASD students, Marder and deBettencourt (2012) studied how a hybrid model could be used. Five graduate level courses where offered within three semesters for educators to learn about evidence-based practice to work with students with ASD (Marder & deBettencourt, 2012). The hybrid model consists of 5 hours of asynchronous activities, 10 hours of synchronous online instruction, and 15 hours of face-to face instruction for the participants of the study (Marder & deBettencourt, 2012). Using a hybrid model allowed for highly specialized and individualized training for special educators even if they did not live close to a major city (Marder & deBettencourt, 2012). What needs to be

considered before completing online training is that some teaching methods may not be effectively presented through online learning, such as data collection methods and observing behaviours (Marder & deBettencourt, 2012).

This form of training is heavily focused on the thinking aspect of learning within the Experiential Learning Theory. There is a focus on increasing the knowledge of teachers for evidence-based practices. For this model of training to create lasting results there should be a focus on teachers experiencing teaching with evidence-based strategies. Having hands-on experience is important to handle any challenging behaviours exhibited by students with ASD. The next step would be to start acting on using evidence-based strategies such as ABA in order to create individualized learning for students with ASD. As well, teachers reflecting on past experiences working with students with ASD can stop future reliance on unproven strategies. There can also be a reflection by teachers on how much more knowledge they can learn about ASD, ABA, and further education available that includes more hands-on experiences.

Another form of web-based training, Autism Training Solutions, is studied for its effectiveness on training educators to work with students diagnosed with ASD (Wilczynski et al., 2017). Autism Training Solutions is a commercial training package teaching ABA strategies through video modules in which one must pass a learning criterion to move on to the next level (Wilczynski et al., 2017). In between knowledge acquisition, teaching sessions between teacher and student were recorded, afterwards coaching and feedback was offered by a BCBA (Wilczynski et al., 2017). This case study focused on a special education preschool teacher completing 17 hours of Autism Training Solutions and recording six teaching sessions with a 5-year-old student with ASD

(Wilczynski et al., 2017). The results of this case study found the teacher increased in both knowledge acquisition and procedural knowledge of ABA strategies by the combination of web-based training with coaching and feedback (Wilczynski et al., 2017).

The four aspects of Experiential Learning Theory are included within the training format of web-based training with coaching and feedback. A teacher who completes this commercial training package learns the ABA teaching strategy and can immediately apply it with a student. There is an opportunity to think about the step by step process of teaching using ABA strategies and the possible outcomes of students. With feedback and coaching being offered by a BCBA, expert options can cause reflection on how teachers can improve their performance, which will lead to teachers acting out their improved understanding of how to teach student with ASD.

Experiences of Educational Assistants

Teachers have explained their increased difficulties when integrating students with ASD as compared to other students with intellectual disabilities (Symes & Humphrey, 2011). The ability to support students with ASD depends not only on teacher experience but also on the availability of support staff (Leblanc et al., 2009). This highlights the importance of support staff, specifically educational assistants, when working with students diagnosed with ASD. The main role of educational assistants is to include and support students with various forms of disabilities including ASD (Symes & Humphrey, 2011). With an increased worry of students with ASD having negative experiences within general education classrooms (Symes & Humphrey, 2011), educational assistants are vital to bridge the gap to create an inclusive environment.

Having previous experience working with students diagnosed with ASD is beneficial to not only support these students but also to assist teachers (Symes & Humphrey, 2011).

The amount of training educational assistants receive needs to meet the demands of the job (Symes & Humphrey, 2011). Symes and Humphrey (2011) examined the experiences of educational assistants working with ASD students by conducting semi-structured interviews with 15 educational assistants from the north-west of England. Many of the educational assistants reported having no previous experience before starting their current role and they did not find generic training on ASD to be helpful (Symes & Humphrey, 2011). Types of training they experienced included an information sheet on ASD to read, debrief on the students they would be working with, and some experienced internal training from the school or outside agencies to discuss ASD (Symes & Humphrey, 2011). As well, formal training was not considered helpful as compared to learning from practical experience with their students (Symes & Humphrey, 2011). Knowing that all students with ASD have various needs, a focus on formal training that is experiential might change perceptions of its usefulness.

Currently there is no specified manner to best provide educational assistants working with ASD students professional development and ongoing support that is evidence based (Cardinal et al., 2017). Providing training that focuses on instructional methods and specialized interventions can improve the performance of students with ASD (Cardinal et al., 2017). Four educational assistants from western USA, with no experience in ABA, participated in a study with four students to learn ABA methods (Discrete Trial Teaching, DTT) using web-based video modelling (Cardinal et al., 2017). Using a pretest/posttest design model each training video is 3 1/2 minutes with 10

sessions in addition to brief corrective verbal feedback after trying the discrete trial

teaching technique (Cardinal et al., 2017). The finding in this study showed an increase in

skills of educational assistants delivering ABA interventions (DTT) and an increase in

fidelity from the brief corrective feedback (Cardinal et al., 2017). Students with ASD can

be provided evidence-based teaching strategies by educational assistants no matter where

they live or socioeconomic status because of the availability of web-based training

(Cardinal et al., 2017).

Experiences of School Administrators

Principals have a vital role in the care team for students diagnosed with ASD.

They are tasked with supporting and evaluating teachers as well as educational assistants

even though they might not have the needed skills, training, and confidence in evidence

based practices (Loiacono & Palumbo, 2011). To determine the comfort levels of

principals to support their staff working with students diagnosed with ASD, Loiacono

and Palumbo (2011) conducted a study surveying 51 principals in southeastern New York

state. The study found principals who understood ABA methods have a higher level of

confidence when supporting educators working with students with ASD (Loiacono &

Palumbo, 2011). When examining the types of ABA training principals have received, 16

had taken courses in undergraduate or graduate school in special education, 12 had

professional development in special education, and 20 had received support from other

support staff (e.g., former psychologist, special education teacher; Loiacono & Palumbo,

2011). For further training, 12 principals suggested evidence-based practices based in

ABA, 11 for Positive Behavioural Supports (influenced by ABA), eight wanted support

from special education administrative staff, four wanted opportunities to observe ABA

programs, and two would prefer training in special education law (Loiacono & Palumbo, 2011). It is interesting to note how much willingness principals have to learn more about ABA which can create the best learning environment for students with ASD and a supportive work environment for all staff.

This study highlights the need for principals to be in a supportive role within the teaching staff who are working with students with ASD. A supportive principal can increase the ability of their teaching staff to fully engage in Experiential Learning. The results indicates principals are able to act on their previous experience with ASD and assist the teaching staff to create an inclusive class experience. There is also a reflection by some teachers that they do not have expert level knowledge on how to create an inclusive school environment and there is willingness to engage in further training. In order to have the best outcomes, hands-on training should be the training format chosen by principals. As well, including opportunities to think about the positive impact further knowledge and hands-on experience in ABA strategies can improve teaching outcomes.

Joint Experiences of Teaching Staff

Educators—from teachers, educational assistants, to specialists—all want further research in professional development opportunities for working with students with ASD within inclusive education (Corkum et al., 2014). Researchers conducted three focus groups within the Annapolis Valley Regional school board in Nova Scotia to determine the needs and barriers to inclusive education of students with ASD (Corkum et al., 2014). All the educators thought training on effective strategies should include hands-on learning opportunities and should be available quickly; for example, when a student enters a new class or is first diagnosed with ASD (Corkum et al., 2014). Teachers are

responsible for creating programs for their students while educational assistants are responsible with implementing the programs (Corkum et al., 2014). A variance in skills and knowledge exists between teachers and educational assistants because educational assistants are provided focused professional development related to ASD and interventions while teachers complete professional development on broader topics (Corkum et al., 2014). Participants of this study found the varying expectations between teaching staff troubling because it can create inconsistency in approaches which decreased the effectiveness of the programming (Corkum et al., 2014). As well, their current model of one-time professional development on the topic of ASD is not enough and should be ongoing, multilevel in-service training (Corkum et al., 2014). Teachers and educational assistants alike found they learned the most from workshops and mentorship from experienced colleagues, while educational assistants where more favourable to hands-on training (Corkum et al., 2014). This could explain why educational assistants rated their level of comfort supporting student with ASD 25% higher than teachers (Corkum et al., 2014).

Best Practices for Training School Staff to Implement ABA

Web-based training with coaching and feedback, hands-on experiences with students with ASD, and specific sessions where information about ASD and ASD are disseminated should be a part of professional development for educators. The first best practice identified was that training should incorporate hands-on experiences that allowed school staff to actively apply the evidence-based ABA strategies. This is consistent with Experiential Learning Theory. Experiential Learning Theory describes learning as a process where experiences shape the creation of knowledge (Yeganeh & Kolb, 2009).

Learners must go through the cycle of experiencing, thinking, acting, and reflecting for knowledge to be created (Yeganeh & Kolb, 2009). Applying the Experiential Learning Theory to professional development of educators can create a standard to compare the quality of available training approaches.

The second best practice identified was specific sessions that provide more information on ABA as a teaching strategy. This includes workshops, dialectic lectures or a hybrid instruction model, which is a combination of web-based and in person learning, to improve knowledge about students with ASD and learn how best to apply ABA strategies. Teaching teams could be provided with time to reflect on the provided training and how it related to their teaching practice. The next chapter will explain methods and procedures for this study.

CHAPTER THREE: METHODOLOGY AND PROCEDURES

In this paper provinces and territories in Canada are examined to compare and contrast governmental policies/programs for teaching students with ASD. As well, the types of available professional development for educators will be examined to determine if the training follows Experiential Learning Theory. Specifically in Ontario, the pilot project to train educational assistants with 40 hours of online training based on the criteria of the RBT certification will be studied. As well, how ABA methods that are mandated by the PPM-140 is outlined in Ontario's special education documents will also be examined. Select American states will also be studied to determine their governmental polices/programs for students with ASD, what types of professional development is available, and if the training has the four components of the Experiential Learning Theory. The United States has the Individuals with Disabilities Education Act (IDEA) that governs the entire country to ensure special education for students that are eligible (IDEA, n.d.a). I decided to include select American states in this research to examine if there would be any differences in special education policies or available professional development.

Document Analysis

A document analysis is a research tool that examines the language, words, or text in a document to understand what is said and what is left unsaid within a government's policy (Cardno, 2018). By focusing on the content of selected documents, inferences can be made by the inclusion or absence of key terms or phrases (Cardno, 2018). In the field of special education, there has been a consensus shift towards inclusive educational practices but examining the policies in a document analysis allows for an in-depth examination of teaching methods of educators and available levels of professional

developments. Document analysis was the chosen research method to interpret provincial/territorial/state policy on special education and teaching techniques utilized for students with ASD (Cardno, 2018). Examining policy documents is beneficial to understand the source and scope of complex educational issues (Cardno, 2018). By completing a document analysis and comparing special education documents of various regions, there can be an investigation to the scope and source of this educational issue, to make suggestions to improve outcomes for the future.

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Sources of Information

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First, in order to understand strategies educators are expected to apply when teaching students with ASD, an examination of special education policy occurred. In Canada, education is regulated according to provincial or territorial governments. By looking at the special education documents that are available online, it can be determined if there is a focus on teaching with ABA strategies. In the United States education is regulated by the states but special education is influenced by a federal regulation: the IDEA. By referring to the IDEA legislation and special education policies of individual states online, there can be an examination of the teaching strategies using ABA principles. Second, the treatments each province/territory/state provides to children with ASD was searched online to determine if any services can be beneficial for the education system or can provide educators with additional professional development. In addition, any available documents that provide results from committees that examined recommendations for the future of inclusive education were examined as potential policy directions. Third, an examination of which provinces/states have regulations for professionals who apply ABA principles while working with individuals with ASD is

conducted online. The Behaviour Analyst Certification Board (BACB) offers certification in ABA application and examining how the completion of the certification as a professional development opportunity is analyzed, as a possible avenue to increase the use of ABA within school settings.

Data Collection Techniques

As a research method, document analysis is cost-effective, manageable, and effective (Cardno, 2018). This study aims to discover if other regions have similar expectations for the use of ABA methods in schools or different expectations for teaching methods for students with ASD are used in different jurisdictions. A document analysis was chosen to investigate the research questions because it would be costly and difficult to visit each province/territory/state to observe how students with ASD are taught in public schools. As well, the examination of documents does not require any ethical approval, which would differ if human subjects were interviewed which could have led to numerous delays or complications (Cardno, 2018). Document analysis is an effective practical tool within research (Cardno, 2018). It can be used in educational settings to increase awareness of challenges in policy implementation and lead to the improvement of such complex policies (Cardno, 2018).

Special education policy specifically directed towards educating students with ASD in Canadian provinces and in some selected U.S. states is reviewed. The first step was to conduct an internet search for each provinces/territory/state funded website where education policy is available for the public to read. Once the education policy was located on the website, a search was conducted to determine if there is a specific document outlining education for ASD students; if not, special education policy was read to locate

the section on how students with ASD are taught. Internet searches were also conducted to determine types of treatment or services the government provides funding for to assist children with ASD. As well, there is an investigation for any information concerning available professional development courses, activities, or learning materials. At times when the education documents referred to another website that described professional development opportunities, the materials present on that website were also analyzed. An internet search for any provincial/territorial/state BACB certification process that can provide specific professional development in ABA was also conducted.

Criteria for Evaluation

The primary purpose of this study is to examine the documents on special education in schools and see if ABA strategies are mentioned in relation to working with ASD students and how the strategies are implemented. If ABA was not mentioned explicitly, there was an attempt to determine what methods are used to teach students with ASD. As well, to determine if the chosen methods are evidence-based and founded in ABA principles, policy documents and program documents were compared to the evidence-based criteria for effective ABA. The requirements within each province/territory/state regarding regulations for applying ABA to students were noted, whether provided by the BACB or any other organizations. It was examined if each province/territory/select states have regulation boards to become a behaviour analyst to determine if there is an effect to the school system. In addition BACB various levels of certification require hands-on training by qualified BCBA, which can create an ideal experiential learning experience.

There will also be an examination to determine if any of the four aspects of Experiential Learning Theory is present within professional development mentioned in any education policy documents and program documents. The four aspects of Experiential Learning Theory include experiencing, reflecting, thinking, and acting (Yeganeh & Kolb, 2009). In relation to professional development experiencing refers to hands-on training with students that can be required and reflecting occurs after possible feedback given from training or coaching. Thinking describes an examination of theory relating to the training and acting occurs when theory becomes action, the application of the professional development in the school environment.

Analysis of Data

Specifically, types of treatment funded by the provincial/territorial/state governments and age ranges for possible treatment will be analyzed. In addition, there is a review of special education policies and examining types of certification available to become a behaviour analyst. How the findings are interpreted will be influenced by Experiential Learning Theory and through deductive analysis on the importance of completing each step in the learning cycle to have lasting knowledge (Yeganeh & Kolb, 2009). Best practices of experiential learning examined in the previous chapter create the categorization for the chosen document to be analyzed (Cando, 2018). Ontario's policy with respect to training for individuals using ABA with students with ASD will be critically analyzed and recommendations will be made for further research with possible policy suggestions. As well, the findings of the document analysis will be summarized with descriptions of the text and a table.

CHAPTER FOUR: PRESENTATION OF RESULTS

This chapter will focus on analyzing the education policy and evaluating

programs for children diagnosed with ASD. In addition to examining types of available

professional development for educators to improve their teaching practices with students

with ASD. Depending on the region and what is available online, specific documents for

teaching students with ASD, chapters dedicated to teaching students with ASD or

inclusive education policy for special education students were examined. The teaching

strategies adopted within each region were examined to determine if they were evidence-

based. Experiential Learning Theory was explored as an evaluation tool to measure the

effectiveness of available professional development for educators and a possible way to

improve future training.

Canada

Within Canada educational policies are determined by provincial or territorial

governments. Below each province/territory programs available for individuals with

special needs specifically ASD is evaluated.

Ontario

Policy. A pilot project was launched in Ontario for the 2017-2018 school year and

its aim was to improve the learning experience of students diagnosed with ASD (OME,

2017). The pilot project was available in 18 schools and offered three initiatives: provide

space within schools for external ABA professionals to provide treatment, allow

educational assistants access to voluntary 40 hours of online training and professional

development sessions, and provide funding for an ABA expert with a BCBA certificate

(OME, 2017). The hope of the pilot was to reduce transitions for students with ASD from

school, home, and off-site ABA centres (OME, 2017). As well, the project is aimed to improve educators' skilled support of students with ASD through professional development (OME, 2017).

PPM-140 was invoked as a framework for school boards in 2007 and had the goal of incorporating ABA methods into programs for students with ASD (OME, 2007). The requirements of the PPM-140 is for the teaching team to create an Individualized Education Plan (IEP) within 30 days of the student's start date and to ensure special education programs are offered (OME, 2007). Specifically these ABA methods are applied when appropriate for students with ASD: individualized programs, positive reinforcement when teaching, observed data must be collected then analyzed, and there should be a focus on generalization of skills (OME, 2007). As well, the PPM-140 requires school boards to plan for all forms of transition (with a coordination between home, school, and community agencies) from class to class, different grades, school to off-site agency, and to decrease the possibility of challenging behaviours ABA methods should be utilized (OME, 2007).

Programs. In the beginning of 2018, the Ontario Ministry of Children, Community and Social Services (OMCCSS) announced clinical staffing requirements for the new Ontario Autism Program. The new regulations would require clinical supervisors to have one of the four qualifications: BCBA, BCBA-Doctoral, clinical psychologist. or psychological associate with ABA experience (OMCCSS, 2018). Clinical supervisors must also have at least 3,000 hours of post-certification experience with 1,500 being supervisory experience, professional liability insurance, vulnerable screening check, and follow the professional code of conduct outlined by the BACB or College of

Psychologists of Ontario (OMCCSS, 2018). Front-line therapists such as senior therapist or ABA therapist are required to have a vulnerable sector check, while the rest of their qualifications are recommended, including professional liability insurance, and they must follow a professional ethics code (OMCCSS, 2018). A senior therapist should at least have either a BCBA/BCaBA certification with 3,000 hours of supervised delivery of ABA services or 4,500 hours experience delivering ABA under supervision of BCBA/registered psychologist with ABA experience (OMCCSS, 2018). ABA therapists are recommended to have either a RBT certification, university degree related to the field (ABA, psychology), 1 year experience with ABA services under supervision of a senior therapist or clinical supervisor or a college diploma related to the field (Early Childhood Education, Autism and Behaviour Services, etc.; OMCCSS, 2018). The Ontario Autism Plan provides funding for children under 17 to receive support in schools, at home, and in the community, based on ABA principles (Autism Canada, 2017b).

Nova Scotia

  Program. The provincial government of Nova Scotia set up an advisory team to suggest how to support individuals with ASD throughout their lifespan (Autism Management Advisory Team, 2013). The research conducted by the Autism Management Advisory Team (2013) advised to invest in increasing early intensive intervention based on evidence-based practices. The government provided funding for PRT which is a form of ABA but to children under the age of 5 and there has been long waiting periods (Autism Canada, 2017b). Once in the school system, children with ASD are no longer eligible for PRT (Autism Canada, 2017b). Within the school system, the government provided a $200,000 grant for the professional development of the teaching staff, to hire an autism consultant, and supported school boards to have autism support

teachers/specialists to help with programming as well as any training needs of educators (Autism Management Advisory Team, 2013). New actions advised to the government included having a full-time autism consultant to lead needed professional development and increasing content of ASD in university courses, as well as to provide funding to school boards for professional development, increase resources according to the needs of students with ASD ,and support transition planning (Autism Management Advisory Team, 2013). The Nova Scotian government committed to track and monitor the lifespan of individuals with ASD to determine if progress is made (Autism Management Advisory Team, 2013).

Policy. It was decided to further study if behaviour analysts would be beneficial as additional support to treat behavioural issues in schools (Autism Management Advisory Team, 2013). A commission for the inclusive education in Nova Scotia found that there was a lack of education within teacher education on how to create an inclusive school environment. This could be changed by ensuring future teachers have practicums and coursework focused on inclusive education (Njie, Shea, & Williams, 2018). Current teachers could receive professional development that is timely, practical to students' needs, interactive, school based, and individualized to educators (Njie et al., 2018). To provide inclusive education the report suggested an increase in skilled educational assistants and other professionals working with students (Njie et al., 2018). It was also stressed that principals have a huge role in the impact of inclusive education and should receive training in leadership in order to create lasting change within their schools (Njie et al., 2018). There is also a focus within the report for evidence-based practices, procedures, and polices in order to ensure inclusive education, in addition to a focus on the success of all students (Njie et al., 2018).

The inclusion education report with consultation with parents found there needs to be more professional development for teachers, educational assistants, and administrators in order to meet the needs of students with ASD, as well as an increase in specialized education programs to train ASD specialists (Njie et al., 2018). Teachers should learn about ASD and evidence-based practices in teacher's college, while educational assistants should partake in more training and continuing education courses (Njie et al., 2018). These changes will create an inclusive learning environment for students with ASD but it was not specific as to what types of evidence-based practices would be adapted into schools. There does not seem to be a provincial certification to become a BCBA or RBT which could impact why ABA was not specified as a teaching method for students with ASD.

Manitoba

Program. The provincial government in Manitoba has funding for two programs based on evidence-based practices. Autism Outreach uses scientifically based interventions that aim to improve communication, self-help and social skills for children with ASD (Manitoba Department of Families, n.d.). An autism specialist is hired to work on individualized programs for home and to assist with the transition into the school system, as well as offering to train professionals at child care centres to create an inclusive environment that can meet the needs of children with ASD (Manitoba Department of Families, n.d.).

St.Amant Autism programs specifically use ABA principles when working with children with ASD Manitoba Department of Families, n.d.). The St.Amant Early Learning Program focuses on intensive one-to-one teaching that is parent lead and can be

accessed until a child is 5 years old (Manitoba Department of Families, n.d.). Once a child is transitioned into the school system, there is a 1-year period where support is offered to school professionals and for caregivers (Manitoba Department of Families, n.d.). Until a student with ASD graduates high school, the St.Amant Classroom Consultative Support Services offers help to school teams to work on social skills and challenging behaviours experienced within inclusive classrooms (Manitoba Department of Families, n.d.). Professional development is offered by the Manitoba Education and Advanced Learning to consult teachers from Manitoba Adolescent Treatment Centre Neurodevelopmental Services on programming for complex needs(Manitoba Department of Families, n.d.). As well, support and professional development opportunities are available to school staff from St.Amant Autism Programs and Student Services Unit of Manitoba Education and Advanced Learning (Manitoba Department of Families, n.d.). Manitoba does not currently have its own certification process to become a BCBA or other related credentials and any professional would have to get certified through the BACB.

     Policy. The resource publicly available for school staff to teach students with ASD focused on ABA as a general aspects of on behaviour modification and not an intensive teaching strategy that must be supervised by an expert (Manitoba Education, Citizenship and Youth, 2005). Teaching strategies such as focusing on the motivations of students with ASD, having structured routines, or using a visual schedule to transition between activities are based on behaviourism as well as terms such as behavioural shaping, task analysis, discrete trial methods, prompt hierarchies and positive reinforcement (Manitoba Department of Families, n.d.).

British Columbia

      Policy. In British Columbia, up until age 18 the provincial government provides higher amounts of funding to preschooler for autism interventions as compared to school aged children (British Columbia, n.d.). There is no mention of evidence-based treatments or ABA, which can allow parents to choose what they feel will work best for their children. Within BC's special education policy, individualized programming is expected and specialist teachers should have training in behaviour management as well as know how to foster skills development in students with ASD (BC Ministry of Education, 2016). Educational assistants should be trained in observing behaviour, collecting data, use behaviour strategies to shape behaviour, and stimulate communication skills (BC Ministry of Education, 2016). The expectations of educational assistants when working with students with ASD is rooted in ABA and professional development is meant to development these skills (BC Ministry of Education, 2016).

      Program. There appears to be a strong push towards increasing ABA services within British Columbia with the BC Association for Behaviour Analysts fighting for regulations for BCBA (BC-ABA, 2019). In the school system Provincial Outreach Program for Autism and Related Disorders (POPARD, n.d.) provides training, support, and consultations for educators to improve their ability to work with students diagnosed with ASD. An introductory course in ABA is offered at POPARD (n.d.), a 30-hour, 5-day training that allows educators an opportunity to learn about evidence-based practice. With the recent addition of a short-term intensive intervention for students with demanding behavioural challenges, POPARD is offering a training for educators in Intensive Behavioural Support (POPARD, n.d.).

Alberta

  Program. The provincial government of Alberta provides funding for various

services to families with children diagnosed with ASD through the Family Support for

children with Disabilities (Autism Canada, 2017b). Services are provided based on

assessment needs until a child is 18 and some services available are autism therapy (e.g.,

IBI founded in ABA), school supports (e.g., transition planning), child care, and respite

services (Autism Canada, 2017b). Evidence-based practice Positive Behavioural Supports

(based in ABA principles) is offered as additional resources (Alberta Government, 2014).

In Alberta, parents have the choice to enrol their children in specialized schools that

focus on ABA teaching strategies based on a needs assessment (Canadian National

Autism Foundation, 2004). These schools are either public or private school and receive

some funding from the provincial government (Canadian National Autism Foundation,

2004).

  Policy. Within the school system the teaching staff provided individualized and

effective programming by working as a team sharing information on ASD, as well as

strategies to meet the needs of students with ASD (Alberta Education, 2004).

Professional development is offered to teaching staff to learn best practices and

specialists are available for consultation (Alberta Education, 2004). Instructional

strategies such as breaking down complex tasks into smaller skills, using prompting, and

positively reinforcing appropriate behaviours are considered a part of effective

programming based on ABA principles (Alberta Education, 2004). Even though ABA is

not specifically mentioned in Alberta's special education policy, the principles are

adapted to teach students with ASD. In the province there is no regulation board and any

expert would have to be certified through the BACB. To handle challenging behaviours, teaching staff are advised to conduct a Functional Behavioural Assessment (FBA) to create a behavioural plan to determine why such behaviours occur (Alberta Education, 2004). It is noted that typically an expert such as a behaviour specialist or psychologist should conduct this assessment (Alberta Education, 2004). Having a certified expert can increase the chances of behavioural change occurring and to ensure the task is not harmful to the child.

Saskatchewan

Program. The Government of Saskatchewan (n.d.a) has individualized funding for ASD interventions that allow parents to choose what they would prefer for their children to partake in up until the age of 6. When giving parents the power of choice, the government still provides a short and easy to understand fact sheet that differentiates the difference from evidence-based practices and emerging practices for ASD therapy (Government of Saskatchewan, n.d.a). It is clearly described that interventions that are evidence based have large amounts of research to support its effectiveness, for example ABA, PRT, PBS, and DTT (Government of Saskatchewan, 2011). Emerging evidence treatments have shown some effectiveness with children diagnosed with ASD but a smaller amount of evidence is available; for example, PECS, TEACCH, Cognitive Behavioural Interventions (Government of Saskatchewan, 2011).

Policy. When a child with ASD enters school the special education policy used PRT principles such as individualized programing, structured classroom environment, visual schedules, meaningful reinforcers, and teaching skills in natural environment; for example, prompt inclusive peer interactions during recess (Saskatchewan Education,

1999). Consultation and professional development for educators is provided by the Special Education Unit, but there is no mention if specific training will increase educators' knowledge in PRT or in ABA in general (Saskatchewan Education, 1999). The Cognitive Disability Strategy offers funding for school support and provides training for individuals working with cognitive disabilities based on individual needs (Government of Saskatchewan, n.d.b).

Saskatchewan currently does not have a regulation board to become a BCBA and when considering improving additional support within the school system a behaviour analyst is not on the list (Government of Saskatchewan, 2017). The 4 professionals considered to increase supports in schools social worker, occupational therapist, psychologist and speech and language pathologist which all have licencing board with codes of ethics (Government of Saskatchewan, 2017). These professionals will be contacted for professional development and consultation purposes (Government of Saskatchewan, 2017).

New Brunswick

Program. Children diagnosed with ASD can receive funding for 20 hours of EIBI (Early Intensive Behavioural Intervention) based on ABA until the age of 5 (Government of New Brunswick, n.d.). As children with ASD transition into the school system, training and different resources are available to teaching staff and autism agencies (Government of New Brunswick, n.d.). One of these resources is an online training module, available across Atlantic provinces, that teaches about ASD and behavioural interventions (Government of New Brunswick, 2015). The online training is available for educators to increase their skills and ensure individualized effective programming is

utilized (Government of New Brunswick, 2015). Within special education policy, to strive for an inclusive learning environment there are school-based educational support services to help the teaching team to create and implement effective teaching strategies (New Brunswick Department of Education and Early Childhood Development [NB-DEECD], 2013). As well, support from other professionals is available for consultation on the effectiveness of school teams and provide professional development to improve the skills development of educators (NB-DEECD, 2013).

Policy. Also within the special education policy is the use of Positive Behavioural Interventions and Supports (PBSI) which is an evidence-based approach founded in ABA (NB-DEECD, 2017). The focus of PBSI is to use direct observation that is tracked to determine how to create a positive learning environment for academic and social achievement of students (NB-DEECD, 2017). When training is provided at individual schools it is recommended to use the practice and provide feedback model (NB-DEECD, 2017) which is beneficial to experience hands-on training. Many professionals are a part of the District-based education support services but no specialist in behaviour was suggested to consult or provide professional development. In New Brunswick there is no regulation board to become a BCBA.

Newfoundland and Labrador

Program. In Newfoundland and Labrador, children diagnosed with ASD receive Early Intensive Behavioural Services, based in ABA principles 30 hours a week until the end of kindergarten and then 15 hours until the end of grade 3 (Autism Canada, 2017b). When experiencing severe behaviours an individual diagnosed with ASD can be referred to the Community Behavioural Services Program where a behavioural management

specialist conducts a functional assessment (Autism Society of Newfoundland and Labrador, 2019a, 2019b).

Policy. Within the school board children with ASD receive individualized programing and are taught using ABA principles, such as visual aides, discrete trials, task analysis, using meaningful reinforcers, and providing a structured classroom environment (Government of Newfoundland and Labrador, 2003). To improve social interactions of students with ASD, PRT is used as an intervention during recess to encourage all students to play together (Government of Newfoundland and Labrador, 2003). Training is offered to the teaching staff to handle all sorts of transitions that can become challenging within schools and the complex need of students with ASD (Government of Newfoundland and Labrador, 2003). The Student Support Services Division provides professional development and support to schools who require assistance with students diagnosed with ASD (Government of Newfoundland and Labrador, 2003).

In Newfoundland and Labrador there is no regulating board to certify BCBA, which might impact the number of behaviour analysts hired within the school board. FBAs are also mentioned to find alternative behaviours to replace challenging behaviour (Government of Newfoundland and Labrador, 2003).

Prince Edward Island (PEI)

Program. Funding in PEI is given for preschool children to receive 15-20 hours of IBI (based in ABA) and for the Early Years Autism Specialist to work with the child, family, and school board to ease the transition into the school system (Government of Prince Edward Island, 2018). The Early Years Autism Specialist can provide Intensive Kindergarten Support for students during their first year of school who need specialized

and frequent instruction (Government of Prince Edward Island, 2018). As well the Early Years Autism Specialist would assist the teacher in individualized programming, dealing with challenging behaviours, and adapting curriculum (Government of Prince Edward Island, 2018). School-based Autism Consultants support students with ASD throughout their years in school based on individual needs (Government of Prince Edward Island, 2018).

Policy. PEI's education documents state children with ASD should be taught using ABA methods and through individualized programming (PEI Department of Education, Early Learning and Culture, 2015). ABA is described as an evidence-based practice that requires anyone who provides services using ABA should be properly educated with pre-service training and professional development is necessary (PEI Department of Education, Early Learning and Culture, 2015). School boards must ensure Board Autism Consultants have the required education, experience and training for the role in addition to using ABA research when creating services for student with ASD (PEI Department of Education, Early Learning and Culture, 2015). Board Autism Consultants and the teaching staff must work together to create an IEP and monitor students progress using scientific methods (PEI Department of Education, Early Learning and Culture, 2015).

In PEI there is no regulating board to become certified as an BCBA but in the education documents certification from the BACB is accepted and expected (PEI Department of Education, Early Learning and Culture, 2015). Board Autism Consultants and Early Years Autism Specialist at minimum are required to have a Master's degree in a related field (education, psychology, special education), extensive training in ABA with

a minimum of two courses in ABA or Autism, in addition to 3 years of direct experience working with students with ASD preferably in a school and knowledge of current evidence-based practices for students with ASD (PEI Department of Education, Early Learning and Culture, 2015). Preferred qualifications include completing seven courses in ABA or Autism at the graduate level (approved by BCBA) and being certified by the BACB (PEI Department of Education, Early Learning and Culture, 2015).

Quebec

Program. In Quebec, children under age 5 with ASD can attend autism therapy up to 20 hours a week (Autism Canada, 2017b). The school system in Quebec codes students according to their learning disability, learning difficulty, or physical disability (Advisory Board on English Education, 2006). If a student with ASD is coded as a student with Pervasive Developmental Disorder (PDD, classified under ASD in DSM-V) their teaching environment would need to be structured, instruction is presented one at a time, many breaks are offered, visual aides are used, and numerous reinforcement opportunities is available (Quebec Provincial Association of Teachers, 2017). As well, services would be offered throughout the day by social workers, psychologists, or psycho-educators and educational assistants would adapt materials, environment, et cetera to support students with ASD (Quebec Provincial Association of Teachers, 2017).

Policy. ABA teaching methods are not mentioned in any of the documents I have reviewed and there are no current regulations for a BCBA certification in the province. There is a Centre on Excellence on Autism Spectrum Disorder which provides consultation and training for teachers on the complex needs of students with ASD (Advisory Board on English Education, 2006). With an inclusive classroom environment,

the centre focuses on dispelling myths about ASD and stressing the need for accommodations (Advisory Board on English Education, 2006). There is no mention of training methods but hopefully there is a focus on evidence-based practices. Within the Special Education Policy, methods to determine student success are focused on providing reliable results and needed services (Gouvernement du Québec, 2007). The English school system in Quebec may need to work on a system that clearly states how students with ASD are taught, what methods are used, and how the methods are chosen.

Northwest Territories

Program. Children diagnosed with ASD in Northwest Territories receive IBI until the age of 6 and once in schools have access to educational assistants and other services (Autism Canada, 2017b). The school policy is based on inclusion education where all children can learn with age appropriate peers (Government of Northwest Territories, 2016). Teachers are supported through the School-based Support Team and Specialized Inclusive Schooling Staff to meet the complex needs of students, break down any barriers to learning, and create individualized programming (Government of Northwest Territories, 2016). Differentiated instruction and modified education programs are examples of suggested methods that can be used when implementing inclusive education (Government of Northwest Territories, 2016). Teaching staff is encouraged to work as a team with other professionals and to receive coaching and modeling from the School-based Support Team (Government of Northwest Territories, 2016). Professional development whether for new or more experienced teachers should connect prior knowledge with actual hands-on experience (Government of Northwest Territories, 2018).

Policy. In terms of how students diagnoses with ASD are taught in Northwest

Territories, there is no specific mention of ABA or other evidence-based strategies. In the

Northwest Territories there is no regulation board to certify BCBA. Even though training

is given to educators for behavioural support and FBAs (Government of Northwest

Territories, 2008). There is the use of some behavioural strategies such as observing

behaviours and determining how to create positive behaviours but there is no evident

insistence on intensive training in ABA. There are suggestions for educational assistants

to be certified but there is no standardized training available at the time (Government of

Northwest Territories, 2008).

Yukon

Program. Funding is provided to families with students with disabilities in

Yukon up to the age of 19 to access services (Yukon Health and Social Services, 2017).

Services offered that will benefit families with a child diagnosed with ASD include early

therapeutic interventions (IBI), respite, evidence-based specialized interventions for

severe behaviours and inclusion supports (Yukon Health and Social Services, 2017).

Policy. Within the school system, students with ASD receive an education that is

appropriate for their individual needs and adaptations are made in methodology,

programming, assessment techniques, or skill development (Yukon Department of

Education, 2015b). School-based personnel such as Learning Assistance Teacher

(supports and consults teacher through programming, assessments, etc.), educational

assistants or remedial tutor (implement programming) and Student-Support personnel

(provide professional development for individualized needs of students with ASD and

other disabilities) are a part of support staff to provide an inclusive learning environment (Yukon Department of Education, 2015a).

The Yukon does not have a regulation board to certify BCBA, though there is policy that supports ABA as early intervention and evidence-based interventions for severe behaviours. Within their education policy there is no mention of using ABA principles in teaching students with ASD and no specifics on how to provide differentiated support for the complex needs of students with ASD.

Nunavut

Program. Currently there is no specific therapy services for children with ASD in Nunavut (Autism Canada, 2017b) though Early Childhood Educators stress the need for training that is specific to ASD, practical, hands-on teaching techniques, one-to-one and sharing of personal experiences (Inuit Tapirit Kanatami, n.d.).

Policy. Within the school board there is a focus on inclusive education meant to encourage students to reach their individual potential (Nunavut Department of Education, 2018). A review conducted by Hall (2015) suggested improvements to Nunavut's inclusive education that included increasing the knowledge and skills of teaching staff through professional development, create clear expectations of staff roles as well as increase funding. Within Nunavut's inclusive education policy there is no specific mention of using ABA or other evidence-bases practices to teach students with ASD and in the territory there is no regulation board for to certify BCBA.

<div align="center">

United States of America

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The Individuals with Disabilities Education Act (IDEA, n.d.a) governs states all over the United States to ensure all students with disabilities are provided an appropriate

public education that caters to their special needs and provides necessary services. From birth to age 2 under IDEA Part Cm toddlers with disabilities can receive early intervention services and from ages 3 to 21 under IDEA Part B children with disabilities can receive needed services and special education (IDEA, 2018a). In IDEA there are also provisions to assist states, educational agencies, and other services to provide education to all students with disabilities by providing parents and educators the necessary resources to improve educational results (IDEA, 2018a). One resource provided to educators is Project AFIRM (Autism Focused Intervention Resources and Modules) where practitioners can complete step-by-step online modules to learn how to plan, monitor, and use evidence based interventions for children with ASD from birth to 22 years of age (IDEA, 2018b).

In the United States, 1 in 68 children are diagnosed with ASD and to meet their complex needs plus varying behaviours, educators are using ABA methods (AppliedBehaviourAnalysisEdu.org, 2019a). The Surgeon General in 1999 released a report stating ABA as an evidence-based practice treatment for individuals with ASD and even though it is not a mandated part of the IDEA, ABA has become a part of special education (AppliedBehaviourAnalysisEdu.org, 2019a). Some practices standardized to create an equal educational experience is an IEP, which can allow students to learn in the least restrictive environment; Functional Behavioural Assessments (FBA), which examine students' behaviour and environmental cues; and Behavioural Intervention Plan (BIP), which provides details on interventions for problem behaviour and how it can be replaced (AppliedBehaviourAnalysisEdu.org, 2019a).

BACB is a not for profit organization that provides certification and professional standards for those who want to work as a behaviour analyst providing ABA services (AppliedBehaviourAnalysisEdu.org, 2018a). To maintain certification, behaviour analysts must complete continuing education training; one example is Autism Focused Intervention Resources and Modules or AFIRM (2018), which can be completed via online training to receive credits. The National Professional Development Centre on Autism Spectrum Disorder (n.d.a) also provides training based on their own specific model of assessment, implementation, outcomes, and coaching throughout the training process. The U.S. Department of Education is funding a study that wants to increase teachers' use of evidence-based practices when working with students with ASD in elementary schools by providing teaching staff additional support and training (The National Professional Development Centre on Autism Spectrum Disorder, n.d.b). Another resource created by the National Autism Center (2019) that can be beneficial to educators is the Evidence-Based Practice and Autism in the Schools 2nd Edition. This manual provides the latest research findings, expresses values and preferences of families, as well as professional experiences to assist school professionals in engaging in evidence-based practices (National Autism Center, 2019). These are some examples of national efforts to improve the knowledge and skills of educators while there are separate initiatives within each state.

It should be noted that in the United States there are many private schools that specialize in using evidence-based practices to teach students with ASD (The Best Schools, 2019). Even though it can be a form of segregation from the general student population, some parents feel special education services in public schools are not enough

to meet their child's needs (The Best Schools, 2019). In some states government funding for education can be sent to private schools like in Massachusetts, to education students with ASD but for many parents they would have to spend their own money to send their child to private school (McLaughlin, 2017). Some private schools that provide education based in ABA are Applied Behaviour Consultants, California; Behaviour Analysis Center for Autism, Indiana; May Centre for Child Development Schools, Massachusetts; and Alpine Learning Group, New Jersey (The Best Schools, 2019). Such schools focus on providing intensive treatment and would have numerous specialist (BCBA, speech and language pathologist, occupational therapist, physicians, etc.) on staff but is not a realistic or accessible option for most families.

To examine how IDEA can be interpreted differently according to each state's interpretations, a select few states will be examined below for their BCBA certification requirements and their special education polices.

Utah

In 2015 in the state of Utah licencing to be a BCBA became optional through the Utah Psychologist Licensing Board (AppliedBehaviourAnalysisEdu.org, 2018b). Utah's government wants to create a health and education sector that is well qualified and will expand to meet the complex needs of individuals diagnosed with ASD (Kingsbury, 2017). Behaviour specialist teams would be given ongoing training to serve the entire state to evaluate and implement behaviour support plans (Kingsbury, 2017). Online training, services, and resources will be provided as well to rural and remote communities in Utah with a focus on evidence-based training strategies (Kingsbury, 2017).

Massachusetts

It is required since 2013 for a behaviour analyst to be certified to the state board (AppliedBehaviourAnalysisEdu.org, 2018b) and within the school system an ABA provider would need to be certified as an Applied Behaviour Analyst (ABA) with a paraprofessional being certified as an Assistant Applied Behaviour Analyst (AABA) (Massachusetts Advocates for Children, 2015; Massachusetts Government, 2015). The Augmentative and Alternative Communication Bill makes sure that teachers of students with disabilities are trained on appropriate use of augmentative and alternative communication technologies (Massachusetts Advocates for Children, 2018). The Autism Omnibus law allows for special education teachers to receive in-depth training on the complexities of need for their students with ASD (Massachusetts Advocates for Children, 2018).

New Jersey

Currently there is no regulation body within New Jersey to become a behaviour analyst but there are many advocating for the licensure and a licencing bill was recently introduced in the house and assembly (New Jersey Association for Behaviour Analysis, 2019). The lack of certification of behaviour analysts could be impacting the direction of special education within New Jersey. There are many professional development opportunities available such as training on how to place students with ASD in the least restrictive environment, transitioning students for life after graduation, developing IEPs, and providing high-quality services (State of New Jersey Department of Education, 2019). But there is no explicit mention of evidence-based interventions or using ABA methods when teaching students with ASD. It is expected that all members of the teaching staff be knowledgeable in ASD, create IEPs, and know how to create

individualized programming (New Jersey Department of Education, 2004). Professional

development in New Jersey must be presented by an expert in the field, be available on

an ongoing basis, and consultations must be available to the teaching team (New Jersey

Department of Education, 2004). As well, FBAs are used to manage challenging

behaviours (New Jersey Department of Education, 2004).

California

Behaviour Analysts in California who want to be certified must complete the

process through the BACB (AppliedBehaviourAnalysisEdu.org, 2018b). From birth to 22

years old, the state government provides special education to children with disabilities

(California Department of Education, 2019). The specially designed instruction can be

access at preschool, daycare and within the school system, so children with disabilities

can learn in the least restricted environment (California Department of Education, 2019).

Training is offered by the Department of Education to ensure educators are qualified to

work with students with disabilities (California Department of Education, 2019). Within

California's special education documents, there is no clear directive on how to teach

students with ASD while there are references to using a FBA to handle challenging

behaviours, creating an IEP (California Teachers Association, 2012) and other strategies

that are important. California not having a specific certification to become a behaviour

analyst could impact hiring standards for the school boards.

Montana

There are no specific regulations to Montana to be a behaviour analyst; the

certification by the BACB governs their practices (AppliedBehaviourAnalysisEdu.org,

2018b). Within their special education policy, there is no direct mention of ABA as a

teaching strategy (Office of Public Instruction, 2019) though methods such as specialized

instruction, creating an IEP, and conducting a FBA are mentioned and are all based on

ABA principles. There are professional development opportunities such as the free online

training from the OPI Montana Autism Education Project, which offers educators 84

hours of training (Montana Autism Education Project, 2019). The training covers

teaching procedures, specialized topics for educators in Montana, and behaviour

interventions (Montana Autism Education Project, 2019). In-person training is offered as

well on topics related to ASD which can be considered continuing education courses

(Office of Public Instruction, n.d.) but no specifics were provided if the training is more

knowledge based or experiential.

Table 1

Examination of Four Aspects of Experiential Learning Theory in Available Professional

Development

Province/territory/ state	Experiencing	Reflecting	Thinking	Acting
Ontario	Hours required of supervised experience in ABA	Feedback given if being supervised to complete 1 of 3 BACB certifications	Online learning through pilot project	N/A
Nova Scotia	N/A	N/A	Learning about how to support students with ASD in university and professional development	N/A
Manitoba	Help from St.Amant with school teams to work on social skills and challenging behaviours	N/A	Learning to program for complex needs	N/A
British Columbia	N/A	Consultations and support given to teaching staff to improve outcomes	POPARD training, online and in-person options	N/A
Alberta	N/A	Consultations by specialist on effective programming	Training offered on best practices and strategies	N/A
Saskatchewan	N/A	Possibility of consultations by the Special Education Unit	Training offered by Special Education Unit	N/A

New Brunswick	Training on PBSI that recommends practice	Training that includes feedback	Learning about PSBI, how to use direct observation to create a positive environment	The use of PBSI and training provided
Newfoundland and Labrador	N/A	N/A	Training offered to handle transitions	N/A
Prince Edward Island	Hours needed to be completed to become a BCBA	Feedback given throughout training in ABA	Need to complete university courses in ABA	Three years of direct experience with students with ASD with extensive training in ABA
Quebec	N/A	N/A	Training on the complex needs of students with ASD	N/A
Northwest Territories	Teaching staff working as a team receiving modeling from School-based Support Team	Coaching provided by School-based Support Team	Learn how to create individualized programming, how to break down barriers to learning	Connecting of previous knowledge to hands-on experience
Yukon	N/A	N/A	Support on how to create individualized programming based on needs of students	N/A
Nunavut	N/A	N/A	Focus on inclusive education	N/A
Utah	N/A	N/A	Behaviour specialist assist with behavioural support plans and online	N/A

			training available on evidence based strategies	
Massachusetts	Hands-on independent experiences with students with ASD	Feedback given from training in ABA	Certification in ABA and learning about complex needs of students with ASD	Hours need of hands-on experience to become a Applied Behaviour Analyst or Assistant Applied Behaviour Analyst
New Jersey	N/A	N/A	Knowledge on ASD and how to create individualized programs	N/A
California	N/A	N/A	Knowledge on IEPs, managing challenging behaviours and using a FBA	N/A
Montana	N/A	N/A	Online and in person training on teaching strategies and behaviour interventions	N/A

CHAPTER FIVE: SUMMARY, DISCUSSION, AND RECOMMENDATIONS

Autism Spectrum Disorder (ASD) is a lifelong neurodevelopmental disorder that affects the social communication and behaviour of those diagnosed (Mayer et al., 2014). In Canada the prevalence rates for children and youths diagnosed with ASD is 1 in 66 (Government of Canada, 2018). Depending on severity of a diagnosis of ASD, there can be difficulties with understanding social cues, maintaining eye contact, can lack empathy, have sensory sensitives, be rigid in behaviours, have delayed speech, and cannot engage in pretend play (Lindgren & Doobay, 2011). Applied Behavioural Analysis (ABA) is a lifelong evidence-based treatment for individuals with ASD that is focused on breaking down skills into smaller steps to be taught one at a time using positive reinforcement and prompting (Autism Canada, 2017a). Within the Ontario education system ABA has been an incorporated teaching method utilized for students with ASD. Despite this fact 72% of parents with children diagnosed with ASD surveyed by the Ontario Autism Coalition felt their children do not receive enough support in school and believed the teaching staff need more training (Nanowski, 2017).

From my own past experiences, I know the difficulties in working with students with ASD, when you do not feel fully prepared. Only through hands-on experience and feedback from a supervisor did my confidence increase. This is why I was interested when the Ontario Ministry of Education (2017) announced providing educational assistants in 18 school boards voluntary 40-hour online training based on the RBT competency exams. I wondered if online training should be the only option to teach educators about ASD and ABA, as well what was occurring in other areas. Especially when there are vigorous requirements that are not only based on factual knowledge but

also experiential to become a certified behaviour analyst or other related certification to practice ABA (Behaviour Analyst Certification Board [BACB], 2019). The purpose of the study is to examine how different professional development with different regions in Canada and select areas of the United States compares to best practices found in literature.

Summary of the Study

To find this out, I examined special education policy documents/reports that could be found online for the provinces and territories in Canada as well as select states within the United States. My attention was on teaching methods or strategies that relate to students with ASD. If there were no specifications of a separate ASD policy made, I examined available special education documents. As well, any professional development and which experiential training elements described in the examined documents were summarized in Table 1. Experiential Learning Theory explores how new knowledge is created through the cycle of experiencing, thinking, acting, and reflecting (Yeganeh & Kolb, 2009). I also analyzed if each state/province/territory had specific regulations to be a behaviour analyst, if the state follows qualifications from the BACB or if nothing is specified. Expectations for professionals and paraprofessionals could differ based on regional regulations.

With the Ontario Autism Program and recent clinical staffing requirements to work with individuals with ASD, there is a renewed emphasis on ABA has an evidence-based practice. The requirements for BCBA is rigorous but when it comes to front line ABA therapists there could have been a greater focus on requiring hands-on experience with children with ASD. There could be gaps in the delivery of ABA without having

supervision of an expert who can provide prompt corrective feedback. This can be the

same within the school system; educational assistants tend to have completed the same

education as ABA therapists. What tends to be lacking is the background knowledge in

ABA and the experience in teaching using ABA strategies. The professional development

offered in the pilot project is only voluntary and is only offered online. To truly master

ABA teaching strategies according to the BACB, 40 hours of experience delivering ABA

with the continuous supervision of a BCBA is needed to have a RBT certification, which

could be ideal for educational assistants or general teachers (BACB, 2019). For teachers

that specialize in special education or specifically students with ASD, 1,000 hours of

supervised training is suggested to have a BCaBA certification with the additional need

of continuous supervision from a BCBA (BACB, 2019). Students with ASD also need

individualized programing created by teachers that is consistent across settings and also

focuses on non-academic areas (e.g., daily living skills, behavioural supports, and social

skills; Corkum et al., 2014) and within the pilot project there was no mention of

additional training for teachers. There is always room for all educators who are involved

in the teaching team for students with ASD to receive more training in ABA.

The inclusion report conducted in Nova Scotia did not specify which types of

evidence-based practices should be incorporated into the school system. If ABA was the

chosen method suggested by the report, it would be easier to get all educators to have an

understanding of the best course of action. It would also create less confusion when

professional development needs to be created or when educational assistants want to

upgrade their credentials; there would be a concise path with ABA. In Manitoba, by

separating intensive ABA as something that is only available from separate agencies

outside the school system, it can allow for untrained educators to be tasked with applying ABA in schools. The scientific aspect of ABA that is focused on direct observation and measured modifications to improve behaviour can be lost by not explicitly saying ABA principles are involved with teaching students with ASD. It can decrease the need for specific hands-on professional development that trains educators in ABA.

The shift towards ABA in British Columbia will be beneficial to students but there is still not enough hands-on training with supervision by a BCBA expert to ensure the best results. When BC regulates the field of behaviour analysts there can be hope of greater dissemination about ABA, which can increase willingness of experiential training. In Alberta there is some funding from the provincial government allocated to public and private schools that specialize on ABA teaching strategies (Canadian National Autism Foundation, 2004). This allows for parents to have a choice in how their children are educated and can provide assurances that all educators working in these specialized schools have the required education and professional development to work with children diagnosed with ASD. It would be unfortunate for any parents if their child does not meet the needs requirement (Canadian National Autism Foundation, 2004) or if there is a cap for enrollment. The education policy in Saskatchewan utilizes PRT methods with consultation and professional development offered by the Special Education Unit, though it does not clarify the types of training is offered (Saskatchewan Education, 1999).

Across Atlantic Canada there is online training available for teaching staff and other professionals working with children diagnosed with ASD to explain knowledge on ASD and behavioural interventions (Government of New Brunswick, 2015). In New Brunswick the special education policy focuses on inclusive education with school-based

resources to ensure the teaching staff can create and implement effective teaching strategies (New Brunswick Department of Education and Early Childhood Development NB-DEECD], 2013). With an emphasis on Positive Behavioural Interventions and Supports (PBSI) and training is recommended to be provided with the practice/feedback model (NB-DEECD, 2017). ABA principles are used to create individualized programming for students with ASD in Newfoundland and Labrador and PRT is applied as an intervention during recess to encourage students to inclusively play together (Government of Newfoundland and Labrador, 2003). The Student Support Services Division provides professional development to meet the complex needs of students with ASD such as creating a plan for successful transitions within schools (Government of Newfoundland and Labrador, 2003). In Prince Edward Island it is clearly stated in the special education policy that behaviour analysts who want to work in the school board need to be qualified as an BCBA, have the necessary master's level education, courses in ABA, and hands-on experience working with children with ASD (PEI Department of Education, Early Learning and Culture, 2015).

In Quebec students are coded according to their learning disability, physical disability, and learning difficulty (Advisory Board on English Education, 2006) if a student is categorized under Pervasive Developmental Disorder individualized programing is created (Quebec Provincial Association of Teachers, 2017). The Centre on Excellence on Autism Spectrum Disorder provides consultation and training to teachers on the complex needs of the students they teach (Advisory Board on English Education, 2006). In the Northwest Territories, there is an inclusive education policy, though the needs of students with ASD are vast and at some point specific guidelines could decrease

any stress caused by trying to meet their learning needs. In the Yukon's education system students with ASD receive an education that is appropriate to their needs and necessary adaptations are made for teaching strategies and learning expectations (Yukon Department of Education, 2015). Hopefully in the future, Nunavut's education policy can include funding from the territorial government for ABA services for children with ASD and clearly defined ABA strategies for individualized learning within the school system.

In the United States the Individuals with Disabilities Education Act (IDEA, n.d.a) governs all states to ensure students with disabilities get an appropriate public education that provides the necessary services and is modified according to students individual needs. Utah's government wants to create an education and health system that has qualified professionals who can meet the needs of individuals with ASD (Kingsbury, 2017). Online training, resources, and services are provided to ensure those living in rural and remote communities have accessible evidence based training strategies (Kingsbury, 2017). In Massachusetts they have their own Board of Registration of Allied Mental Health and Human Services Professions and behaviour analysts/assistants must be licensed as an ABA (Applied Behavioural Analyst) or an AABA (Assistant Applied Behavioural Analyst; Massachusetts Advocates for Children, 2015). This allows students to have a quality education based in ABA and parents can be assured of the abilities of their children's educators.

In New Jersey professional development opportunities are provided by an expert in the field, consultations have to be available for the teaching team, and the training should be available on an ongoing basis (New Jersey Department of Education, 2004). As well the teaching staff is expected to be knowledgeable on ASD and know how to create

an IEP and individualized programming (New Jersey Department of Education, 2004). In California training is offered by the Department of Education to ensure educators are qualified to work with students with disabilities (California Department of Education, 2018). With California's special education policy there is mention of creating an IEP, using an FBA to manage challenging behaviours, and other teaching tools (California Teachers Association, 2012). Montana's education policy does not specifically mention ABA as teaching strategies but methods such as conducting a FBA, creating an IEP, and using specialized instruction (which are all based in ABA) are relied upon as strategies (Office of Public Instruction, 2019). Online training offered by OPI Montana Autism Education project is available to educators and covers behaviour interventions, teaching procedures and specialized topics (Montana Autism Education Project, 2019). There is also in-person training covering topics related to ASD and can be considered continuing education courses (Office of Public Instruction, n.d.).

Discussion

In Ontario there is a new regulation board that was put in place at the beginning of 2018, which requires clinical supervisors to have a BCBA certification with 3,000 hours plus other requirements, while frontline therapist are only required to have a police vulnerable check screening (Ontario Ministry of Children, Community and Social Services, 2018). The BCBA has other certification suitable for senior therapists (BCaBA) and ABA therapists (RBT) which also has specific education and hands-on experience expectations but the Ontario government made such qualifications optional. This could weaken the expectations for professionals working in schools, like educational assistants or other support staff. There needs to be a standard set for who can implement ABA

methods to ensure stories like Jack Skrt do not happen. According to the Ministry of

Education in Ontario, there have been investments in ABA required training for school

boards and for the Geneva Centre for Autism to provide 2,200 educators training (Ontario

Ministry of Education, 2019) but there also needs to be the hands-on experience

supervised by an expert who can give accurate feedback to create effective teaching

environments.

Even though Ontario's policies as with policies in other provinces can be

improved, in Nunavut there is no specific plan for early intervention or other services for

individuals with ASD (Autism Canada, 2017b). In the territories there is a focus on

providing an inclusive education which is beneficial but there must be specific techniques

to teach student with ASD and to manage any challenging behaviours. The American

states I examined as well did not mention ABA strategies specifically in their special

education documents. In the United States every state's special education policy is based

on IDEA and there is no mention of ABA in IDEA (AppliedBehaviourAnalysisEdu.org,

2019a). There is a greater focus on providing equality for all students and to create

individualized programming. In Canada, most provinces either named ABA as the

strategy used to teach students (e.g., DTT, prompting, positive reinforcement) with ASD

or specific ABA strategies were mentioned to manage severe behaviours (FBA, BIP).

Alberta and some states have private school options that can be funded with public

education money that offers specialized instruction using evidence based practices such

as ABA (The Best Schools, 2019; Canadian National Autism Foundation, 2004).

In terms of professional development each school board depends on principals

and other support professionals in Canada and the United States to determine what forms

of professional development occurs. Ontario is studying the results of the pilot project and if deemed successful it can be an option for professional development. Atlantic Canada has an online training called ASD and Behavioural Interventions: An Introduction for School Personnel, to teach educators more on ASD and evidence-based practices (Government of New Brunswick, 2015). British Columbia has an online resource called POPARD that educators are referred to where modules can be completed on learning more about ASD or an introduction to ABA (Provincial Outreach Program for Autism and Related Disorders, n.d.). Montana has multiple opportunities for educators to receive training online from the Montana Autism Education Project (2019) and in person training discussing topics related to ASD (Office of Public Instruction, n.d.). While on a national level AFIRM (2018) offers continuing education courses for educators online and the National Autism Center (2019) offers a free manual on ASD and evidence-based practices.

A form of professional development that is rarely mentioned within the numerous education documents analyzed concerns correctly conducting a Functional Behavioural Assessment (FBA). Within the IDEA the IEP team needs to create a behavioural improvement plan (BIP) and if the behaviour affects the student or other students performance, the BIP has to be based on a FBA (Mayer et al., 2014). A FBA is used to determine the function of a particular behaviour, to determine why a behaviour is repeated (Mayer et al., 2014). Within the school setting once the function of a behaviour is determined there can be strategies put in place to improve/change the inhibiting behaviours and is outlined in a BIP (Mayer et al., 2014). To ensure the best results for students it is recommended that experts such as behaviour analysts conduct FBAs and

BIPs (Mayer et al., 2014). FBAs are relied upon to find alternative behaviours to replace challenging behaviour but such an assessment should be made by experienced professionals. As well, teaching staff might not have the necessary training in data collection or hands-on experience that is supervised by an expert to ensure the assessment creates a positive outcome in future behaviours.

If ABA is going to be the teaching method for students with ASD having qualifications in ABA ensure that the best professionals are directly involved with the teaching team and can effectively create change in students' lives. For example in PEI's Education Handbook it states it is a Board Autism Consultant responsibility to guide FBAs to create behavioural plan (PEI Department of Education, Early Learning and Culture, 2015). Just as everyone knows a teacher is the expert in the classroom, when it comes to ABA someone who is qualified to be hired as a Board Autism Consultant in PEI will be the expert and should have input when ABA strategies are being applied into the classroom. In other regions such as Saskatchewan, New Brunswick, Newfoundland and Labrador, New Jersey, and California, FBAs are mentioned strategies within special education polices but it is not clear if there are possible professional development opportunities for educators to learn about the method, or if any professionals with qualifications with the BACB will be consulted or work alongside educators.

What I discovered from my research is that there is no consensus on the professional development needed for educators to work with students with ASD. Each province/territory/state has accepted the need for inclusive education with individualized programming but not all governments stress the need for evidence-based practices in schools. Even though parts of special education policy may incorporate ABA strategies,

there needs to be an agreement with all educators to apply evidence-based practices to instruction and curriculum creation for student with ASD (Loiacono & Palumbo, 2011). At times educational assistants can feel it is difficult to describe their role and do not feel prepared for the pedagogical aspects (Radford, Bosanquet, Webster, & Blatchford, 2015). Other times teachers can feel there is not enough support from educational assistants and other members of the teaching team (Corkum et al., 2014). While parents may feel that their children are not receiving the additional help they need in schools to succeed (Nanowski, 2017). The only way there can be a change is for all educators to master ABA principles and to be trained in applying the behaviour-analytic strategies to teach students with ASD in inclusive settings (Loiacono & Palumbo, 2011). Teachers and educational assistants need to be able to share information and resources to develop a relationship that can focus on teaching students with ASD without roles being threatened (Radford et al., 2015).

Recommendations

In terms of Experiential Learning Theory, with the current trend towards online education it can become difficult to capture all four points in the cycle of learning: experiencing, reflecting, thinking, and acting. Four regions' professional development that was analyzed had all four points as a part of experiential learning and had all three requirements for best practices in training educators: New Brunswick, Prince Edward Island, Northwest Territories, and Massachusetts. These areas did not just focus on the academics of learning about ABA or just hands-on training with ABA, there was the addition of reflecting, having coaching/feedback from an expert that improves the learning experience. The inclusion of hands-on experiences that allowed for the

application of ABA allows educators to put theory into action and to create a new teaching pedagogy. Once there is an opportunity to reflect on ways to improve one's teaching strategies, it is also important to have an opportunity of acting, putting new knowledge into action but still within the learning period to truly complete the experiential learning cycle. As well, the four previously mentioned regions allowed educators to learn more about how students with ASD are a heterozygous population and the importance of teaching with ASD strategies, which leads educators to believe in the positive effects of an evidence-based programming for students that is within an inclusive school environment (Corkum et al., 2014).

Through the research findings of Marder and deBettencourt (2012) the use of online only training was deemed not as effective. In instances when educators need to learn how to assess students' behaviours, collect behavioural data to be evaluated, and correctly apply feedback to students with ASD, the necessary skills can be difficult to acquire through an online format (Marder & deBettencourt, 2012).In Ontario, three out of the four points in the learning cycle are covered in the current online pilot project. The missing link is the portion of acting because the training is completed online, and there is limited opportunity to put new knowledge of ABA into practice. There is an assumption as well that in Ontario there will be opportunities for educators to be supervised by an expert with a qualification with the BACB to allow for reflecting to occur.

This research can be seen as a glimpse into what educators in schools are experiencing with teaching students with complex needs and to stress the need for more support as well as training. It is also an exposure to the principles of ABA and how much more training is needed to become an expert in the appropriate application of ABA. As

stated by Loiacono and Palumbo (2011), all educators should learn and be trained in

ABA to effectively teach students with ASD. There can be further examination to add

certification to educators who will apply ABA strategies with a hope to standardize the

experience of students with ASD. ABA is a growing field with numerous educational

programs and continuing education courses available that can increase the dissemination

of ABA as an evidence-based teaching strategy. More research can be done to determine

if educators feel qualified to apply ABA and if they would want more experiential

learning opportunities. Specifically for Ontario, I would suggest adding the requirement

for any professional working with children diagnosed with ASD to be certified by the

BACB according to their level of experience and schooling. If ABA is cited as the

approach used in Ontario, all professionals should be qualified, whether working in an

ABA centre or in the school system.

Final Words

Ontario held a provincial election in June 2018, and the change of government

brought about funding caps for the Ontario Autism Program depending on age. Within

the education system proposed changes include funding to extend the After School Skills

Development Program, subsidize teachers who want to acquire the Teaching Students

with Communication Needs (Autism Spectrum Disorder) additional qualification, and

doubling funding to the Geneva Centre to provide training for teachers and educational

assistants (Ontario Ministry of Education, 2019). For educational assistants training will

be specialized with the availability to complete the Registered Behavioural Technicians

course as well in the 2019-2020 school year the special education professional

development will have the topic of supporting students with ASD added to the list

(Ontario Ministry of Education, 2019). In addition in the 2020-2021 school year one half-

day session of professional development will be committed to learning how to support students with ASD and new teachers will have increased ABA training opportunities apart of the New Teacher Induction Program manual (Ontario Ministry of Education, 2019).

A new government comes with different ideas on how to improve the inclusive environment of students with ASD within classrooms but there is not enough detail to determine if the mentioned changes will currently please all stakeholders. Time will tell if the mentioned changes will be enough which could be further investigated at another time, especially with limited opportunity for experiential training experience for educators and no clearer expectations for how ABA would be implemented as a teaching strategy. It has been 12 years since the PPM 140 was implemented and there has been no specific revisions to the policy that can improve the education of students who need individualized programming and face different behavioural challenges. Everyone wants the best education for all students and students with ASD should not only get specialized instruction in private schools. Inclusion of students within mainstream schools has been embraced so the next step is to make sure all educators are receiving the appropriate training to succeed in a difficult job. Ontario's provincial government has invested in evidence-based practice of ABA to help individuals diagnosed with ABA; now I would hope there would be an investment in providing ABA training to all educators working with students with ASD. What is often forgotten is for all students the skills learned in elementary and high school are carried throughout life and this time can be utilized to teach important life skills with ABA as an evidence-based teaching method.

I hope I have added to the dissemination of knowledge concerning certification for educators in ABA and advocating for an increase in experiential learning within professional development.

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