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Jessica Delorey, *The University of Western Ontario*

Supervisor: Specht, Jacqueline A., *The University of Western Ontario*

A thesis submitted in partial fulfillment of the requirements for the Master of Arts degree in Education

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Abstract

The current study explored the experiences that influence beginning teachers' beliefs about teaching and learning in diverse classrooms. Teachers' beliefs inform their instructional practice, which in turn has direct bearing on their students' success. Interview data was collected as part of a larger study by the Canadian Research Centre on Inclusive Education. Fifteen pre-service teachers and 13 new teachers sorted the data using Trochim's (1989) group concept mapping method to identify themes. Pre-service teachers identified four distinct themes: (a) education, (b) practicum/collaboration, (c) work experience, and (d) personal experience with diversity. New teachers identified eight distinct themes: (a) education/training, (b) overall teaching experience, (c) classroom experience with exceptionalities, (d) learning from students, (e) teacher collaboration, (f) learning from personal experience, (g) organizations, and (h) other. These results underscore the importance of both professional and personal experiences and implicate teacher education programs and schools in the development process.

Keywords

beliefs, pre-service teachers, new teachers, diverse learners, inclusive education, teacher education.

Summary for Lay Audience

The present study was interested in understanding the experiences that influence beginning teachers' beliefs about teaching and learning in diverse (inclusive) classrooms. Beliefs serve as a lens through which we see the world, influencing the things we pay attention to and the way we behave. Teachers' beliefs directly influence the kinds of teaching practices they prefer. For students – especially those with diverse learning needs – this relationship between beliefs and practice can have direct bearing on achievement and outcomes. Interview data was collected as part of a larger study by the Canadian Research Centre on Inclusive Education. Fifteen pre-service teachers and 13 new teachers (within five years of a full-time contract) sorted the data using Trochim's (1989) group concept mapping method to identify themes. Pre-service teachers identified four distinct themes: (a) education, (b) practicum/collaboration, (c) work experience, and (d) personal experience with diversity. New teachers identified eight distinct themes: (a) education/training, (b) overall teaching experience, (c) classroom experience with exceptionalities, (d) learning from students, (e) teacher collaboration, (f) learning from personal experience, (g) organizations, and (h) other. These results underscore the importance of both professional and personal experiences and implicate teacher education programs and schools in the development process.

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Chapter 1

1 Introduction

In 1982, Canada amended their Charter of Rights and Freedoms to include that persons with disabilities, among other minorities, would receive equal protection and equal benefit of the law without discrimination (Government of Canada, 1982; Sokal & Katz, 2015). For children with disabilities and their families, this marked the beginning of a movement toward inclusive education. While there are many variations of what 'inclusive education' means, it can broadly be thought of as providing *all* students with access to an education alongside their peers in age-appropriate classrooms and in their neighbourhood school. In Canada, Ministries of Education operate at the provincial level, meaning that each of the ten provinces and three territories is responsible for creating their own educational curriculum and policy. Standards for inclusion vary across the country, despite each province and territory having legislature in place to enforce inclusive education (Sokal & Katz, 2015).

In Ontario, for example, an inclusive model of education is one in which "students see themselves reflected in their curriculum, their physical surroundings, and the broader environment, in which diversity is honoured and all individuals are respected" (Government of Ontario, 2014, p. 68). Special education classrooms are still a part of education in Ontario; however, placing students with exceptional learning needs in these classrooms can only be done after efforts have been made to include the student in general education classrooms (Government of Ontario, 2014, p. 10). In practice, these policies do very little to ensure that students with exceptionalities have access to an

education that is truly inclusive. Students with exceptional learning needs are grossly over-represented in the population of students being suspended or expelled from Ontario schools. In the 2016-2017 academic year, the Government of Ontario reported that nearly half of suspended (46.6%) and expelled (46.7%) students had an exceptionality (Government of Ontario, 2018).

In the province of New Brunswick, inclusive education is seen as a necessary means to developing a society in which diversity is valued and respected (Government of New Brunswick, 2013, p. 4). Unlike the province of Ontario, their policy for inclusive education explicitly states that there are to be no self-contained and segregated classrooms operating within schools or community-based learning environments (p. 6). Further, there are specific expectations for different stakeholders including classroom teachers, principals, and superintendents. For example, principals are expected to allocate resources in a manner that directly supports classroom teachers (e.g., through professional development opportunities and assigning support personnel) (Government of New Brunswick, 2013, p. 5).

Canadian provinces and territories are not just implementing inclusive education because the Charter of Rights and Freedoms stipulates they do so; there is also a significant amount of research in support of the academic and social-emotional benefits of inclusive education for all students (Demeris et al., 2007; Jordan, 2018b; Jordan et al., 2010). Students with disabilities who are educated in inclusive classrooms perform closer to grade level than peers in special education classrooms; however, accessing curriculum can be a challenge for these students (Fuchs et al., 2015; Gilmour et al., 2018). There is an important distinction to be made between providing *exposure* to general education

curriculum and providing *access* – simply placing students in an inclusive classroom does not guarantee access (Gilmour et al., 2018).

Additionally, the presence of students with disabilities in general education classrooms has been found to have no negative influence on the achievement of students without disabilities (Davis, 2015; Demeris et al., 2007). Davis (2015) followed 118 general education grade 6 students over a three-year period to determine the influence of inclusive education environments on mathematics achievement scores. Results from this study indicated that exposure to inclusive classrooms (both in years and in minutes per day) had no bearing on mathematics achievement for students in grade 6 (Davis, 2015). In fact, there is research to suggest that non-identified (i.e., students without exceptionalities) may actually benefit academically from the inclusion of their peers with exceptionalities (DiVita, 2019). One possible explanation for this is that when students with disabilities are placed in inclusive classrooms, teachers must diversify their instructional practice, making them more effective teachers for all of their students (Forlin, 2010; Jordan, 2018b; Jordan et al., 2010).

There is an expectation in Canada that teachers have the knowledge and skills to the teach in inclusive classrooms (Round et al., 2016), and thus that teacher education programs are providing future teachers with an opportunity to develop the necessary knowledge and skills (Tangen & Beutel, 2017). Through consultation with focus groups of various education stakeholders (e.g., superintendents, principals, general and special education teachers, educational assistants, etc.), Sokal (2012) identified four core competencies that are desirable for new teachers in inclusive classrooms. These are: (a) growth-seeking attitude, (b) effective communication, (c) inter-dependence (i.e.,

effectively working as part of a team), and (d) flexibility in the learning and teaching process.

1.1 The 3H Framework

Sharma (2011) outlines the 3H Framework for inclusive education, stipulating that for teachers to be successful in inclusive classrooms there must be harmony between their heart, head, and hands. In other words, teachers must believe in what they are doing, know how to do it, and feel confident doing it. Sharma (2018) further posits four key elements for preparing pre-service teachers with heart, head, and hands. First, pre-service teachers need to be co-taught by university academics and school educators. In doing so, faculties of education and school educators can present as a unified front, bridging the gaps between research and practice. This framework supports the work of Shulman (2000), emphasising that practicing teachers have more knowledge about teaching than any theory alone can provide.

Additionally, pre-service teachers should only be taught information that is evidence-based and in support of the inclusion philosophy. It is important – if not essential – for pre-service teachers to receive the message that inclusion is the foundation of strong education for *all* students, and not something that is extra and limited to certain students. Sharma (2018) also suggests that pre-service teachers should receive joint support from their professors and school educators during practicum experiences. Finally, pre-service teachers need to be assessed prior to their practicum to ensure they are ready to teach in inclusive classrooms. This assessment would be best if carried out collectively by the professor, school educator and the student. According to Sharma (2018), implementing

these four elements during teacher education will assist in preparing teachers with the heart, head, and hands of inclusive educators.

What exactly does an inclusive ensemble of heart, head and hands look like? The following sections will explore literature surrounding teachers' beliefs, instructional practices, and self-efficacy as they relate to inclusive education.

1.2 The Heart (Beliefs)

Our beliefs can be thought of as a lens through which we view the world. As such, beliefs influence the things we pay attention to, the ways in which we process and interpret information, and the ways in which we act (Fives & Buehl, 2012). Teachers' beliefs – about the nature of teaching and learning, ability and disability, among other things – directly influence their instructional practices, which in turn influence student outcomes (Fives & Buehl, 2012; Jordan, 2018b). This relationship between beliefs, practice and outcomes is particularly important for diverse learners.

According to Jordan (2018b), teachers' beliefs about disability exist on a spectrum that ranges from pathognomonic (meaning the belief that disability is inherent in the individual), to interventionist (meaning the belief that it is the teacher's responsibility to create access to the curriculum for students with disabilities). A teacher with pathognomonic beliefs about disability will attribute failure to the student and their disability. On the other hand, a teacher whose beliefs align more with the interventionist perspective will be more likely to engage in a variety of teaching styles and more willing to accommodate individual learners' differences (Jordan, 2018b), making them a more effective teacher for *all* of their students (Jordan, 2018a). For many teachers, their beliefs

cannot be neatly categorized as purely pathognomonic or interventionist. People who fall somewhere in the middle of the spectrum tend to believe that it is their responsibility to teach to the ability of all students, however they do not feel adequately prepared to do so (Jordan, 2018b).

While it is important to understand how teachers may conceptualize disability, beliefs about the nature of ability more generally are also important. The Beliefs about Learning and Teaching Questionnaire (BLTQ) measures beliefs about ability on a scale ranging from incremental (meaning ability is fluid and can develop over time) to entity (meaning ability is a fixed trait) (Glenn, 2018). Teachers who subscribe to the entity perspective tend to have lower scores on the pathognomonic-interventionist (P-I) scale, meaning they believe that educating students with disabilities falls outside of their responsibilities. Teachers who hold beliefs that are based in the incremental perspective of ability tend to score higher on the P-I scale, meaning they believe it is their responsibility to meet the learning needs of all students (Glenn, 2018; Lanterman & Applequist, 2018).

The structure of a teacher's belief system as it relates to ability and disability directly informs their preferred teaching practices (Jordan et al., 2010; Jordan & Stanovich, 2004). Teachers whose beliefs are categorized as more pathognomonic and entity based spend less time engaging their students in academic discourse and more time managing behaviour. They also interact less with their students who are at risk of failing compared to their students who are typically achieving. On the other hand, teachers whose beliefs are categorized as interventionist and incremental based engage in more academic talk with all their students, facilitate small group dialogue, and interact with struggling students almost twice as much as with their other students (Jordan & Stanovich, 2004).

By understanding the different beliefs about disability and ability we can begin to paint a picture of an ideal teacher – the teacher we would want for ourselves, our children, and our communities as a whole.

We know that beliefs are deeply entrenched within individuals, making them very difficult to change and nearly impossible to be taught (Sharma, 2018). That being said, we also know that beliefs are malleable and capable of being shaped or modified (Lanterman & Applequist, 2018; Sharma, 2018). In a study by Lanterman and Applequist (2018), pre-service teachers were randomly assigned to receive one of two interventions using Universal Design for Learning (UDL). In one condition participants completed a module that was delivered from the perspective that UDL is a tool that can be used to meet the needs of *all* learners, while the other group participated in a module that was delivered from the perspective that UDL is a tool intended to meet the needs of students with disabilities. Both of these modules prompted a shift in beliefs toward the interventionist perspective of teaching, learning, and disability.

Two teacher educators at St. Francis Xavier University documented their experience with reconceptualizing a course on inclusive education using a disability studies perspective (Gilham & Tompkins, 2016). While beliefs were not explicitly measured as part of this report, pre-service teachers offered comments that suggest the course had a significant impact on their understanding of disability and inclusion, further supporting the notion that beliefs are malleable. One student commented they "learned … how to look at disability in a completely different way" (p. 17), while another indicated that "this class allowed me to understand my own lived experience and prior knowledge of inclusion, and change my idea of the term [inclusion]" (p. 17). While these examples illustrate that

coursework and modules on inclusive education have merit, these experiences on their own may not be enough to have a lasting impact on beliefs or to inform instructional practices. Jordan and colleagues (2009) suggest that practicum experiences are likely a more important piece of this puzzle. Pre-service teachers especially need to see effective inclusive practices being modeled through their practicum experiences (Tangen & Beutel, 2017) and additionally need opportunities to implement the skills and strategies they have learned (Specht et al., 2016).

1.3 The Head (Instructional Practices)

While beliefs are the strongest predictor of teaching practice (Jordan et al., 2009), beliefs on their own are not sufficient when it comes to implementation. In order for inclusion to be successful, teachers must have knowledge of instructional practices and approaches that are likely to be effective for their students with exceptionalities. McLeskey et al. (2018) highlight many examples of "high-leverage" practices for inclusion, such as: identifying and prioritizing learning goals; designing instruction toward specific learning goals; providing scaffolding supports; using explicit instruction; and using assistive and instructional technologies. In order to successfully implement these practices, teachers must be flexible problem solvers, capable of monitoring the effectiveness of their instruction to make adjustments based on individual learners. Further, Cooper et al. (2008) suggest that teachers also need knowledge of children with disabilities, methods of formal and informal assessment, and classroom management and behavioural interventions. When teachers feel ill-equipped to manage classroom behaviours their energy and efforts are diverted from providing high quality instruction (Ortúzar, 2019).

Much of the challenge with instruction lies within translating what we know from research into practice. This is partly attributed to shortcomings in the way that teacher education programs are currently designed (McLeskey et al., 2018). Coursework often focuses on the theory behind instructional practices with little emphasis on how to effectively implement these practices. This model operates on the assumption that pre-service teachers will acquire these skills during their practicum experiences (McLeskey, et al., 2018); however, there is often a disconnect between what is being taught through coursework and what is being modelled during practicum experiences (Essex et al., 2019).

Florian (2019) highlights the concern that the 'inclusion' we see in practice today still follows the special education model, only with a new name. This contradiction may offer an opportunity for pre-service teachers to reflect on their own practice, with the goal of becoming the best possible teachers (Tangen & Beutel, 2017); however, pre-service teachers are often reluctant to challenge what is already being done in the school systems and may come to adopt practices that are not conducive of effective inclusive education (Essex et al. , 2019). Thus, there is a need for pre-service teachers to see effective inclusive practices being modelled throughout their practicum experiences (Tangen & Beutel, 2017).

1.4 The Hands (Efficacy)

In addition to having a strong grasp of instructional practices, new teachers also need to feel confident in their own ability to successfully implement these practices. Gibson and Dembo (1984) highlight two distinct components of efficacy for teachers. First is *teaching efficacy*. This is essentially the belief that your actions will result in the desired

outcomes. In other words - when you teach your students will learn. The second dimension is *personal teaching efficacy*. This is in line with Bandura's theory of self-efficacy (Bandura, 1977), and refers to your belief that you as a teacher possess the skills and abilities necessary to produce a desired outcome. Whether conscious or not, we make ongoing evaluations of our own abilities to successfully execute specific tasks. For teachers, the ability to teach in inclusive classrooms and meet the needs of their students is among the list of appraisals.

Having a strong sense of efficacy is related to many positive outcomes. People with higher self-efficacy will persevere on challenging tasks longer and remain more optimistic, while low self-efficacy can lead to stress and apathy (Bandura, 1990). Young and colleagues (2018) asked pre-service teachers to recall experiences in their practicums where they felt challenged in meeting the needs of a student with an exceptionality. Participants recounted stories with common themes of behaviour management, academics, relationships with students and with other adults within the school. Interestingly, not all challenging situations were associated with negative outcomes and similar situations were construed very differently by different participants (Young et al., 2018). One possible explanation for these results could be that those who perceived challenging experiences as more positive have a stronger sense of efficacy.

According to Bandura's (1990) theory, efficacy is not a fixed trait and can be strengthened and developed over time. Working toward mastery of a skill is the most effective way to increase efficacy and this can be done through practice and repetition. It is imperative that teacher candidates have the opportunity to repeatedly practice the skills they are learning in their teacher education programs – including the skills related to

inclusive practices. Teacher education programs play a critical role in this development. Mintz (2019) was interested in understanding the impact of enriched instruction on inclusion during teacher education programs as well as during new teachers' first year in the profession. He found that enriched instruction on inclusion during teacher education programs increased self-efficacy for pre-service teachers. Additionally, higher levels of self-efficacy were maintained into the first year of teaching for these teachers. On the other hand, receiving instruction on inclusion during the first year of teaching did not produce any changes in self-efficacy. When we evaluate our own ability to execute a task, we rely heavily on what we already know (Bandura, 1990). Therefore, it is imperative for pre-service teachers to see inclusion in action – and, more importantly, to see *effective* inclusion in action (Loreman et al., 2013).

1.5 Teacher Development

In order to prepare teachers with the heart, head, and hands of inclusive educators, we must understand the ways in which they acquire new information to inform their beliefs, instructional practices, and self-efficacy. Desimone (2009) developed a framework for teachers' professional development with the premise that participating in professional development allows teachers to gain new knowledge and skills and/or experience a change in attitudes and beliefs. The new knowledge and beliefs will then influence their instructional practice, which will in turn lead to improved outcomes for students. That said, all professional development is not equal. Effective professional development should: (a) be content focused, (b) actively engage teachers, (c) encourage collaboration, (d) be of a sufficient duration to produce change, and (e) be consistent with school policies (Desimone, 2009). This framework emphasizes the role of formal professional

development; however, Buehl and Fives (2009) suggest that professional development also occurs as a result of many informal experiences, such as observational learning, lived experiences, and self-reflection.

The specific ways that teachers acquire new information can vary depending on their level of experience. At the pre-service level, for example, practicum experiences and pedagogy learned through coursework (Harvey et al., 2008), as well as discussions with peers have all been found to be important sources of information (Tannehill & MacPhail, 2012). Further, pre-service teachers prefer information that comes directly from sources of authority (e.g., from university professors and mentor teachers). Practicing teachers, on the other hand, are more likely to rely on their own teaching experience (Buehl & Fives, 2009). Meirink et al. (2009) identified three main categories that describe the ways practicing teachers gather information: (a) colleague-based learning, (b) individual-based learning, and (c) becoming aware of one's own learning process. Colleague-based learning was primarily concerned with observing others' teaching practices and occasionally involved explicitly seeking direction and advice from colleagues. Individual-based learning involved critically reflecting on teaching practices and experimenting with alternative ideas and methods. In the third category – becoming aware of one's own learning process – participants use their own experiences to relate to their students and inform their ideas and practices.

When it comes to learning new information specifically about inclusion and the education of students with exceptionalities, Servais (2012) also found that teachers' level of experience made a difference in the ways they sought out new information. Novice teachers prefer to seek information form knowledgeable experts and colleagues and shy

away from sources like websites, journals, books, magazines and electronic media. Additionally, novice teachers reported that more experienced colleagues were helpful when trying to identify their specific needs. More experienced teachers are generally more efficient at finding the information they need and feel more comfortable turning to sources like websites, journals and books. All practicing teachers, regardless of their years of experience, wanted information that was evidence-based, from a credible source, accessible, and easy to read (Servais, 2012).

All teachers need to have access to information that will help them meet their students' needs. When new teachers feel as though they do not have the skills necessary to do this, they may experience what is known as 'praxis shock' (Ballantyne, 2007). This can be a very overwhelming experience for beginning teachers and can lead to stress, fatigue, and burnout (Kutsyuruba et al., 2014; McCrimmon, 2015). Providing beginning teachers with a strong foundation for inclusive education early on has the potential to minimize the effects of praxis shock. This could have lasting impacts on their careers (Mintz, 2019), allowing both teachers and students to succeed in inclusive classrooms. Unfortunately, many beginning teachers feel that they do not have the training they need to be able to effectively meet the needs of diverse learners in inclusive settings (Essex, et al., 2019; Loreman, 2007; McCrimmon, 2015; McLeskey, et al., 2018).

1.6 The Present Study

The current study was situated as part of a larger project – broadly referred to as the Beginning Teachers Study – by the Canadian Research Centre on Inclusive Education. The Beginning Teachers Study incorporates both quantitative and qualitative measures to investigate the development of self-efficacy, beliefs, and instructional practices of

beginning teachers. The research team followed pre-service teachers through their education programs and into the early years of their careers as practicing teachers. Survey measures (including the Teacher Efficacy for Inclusive Practice (TEIP) scale and the Beliefs about Learning and Teaching Questionnaire (BLTQ)) and semi-structured interviews were conducted on an annual basis for three years.

This research was exploratory in nature and used interview data from the Beginning Teachers Study to investigate the experiences that influence pre-service and new teachers' beliefs about teaching and learning in inclusive classrooms. Additionally, group concept mapping (Trochim, 1989) – explained in detail in the Method section – was employed to identify conceptual themes within the data and compare and contrast the results for pre-service and new teachers.

The purpose of the current study was to understand the experiences that help beginning teachers develop a strong foundation for inclusive education. Specifically, we sought to understand the experiences that inform beginning teachers' beliefs about how students learn in diverse (inclusive) classrooms. Studying the development of teachers' beliefs is a necessary first step in gaining a greater understanding of the overall development of inclusive practices for teachers (Jordan et al., 2010; Jordan & Stanovich, 2004). A subsequent aim of this study was to compare and contrast the development of beliefs for pre-service and new teachers (within the first five years of a permanent position). We know from the reviewed literature that pre-service and new teachers acquire information in different ways (Buehl & Fives, 2009; Meirink et al., 2009; Servais, 2012; Tannehill & MacPhail, 2012) and thus it is important to understand these differences in the specific context of inclusive education and diverse learners. In doing so, we make

recommendations as to how teacher education can assist in developing and supporting beliefs that are essential for teachers to support the learning needs of all students.

Chapter 2

2 Method

2.1 Participants

Participants were recruited through a faculty of education in a Southwestern Ontario university, as well as through a New Teacher Induction Program (NTIP) and though social media channels. Participants had to be in the final year of their Bachelor of Education program (pre-service) or within the first five years of a fulltime contract (new teacher) to be included in this study. Our participants had the option to complete this study in-person or online. Each method has unique strengths and challenges; however, there are no meaningful differences in the reliability and validity of the results generated by in-person and online participation (Rosas & Kane, 2011).

2.1.1 Pre-service Teachers

Fifteen pre-service teachers (13 women and two men) completed the sorting activity (all in person). The pre-service teachers represented a diverse sample and self-reported as East Asian (20%), Latin American (6.67%), Aboriginal-White (6.67%), Black-White (6.67%), White (40%), and “other” (20%). The oldest participant was 31 years old and the youngest was 23 years old (M = 24.53 years, SD = 2.29 years). See Table 1 for a summary of the grades that participants were preparing to teach.

Table 1. *Grades Participants were Preparing to Teach*

Grades	Frequency (%)
K-3	7 (18.42)
4-6	8 (21.05)
7-8	8 (21.05)
9-10	8 (21.05)
11-12	7 (18.42)

Note. Most participants selected more than one choice.

2.1.2 New Teachers

Sixteen new teachers (10 men and six women) completed the sorting activity (three in person, 13 online). The ethnicity of this sample was homogeneous, with all 16 participants identifying as White. The oldest participant was 37 years old and the youngest was 24 (M = 27.44 years, SD = 3.85 years). Teaching experience ranged from one to eight years; however, all teachers were within the first five years of a permanent contract (M = 2.78 years, SD = 2.27 years). Refer to Table 2 for a summary of the grades participants were teaching at the time of the study. Sorting data from three participants was not included in the analysis due to improper sorting techniques, which are described in more detail below. Sample size for both our pre-service and new teachers (15 and 13, respectively) exceed the minimum number of participants (i.e., 10) outlined by Kane and Trochim (2007).

Table 2. *Grades Participants Taught at the Time of the Study*

Grades	Frequency (%)
K-3	5 (17.86)
4-6	6 (21.43)
7-8	3 (10.71)
9-10	8 (28.57)
11-12	6 (21.43)

Note. Most participants selected more than one choice.

2.2 Procedure

Trochim's (1989) group concept mapping approach was used to analyze the interview data. Concept mapping creates a visual conceptualization of the ideas generated through the interview process (Kane & Trochim, 2007). Participants play a central role in the analysis by defining the concepts and determining concept groupings based on similarity – setting concept mapping apart from other methodologies.

Trochim (1989) identified six steps in the concept mapping process: (1) identify participants and research questions; (2) transcribe participants' interviews, remove redundant statements and record unique statements; (3) return the unique statements to participants. Each participant reviews all of the unique statements and sorts them into groups based on what is logical to them; (4) apply statistical analyses to the participants' groupings of statements and decide the optimal number of concepts; (5) label the concepts after reviewing labels provided by the participants; (6) create a computer-

generated map identifying the relationships amongst ideas within a given thematic cluster and show the position of each cluster within the overall structure.

2.2.1 Statement Generation

Seventy-four interviews were conducted with Canadian beginning teachers (36 year two pre-service teachers; 38 newly graduated teachers) as part of a larger study by the Canadian Research Centre on Inclusive Education. The semi-structured interviews asked participants about the experiences that have contributed to their beliefs in how children learn in diverse classrooms. The interviews were transcribed and the statements for the present study were generated based on participants' responses.

2.2.2 Statement Preparation

The list of statements was simplified by removing redundant responses. When two or more statements reflected the same sentiment but used slightly different language the researchers kept the statement that used the clearest and most easily understood language. For example, the statements "my own experiences growing up" and "definitely the way I was brought up" are redundant with the statement "I grew up in a home where diversity was accepted". The latter statement provides the reader with more context than the two former and thus was included for sorting. All unique statements were then assigned an arbitrary number in preparation for the sorting portion of the procedure. The statement preparation process resulted in 79 unique statements for the pre-service teachers and 96 unique statements for the new teachers. In a pooled analysis of 69 concept mapping studies, Rosas and Kane (2011) determined that on average 96.32 (SD = 17.23) statements were used in the sorting procedure. The number of statements used with both

the pre-service and new teachers represent an appropriate breadth of ideas and a manageable workload for participants (Kane & Trochim, 2007; Rosas & Kane, 2011).

2.2.3 Statement Sorting

The current study process began with this step. Participants received the unique statements (either in person using strips of paper or online using the Concept Systems® Group Wisdom™ (2019) program) for the sorting task. Participants were instructed to organize the statements into distinct groups, and to provide a label for each grouping. While there are no right or wrong answers in the concept mapping process, the groups must be based on content of the statements as opposed to the participants' subjective experience with each statement. For example, participants were asked not to provide groups such as "things I agree with", "things I have experienced", "not applicable to me", etc. In order to generate meaningful results participants were asked not to place all statements into a single pile. Additionally, each statement could not represent its own group (although some can) (Kane & Trochim, 2007). The sorting was repeated separately for each round of interviews. In other words, the statements that were collected from pre-service teachers were sorted by other pre-service teachers, and the statements that were collected from new teachers were sorted by other new teachers.

Chapter 3

3 Results

3.1 Pre-service Teachers

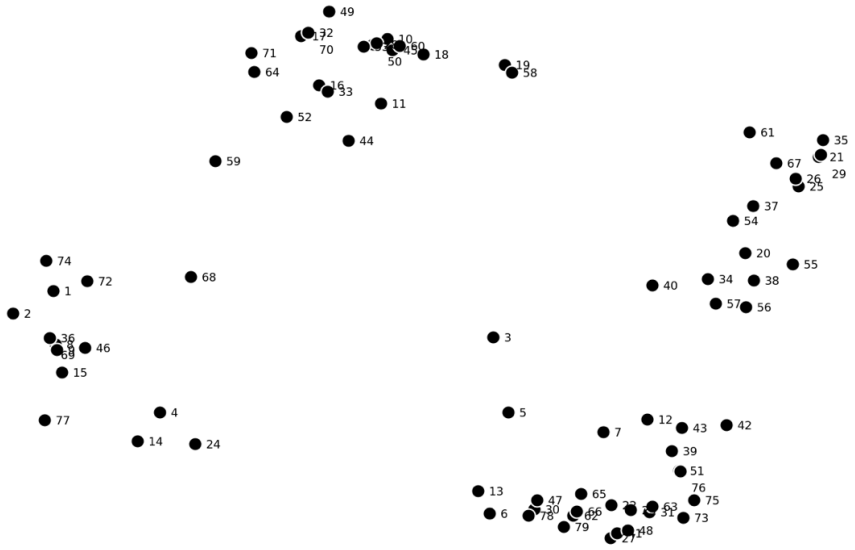
3.1.1 Multidimensional Scaling: Data Point Map

The first step in the data analysis process of concept mapping was to input all of the data that was generated in person into the Concept Systems® Group Wisdom™ (2019) program. The software creates a binary matrix for each participant, where there are as many rows and columns as there are statements (Dare & Nowicki, 2015). Each cell in the matrix was assigned a value of either "1" or "0", where a "1" meant the two statements were sorted together and a "0" meant they were not. Participants' individual matrices were then combined to generate one similarity matrix. This process was done separately for the data generated from pre-service and new teachers.

From here, we used multidimensional scaling to analyze the similarity matrices. This analysis allowed us to determine the proximity of the statements to one another on a two-dimensional coordinate grid – also known as the data point map (see Figure 1). Statements that are close together on the map are more conceptually related and were frequently sorted together (Kane & Trochim, 2007). For example, in Figure 1, statements 19, "Professional development about restorative justice" and 58, "Professional development day about mental health" are close together on the map because 14 out of 15 participants sorted them together. Statements that are father apart are less conceptually related and were sorted together less often (Kane & Trochim, 2007). For example, statement 2, "My own learning style" and statement 61, "Observing the practices of other teachers" are located farther apart because none of the 15 participants sorted these

statements together. Kruskal's stress value was used to determine the fit between the way participants sorted the data and the resulting point map. Stress values range from 0 to 1, where a lower value indicates less stress on the model and a better fit. Kane and Trochim (2007) suggest that stress values between 0.205 and 0.365 are acceptable for concept mapping analyses. Rosas and Kane (2011) found the mean stress value in concept mapping studies to be 0.280, ranging from 0.170-0.340. The stress value of the pre-service teacher point map was 0.186, which falls within the range reported by Rosas and Kane (2011) and indicates the model is a good fit for the data.

Figure 1. *Pre-service Teacher Point Map*



3.1.2 Hierarchical Cluster Analysis: Cluster Map

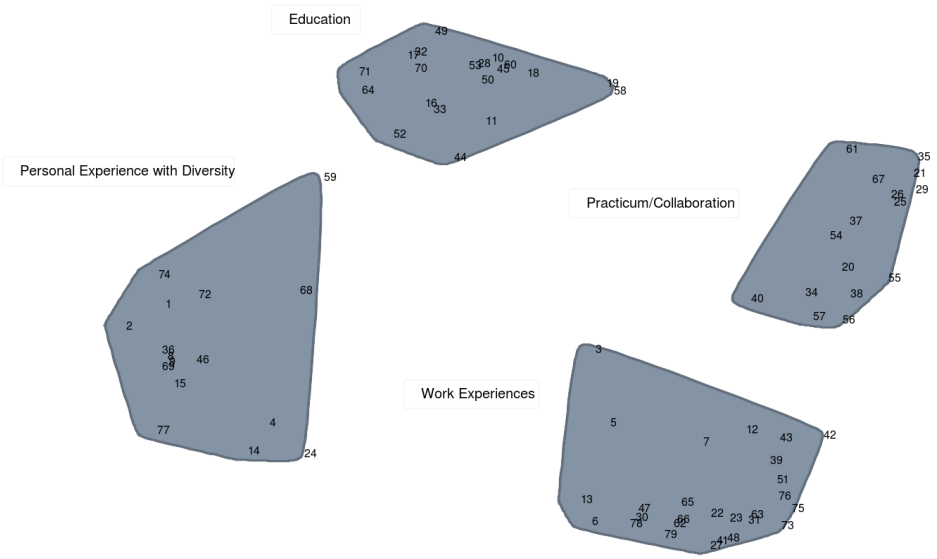
Next, hierarchical cluster analysis was used to group the individual data points (i.e., statements) into clusters. Each cluster represents statements that were commonly grouped together by the participants and that are conceptually similar. We generated multiple

maps with different numbers of concepts. To determine the best-suited map, we considered statistical bridging indices. Each statement has a bridging value that numerically represents how it was sorted with statements in the same vicinity on the map. Values range from “0” to “1”, where a bridging value close to 1 indicates that the statement was less consistently sorted with the statements around it, and therefore “bridges” the different themes on the map. A bridging value close to 0 indicates a statement was very consistently sorted with the statements around it and therefore acts as an “anchor” for the given theme. Each cluster on the map is also assigned a bridging value which represents the average of the bridging values for the statements within the cluster (Kane & Trochim, 2007).

We considered maps ranging from three to eight clusters to determine the best fitting model for the data. With each iteration we considered the bridging value of the clusters and the emerging themes. When too many clusters are included, bridging values can be high and the statements in separate clusters can be closely related. Bridging values can also be high when a map does not have enough clusters and statements within each cluster can be quite unrelated to each other. Starting with a high number of clusters (eight in this case), we examine changes in the groupings as the number of clusters gets smaller. For example, when moving from six to five clusters, the groupings “other jobs” (bridging value = 0.37) and “work outside the classroom” (bridging value = 0.13) merge to become “work experiences” (bridging value = 0.21). Merging these clusters makes sense because the statements within the two original groups are similar and the resulting bridging value of the new group is low. By making a series of decisions like the one above, we determined that the four-cluster map (Figure 2) best represented the pre-service sorting

data. Clusters ranged from 16 to 27 statements and had average bridging values that ranged from 0.25 to 0.54. Refer to Table 3 for a breakdown of the statements in each cluster as well as their bridging values.

Figure 2. *Pre-service Teacher Cluster Map*



The program suggests labels for the clusters based on the labels used by participants who sorted the statements most similarly to the resulting cluster; however, to ensure the labels accurately reflect the content of each cluster we carefully considered the statements within each cluster, the suggested labels provided by all participants, and our own understanding of the concepts (Kane & Trochim, 2007). As a result, it was decided that two of the four cluster labels would remain as the program suggested. These labels were "education" and "work experiences". The suggested label for the third and fourth clusters ("personal exposure to disability" and "practicum/collaborative learning") were changed to "personal experience with diversity" and "practicum/collaboration" to better reflect the statements within the group.

Table 3. *Pre-service Teacher Breakdown of Statements by Clusters*

Statement	Bridging Value
Cluster 1: Personal Experience with Diversity	**0.54**
36. I was identified as gifted in elementary and secondary school	0.28
69. I have a learning disability	0.28
2. My own learning style	0.29
8. My own experiences growing up and learning	0.30
9. My personal struggles as a student in school	0.32
46. Being a gifted student in a "pull-out" program	0.45
15. Raising my own kids	0.47
74. Values I learned through my parents and family	0.48
77. My step son's experiences in school	0.52
72. My religious beliefs	0.59
14. My cousin has learning disabilities	0.69
1. My own teachers that I had in my childhood	0.72
4. Exposure to success of adults with special needs when I was a child	0.74
59. Attending a summer institute	0.79
24. I have a cousin who has severe Cerebral Palsy who succeeded in the educational setting	0.79
68. Observations of the people around me	1.00
Cluster 2: Education	**0.25**
70. Courses in Philosophy that I have taken	0.04
32. The Psychology courses that I have taken	0.04

Table 3 (continued)

Statement	Bridging Value
17. The course work in my other degrees	0.04
49. Stuart Shanker's work on Zones of Regulation	0.07
53. Course work	0.08
28. My classes in the faculty of education	0.08
50. Course work in Special Education in the faculty of education	0.08
60. A video watched in faculty of education class	0.16
10. Different readings on theories of education	0.18
45. English language learning course	0.18
71. My understanding of Maslow's basic principles	0.22
18. We talked about inclusion in my education courses	0.24
64. I have an engineering degree	0.25
16. Learning about adaptive physical experiences	0.29
11. My experiences at the faculty of education	0.40
52. Media exposure including articles, videos, and on-line information	0.48
19. Professional development about restorative justice	0.49
33. A professor in the faculty of education	0.53
58. Professional Development day about mental health	0.54
44. My background in special education	0.56
Cluster 3: Work Experiences	**0.21**
63. Teaching marine sciences to students who came on field trips	0.00
31. Work at the Ministry of Justice with young offenders	0.00
23. Working with a therapeutic riding program	0.00

Table 3 (continued)

Statement	Bridging Value
22. As a swimming instructor I integrate kids into the regular swimming classes	0.04
73. Youth group work through the church	0.04
48. Volunteer experience in a youth custody center	0.04
75. Experience from working in a Northern Community school	0.06
66. Working at science outreach summer camp with students with a wide range of abilities and knowledge	0.07
41. Volunteering	0.08
62. Working at a summer camp for kids with disabilities	0.08
27. My volunteer experience in a European country	0.10
51. Working as an educational assistant	0.12
65. I was a nanny	0.14
30. Working with a girl with Autism at a day care	0.17
47. Experience as a youth support worker	0.21
78. Working with exceptional children in a behavioural program	0.21
76. Work experiences	0.22
39. Teaching abroad	0.26
79. Working with second language learners	0.27
7. Working with a mom who has a son in an ASD-specific class	0.31
12. Working with diverse learners in a one-on-one setting	0.32
6. Coaching one boy who has Autism in a general skating program	0.33
42. Supply teaching	0.35
43. Practical experiences in the community	0.39

Table 3 (continued)

Statement	Bridging Value
13. A student who was a select mute in one of the classes I volunteered in	0.45
5. A couple of students that I've had that have been exceptional	0.54
3. Seeing the success of learning centers	0.77
Cluster 4: Practicum/Collaboration	**0.46**
21. My associate teacher	0.30
29. Conversations with my associate teacher on practicum placement	0.30
35. Talking with the principal during practicum experiences	0.35
26. An associate teacher on practicum that emphasized inclusivity in the classroom	0.35
25. Seeing inclusivity modelled during practicum	0.37
67. Attitude of associate teacher in practicum placement	0.40
55. Working with the Indigenous Worker during a practicum placement	0.47
37. Practicum with students with IEPs (Individual Education Plans)	0.48
20. Practicum experiences	0.49
38. A student with Autism during a practicum	0.50
56. Working with a gifted student during practicum placement	0.51
61. Observing the practices of other teachers	0.53
54. Observing students	0.53
34. Experience with the kids in the classroom	0.58
57. Working with team leaders who develop IEPs (Individual Education Plans)	0.60
40. Working with parents	0.65

3.1.2.1 Personal Experience with Diversity

The personal experience with diversity cluster had the highest overall bridging value, meaning that as a group these statements were sorted with the least amount of consistency. The statements in this group generally reflected firsthand and familial experiences with diversity. Most of the statements refer to experiences with exceptionalities and there is also a reference to experiencing diversity through religion. The statements "I was identified as gifted in elementary and secondary school" and "I have a learning disability" had the lowest bridging value (0.28), which tells us that these statements reflect the core ideas of the cluster. The statement "Observations of the people around me" had the highest bridging value (1.00) in the group, telling us that this statement connects the ideas in this concept with the other concepts on the map.

3.1.2.2 Education

The statements in the education cluster tended to reflect experiences within the faculty of education as well as experiences from previous degrees. The statements with the lowest bridging value (0.04) were: (a) "Courses in Philosophy that I have taken", (b) "The psychology courses that I have taken", and (c) "The course work in my other degrees". Statements in this cluster with higher bridging values include "Professional development day about mental health" (0.54) and "My background in special education" (0.56).

3.1.2.3 Work Experience

For the pre-service teachers, work experience was the cluster with the lowest overall bridging value, and thus the most cohesion. The statements in this cluster tended to reflect experiences outside of the faculty of education, particularly work and volunteer experiences with individuals and groups of people with disabilities. Within the cluster,

three statements had bridging scores of 0, meaning they were consistently sorted together by the majority of participants. These statements were: (a) “Teaching marine sciences to students who came on field trips”, (b) “Work at the Ministry of Justice with young offenders”, and (c) Working with a therapeutic riding program. Other statements with low bridging values include “Volunteering”, “Working at a summer camp for kids with disabilities”, and “Youth group work through the church”. Statements with higher bridging values were: (a) “A couple of students that I’ve had that have been exceptional” (0.54), and (b) “Seeing the success of learning centres” (0.77).

3.1.2.4 Practicum/Collaboration

The statements in the practicum/collaboration cluster tended to reflect experiences of learning from both supervising (mentor) teachers and students during practicum experiences. Within this cluster, the statement with the lowest bridging value was “Conversations with my associate teacher on practicum placement” (0.30). The statement with the highest bridging value was “Working with parents” (0.65).

3.2 New Teachers

3.2.1 Multidimensional Scaling: Data Point Map

A binary matrix was also created for the data from the 13 new teachers and multidimensional scaling was used to produce a point map (Figure 3). Just as with the previous point map, statements that are closer together were more commonly sorted together, whereas statements that are father apart were less consistently sorted together. For example, statement 43, “I tried to teach a student in the same way as everyone else and finding it doesn’t work” and statement 61, “Experience that all kids learn differently

and need different amounts of attention and support" are close together on the map, whereas the statements 72, "Great books give you ideas" and 52 "My nanny owns two group homes so I've grown up around that population of people" are located on opposite sides of the map. Kruskals stress value was used to determine the fit between the sorting data and the map. The stress values of the point map for new teachers was 0.295, which falls within the acceptable range of 0.205 and 0.365 and indicates a good fit (Kane & Trochim, 2007; Rosas & Kane, 2011).

Figure 3. *New Teacher Point Map*

3.2.2 Hierarchical Cluster Analysis: Cluster Map

As with the pre-service teacher data, hierarchical cluster analysis was used to fit the individual data points into groups or themes. We considered a number of cluster scenarios for this data, ranging from four to 12 clusters. Using the bridging values and our own understanding of the emerging themes, we found eight clusters to be an optimal

number for this data (Figure 4). Clusters in this map contained between seven to 23 statements and had average bridging values ranging from 0.13 to 0.72 (see Table 4 for a breakdown of the statements and bridging values within each cluster). The decision process for the appropriate number of clusters was the same as described above for the pre-service teachers. For example, when moving from the nine clusters to eight, the groups "personal experiences with learning disabilities" (bridging value = 0.12) and "education in the family" (bridging value = 0.14) merge to become "learning from personal experiences" (bridging value = 0.13). By simply considering the cluster labels and bridging values here it may seem like this merge does not make sense – as personal experiences with learning disabilities and education in the family could each represent a distinct idea. Upon examination of the statements within each group there were many similarities and overlapping themes. Thus, we do not lose any important context by merging the two and the new group "learning from personal experiences" better captures all the statements within the group. Looking at what happened when moving from eight and seven clusters, the groups "individual students" (bridging value = 0.27) and "experiences with exceptionalities" (bridging value = 0.33) merged to become "learning from others and own experiences" (bridging value = 0.30). While this may make sense based on the assigned labels and bridging values, when we reviewed the statements in the two original groups, we determined that these two groups should remain separate because they conveyed distinct themes and added important context to our understanding of the data.

Table 4. *New Teacher Breakdown of Statements by Clusters*

Statement	Bridging Value
Cluster 1: Overall Teaching Experiences	**0.31**
38. Watching students during engagement when they are learning by doing	0.21
25. Seeing so many different classrooms and such different teaching practices	0.22
31. My experiences overall as a teacher	0.22
25. Seeing so many different classrooms and such different teaching practices	0.22
75. Having met and worked with those students on an individual basis	0.24
1. Being able to work individually with those students at the tutoring centre	0.24
60. I was in a grade six class for practicum and the teacher really pushed hard about positive reinforcement	0.31
43. I tried to teach a student in the same way as everyone else and finding it doesn't work	0.31
2. Learning that they don't just give an IEP to anyone	0.32
64. Being a supply teacher it's very emotionally draining in dealing with these diverse classrooms and learners	0.32
61. Experience that all kids learn differently and need different amounts of attention and support	0.36
13. I'm a spec ed teacher	0.41
66. Seeing kids be aggressive and violent and clear the room	0.42
53. Supply teaching, I see a lot of things that make me wonder if we are doing inclusion the right way	0.50
Cluster 2: Classroom Experience with Exceptionalities	**0.44**
26. Student who was in my classroom	0.33

Table 4 (continued)

Statement	Bridging Value
63. I taught abroad for two years	0.34
56. Experience with a student with a tracheotomy who was not mobile	0.36
30. I have a student with autism who is non-verbal and has a full-time E.A.	0.45
22. There is a student in that classroom who's in a wheelchair	0.46
14. I taught students who were formally in the Developmentally Delayed room	0.49
78. I was an EA for a girl with FASD	0.51
50. I taught dance	0.57
Cluster 3: Teacher Collaboration	**0.27**
4. Putting a ton of energy into the students who are reluctant to be there and what that means down the road	0.22
35. My other mentor teachers that I'm working with this year	0.22
46. Having a conversation about particular students or different student needs	0.23
27. Talking to people who are already teaching the diverse classrooms and just having discussions	0.25
12. I think the biggest help was having a special education mentor teacher	0.26
24. Seeing the ways that teachers prepared for their teaching practices	0.31
84. Knowing your students as best as you possibly can and knowing their background	0.33
90. As teachers we can make a difference in achievement that's environmentally induced	0.34
Cluster 4: Learning from Students	**0.33**
34. Seeing that kids learn in different ways while volunteering in the classroom	0.26

Table 4 (continued)

Statement	Bridging Value
17. I guess over the years I've come to realize that every student does have the right to learn	0.29
5. My job as an outreach worker	0.30
76. As an EA I was more of an observer in the classroom	0.30
20. Those beliefs actually come from experiences outside of teaching	0.36
67. Stories from children	0.36
55. I had a class with a student with autism and the other kids treated him as any other student in the classroom	0.42
Cluster 5: Learning from Personal Experience	**0.13**
39. One of my best friends I grew up with um, is, I think fair to say Asperger's	0
23. I have a first cousin who's just recently passed away but he had severe autism, Tourette's, and epilepsy	0.01
73. I've got four children of my own and they're all different	0.02
74. We had friends of the family who had a daughter who was on the spectrum	0.03
71. I have an anxiety disorder	0.03
79. I actually grew up with a brother with autism and a brother who is gifted	0.03
83. My one friend who was completely blind	0.04
10. My grandfather was in a wheelchair and he was very successful	0.04
87. I know from my sister that if they're not able to do something it's not always because they're lazy	0.05
8. I have learning disabilities [dysgraphia and dyslexia]	0.06
7. My brother thinks that he's stupid because of his learning disability and not capable of achieving certain things	0.09

Table 4 (continued)

Statement	Bridging Value
65. I grew up in a home where diversity was accepted	0.11
77. I've learned from my brother that you have to be really patient - he can't do it today, but it doesn't mean he can't do it	0.11
6. Seeing my brother who has a diverse learning need that wasn't properly supported, and how that's affected all throughout his life	0.16
11. My father was a principal and my grandfather a superintendent	0.16
9. I grew up in an environment around students with special needs	0.19
41. Doing girl guides as a kid . . . we had a girl who was completely wheelchair bound	0.20
86. I saw my sister achieve when she had the accommodations she needed	0.21
19. I've worked as a social worker before I came into teaching	0.22
21. I've had family members who work in special education	0.27
16. Being in a city with diverse socio-economic backgrounds	0.29
52. My nanny owns two group homes so I've grown up around that population of people	0.35
82. The exposure to differences in others	0.43
Cluster 6: Training/Education	**0.22**
51. Articles that I've read in my B.Ed program	0.13
32. An undergrad course about exceptional children taught me about differences	0.14
54. Teacher's college was fantastic in informing about what the idea of growth mindset is	0.14
69. Taking these courses at university	0.15
3. Learning about IEP's in teachers college	0.17
47. The faculty of education made me think about what it would be like to be that student that didn't get it the first try	0.17

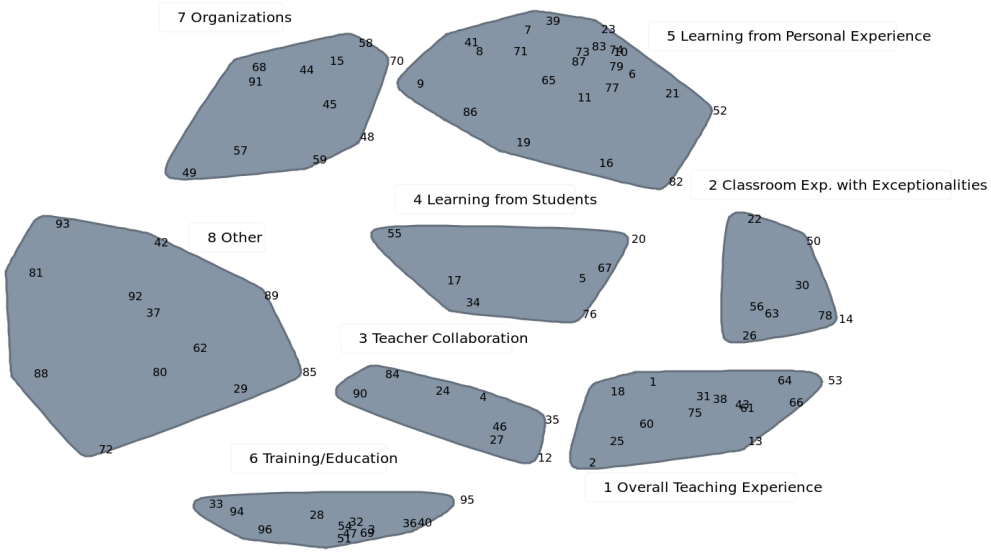
Table 4 (continued)

Statement	Bridging Value
36. Partly from my teacher training	0.21
28. Some training days [professional development] that have focused specifically on diverse learners	0.23
40. I took a couple classes on teaching English as a second language in the mainstream classroom	0.25
96. Learning about Blooms Taxonomy	0.25
94. Learning about different learning styles	0.27
95. Definitely school	0.37
33. I have a degree in family studies so that was my undergrad	0.43
Cluster 7: Organizations	**0.42**
58. I have visual processing disability and basically went through school and teachers just assumed that I wasn't smart	0.23
70. I was below average to average in school	0.26
15. I was viewed as being mentally deficient, so I was actually in a segregated classroom	0.33
48. My own personal education. I never struggled with academics, but I did struggle with athletics	0.35
45. Summer camp for kids affected with cancer	0.37
44. I remember elementary school being very much inclusive	0.40
59. Working at camp showed me that kids come from all different areas of life, all different walks of life	0.41
91. When I was a student I felt frustrated when we had to go as a class at a really slow pace because there's one student that just couldn't get it	0.45
68. When I was a student there was another student who was never included in the classroom so we did Best Buddies at lunch and recess but that was it	0.49
57. I volunteered with the Learning Disability Association	0.61

Table 4 (continued)

Statement	Bridging Value
49. I led a girls mentoring group	0.74
Cluster 8: Other	**0.72**
89. I've seen so many different ways people can succeed	0.52
85. Colleagues who do not like the inclusive classroom structure	0.54
29. Learning circles that I'm a part of	0.55
62. Having respect for the students	0.60
80. You need to approach a concept in various ways so that a child can understand it through different intelligences	0.62
72. Great books give you ideas	0.65
37. Person First Language has helped me to remember that students aren't their exceptionalities	0.71
42. I would say it was more a core belief system	0.73
81. Sincere empathy for others	0.79
92. Knowing that I can't meet the needs of every student all the time	0.93
93. Hearing about the success stories and how much better students do in some of these specialized programs	0.98
88. Twitter conversation about how much we protect kids versus letting them grow	1

Figure 4. *New Teacher Cluster Map*



The program generated suggested labels for the clusters based on the labels assigned by participants. We reviewed the suggested labels to ensure they appropriately reflected the statements in each cluster. It was decided that only three of the suggested labels adequately reflected the sentiment of the statements within the cluster. These were: “teacher collaboration”, “learning from personal experiences”, and “organizations”. For the remaining five clusters we carefully examined the statements within each to determine labels that effectively communicated the ideas within the group. The labels that we decided on were: “overall teaching experience”, “classroom experience with exceptionalities”, “learning from students”, “training/education”, and “other”. It is worth noting that the eighth cluster, labelled “other”, remained intact through multiple iterations of the concept map. This theme was present in all cluster map solutions ranging from five conceptual themes through to 10 conceptual themes. The suggested labels for this group included “beliefs”, “positive strategies/stories”, “values”, “future thinking”, “misleading

information" and "importance of relationships"; however, none of these labels accurately reflected the statements in this group.

3.2.2.1 Overall Teaching Experience

The statements in this cluster tended to reflect a broad range of teaching experiences, including classroom management, supply teaching, and differentiated instruction. The statements with the lowest bridging values in this cluster were "Watching students during engagement when they are learning by doing" (0.21) and "Seeing so many different classrooms and such different teaching practices" (0.22). The statement with the highest bridging value was "Supply teaching, I see a lot of things that make me wonder if we are doing inclusion the right way" (0.50).

3.2.2.2 Classroom Experience with Exceptionalities

These statements reflected experiences of having students with exceptionalities in the classroom. The statement with the lowest bridging value in this cluster was "Student who was in my classroom" (0.33). The statement with the highest bridging value was "I taught dance" (0.57).

3.2.2.3 Teacher Collaboration

The statements in the teacher collaboration cluster reflected experiences of learning from colleagues. Some of the statements specifically mention learning from colleagues who have prior experience in special education or with students with disabilities. An example of a statement with a low bridging value is "My other mentor teachers that I'm working

with this year" (0.22). The statement with the highest bridging value was "Knowing your students as best you possibly can and knowing their background" (0.33).

3.2.2.4 Learning from Students

These statements reflected experiences with students in the classroom and in other capacities (e.g., as an outreach worker). The statement with the lowest bridging value was "Seeing that kids learn in different ways while volunteering in the classroom" (0.26). The statement with the highest bridging value in the learning from students cluster was "I had a class with a student with autism and the other kids treated him as any other student in the classroom" (0.42).

3.2.2.5 Learning from Personal Experience

For the new teachers, this theme had the lowest overall bridging value. These statements tended to represent firsthand experiences as well as experiences of family members and close friends. Most of the statements refer to experiences related to exceptionalities. The statements with the lowest bridging values were "One of my best friends I grew up with um, is, I think fair to say Asperger's" (0), "I've got four kids and they're all different" (0.02), and "I actually grew up with a brother with autism and a brother who is gifted" (0.03). The statement with the highest bridging value was "The exposure to differences in others" (0.43).

3.2.2.6 Training/Education

The majority of these statements reflected experiences related to pre-service teacher education. The statements with the lowest bridging values in this concept were "Articles that I've read in my Bachelor of Education program" (0.13) and "An undergrad course

about exceptional children taught me about differences" (0.14). The statement with the highest bridging value in this group was "Definitely school" (0.37).

3.2.2.7 Organizations

The statements in the organizations cluster reflected participants' own experiences going through the school system as well as experiences with organizations like the Learning Disability Association and Best Buddies. The statement with the lowest bridging value in this concept was "I have a visual processing disability and basically went through school and teachers just assumed I wasn't smart" (0.23). The statement with the highest bridging value was "I led a girl's mentoring group" (0.74).

3.2.2.8 Other

This cluster had the highest overall bridging value. The lowest bridging value in this group (0.52) is actually a value that would typically be considered quite high. Overall, the statements in this group do not represent a conceptual theme. What these statements do have in common is that they almost all represent things that would not be considered experiences at all (e.g., having respect for students, sincere empathy for others).

Chapter 4

4 Discussion

The goal of the current study was to first and foremost gain an understanding of the experiences that influence beginning teachers' beliefs about how students learn in diverse and inclusive classrooms. Subsequently, we sought to deepen this understanding by comparing the experiences of pre-service and newly graduated teachers. Group concept mapping analysis revealed four thematic clusters for pre-service teachers and eight thematic clusters for new teachers. The contents of each cluster and their implications for teacher education are discussed below.

4.1 Pre-service Teachers

Group concept mapping analysis revealed four thematic clusters that are at the center of pre-service teachers' beliefs as they relate to educating diverse learners: (1) personal experience with diversity, (2) education, (3) work experience, and (4) practicum/collaboration.

4.1.1 Personal Experience with Diversity

The statements within the personal experience with diversity cluster relate to both firsthand experiences of having an exceptionality and also experiences of being close to people with exceptionalities (e.g., family and friends). It is not surprising that these experiences are significant for pre-service teachers. Past literature has shown that pre-service teachers who know someone with a disability on a personal level hold more inclusive beliefs (Specht et al., 2016) and have fewer concerns about teaching students with diverse learning needs (Forlin et al., 2009; Park et al., 2018; Sharma & Nuttal,

2016). Further, Park et al. (2018) reported that teachers who have a family member or close friend with a disability were more confident for meeting the needs of diverse learners.

4.1.2 Education

Statements within the education cluster emphasized the role of courses within the faculty of education and beyond. This finding corroborates past research that has shown the effectiveness of specific courses and modules designed to teach about inclusive education and influence pre-service teachers' beliefs (Gilham & Tompkins, 2016; Lanterman & Applequist, 2018). That said, approximately one third of the statements in this concept suggest that education outside of the faculty of education (e.g., an engineering degree, course work in my other degrees) has been instrumental in shaping pre-service teachers' beliefs. This finding suggests that while teacher education is important for pre-service teachers, their coursework prior to their Bachelor of Education also influences beliefs.

4.1.3 Work Experience

Many of the statements in the work experience cluster referred to experiences with an individual or group with diverse needs (for example, "Summer camp for kids with disabilities", "Working with a girl with Autism at a daycare", "A student who was a select mute"). Some of the statements in this group made explicit connections to volunteer experiences. Kang and Martin (2018) and Mergler et al. (2016) highlight the significance of service learning (sometimes referred to as experiential learning) for providing pre-service teachers with firsthand, meaningful experiences with people with disabilities. It is possible that these seemingly more informal experiences provide pre-service teachers with an opportunity to develop relationship building skills, while also

learning to think outside of the box when it comes to meeting the needs of diverse learners (Kang & Martin, 2018). While this literature suggests that service learning can be an effective addition to teacher training, it is important to note that the majority of the experiences that pre-service teachers are referring to in their statements took place outside of and without the organization of their teacher education program.

4.1.4 Practicum/Collaboration

The statements in the practicum/collaboration cluster included both learning from practicing teachers as well as from students during practicum experiences. This cluster corroborates the finding of Young et al. (2018), that establishing meaningful relationships with students and school staff (e.g., teachers and educational assistants) are an important part of professional development for pre-service teachers. The mentorship of more experienced teachers plays an important role in the development of beginning teachers (Buehl & Fives, 2009). This transfer of knowledge is absolutely critical because while it may help foster more positive beliefs, there is also a chance that it could expose pre-service teachers to beliefs that actually hinder the development of inclusive practices (Essex et al., 2019; Tangen & Beutel, 2017). For example, in Canada it is possible that supervising teachers on practicum experiences have little to no formal training in inclusive practices (Sokal & Sharma, 2014).

4.1.5 Pre-service Teachers Summary

Pre-service teachers identified four distinct sets of experiences that influence beliefs. These themes suggest that experiences prior to teacher education have just as much influence – if not more – on pre-service teachers' beliefs. Thus, it is important for pre-service teachers to have meaningful experiences with diversity *before* entering their

teacher education program. Within the scope of teacher education, both coursework and practicum experiences were found to influence beliefs. Practicum experiences should reflect the inclusive philosophy that is being taught through coursework (Sharma, 2018; Tangen & Beutel, 2017).

4.2 New Teachers

Through the group concept mapping analysis, we identified eight concepts that are central to the development of new teachers' beliefs as they related to educating diverse learners: (1) overall teaching experience, (2) classroom experience with exceptionalities, (3) teacher collaboration, (4) learning from students, (5) learning from personal experience, (6) training/education, (7) organizations, and (8) other.

4.2.1 Overall Teaching Experience

In line with the finding of Buehl and Fives (2009), practicing teachers in the current study trust and rely on the information gathered from their own teaching experience. The statements in this cluster largely refer to direct classroom experience with students; however, it is also likely that other elements of teaching experience – administrative support and school resources, for example – also influence beliefs (Ortúzar, 2019). Some of the statements in this cluster reflect the sentiment that inclusion is challenging and "emotionally draining". Like Ballantyne (2007) suggested, these experiences can cause fatigue and have a negative influence on teachers' beliefs about diverse learners and inclusive education.

4.2.2 Classroom Experience with Exceptionalities

This cluster provides a deeper understanding of the specific elements of overall teaching experience that influence beliefs. As the name of this cluster suggests, participants referenced teaching experiences with students with exceptionalities, suggesting that teaching students with exceptionalities is distinct from other teaching experiences. Sokal and Sharma (2017) found that direct experience teaching in inclusive classrooms was associated with positive attitudes and higher efficacy for teaching in inclusive classrooms. Although not explicitly stated, the impression from this cluster is that teachers are referring specifically to experiences of integrating diverse learners into the classroom and what that means from an instructional perspective.

4.2.3 Teacher Collaboration

This cluster suggests that in addition to relying on their own teaching experience, new teachers also rely on that of their colleagues. This finding fits within the model presented by Buehl and Fives (2009), which outlined collaborative learning – sharing, discussing, mentorship, and colleagues – as a main source of information for practicing teachers. Specifically, new teachers mention the importance of collaborating with teachers who have experience meeting the needs of diverse learners, like special education teachers. The statements within this group suggest that teacher collaboration commonly takes the form of informal discussions and observations, as opposed to structured collaborative efforts.

4.2.4 Learning from Students

On the surface this cluster might seem redundant with the classroom experiences with exceptionalities cluster; however, the content of the statements does suggest a unique

theme. The statements in the learning from students cluster largely identified interactions with students in capacities beyond simply delivering content and emphasize the importance of developing a "whole picture" understanding of students. Young et al. (2018) concluded that building strong relationships with students is an important part of working with diverse learners. Statements in this cluster – such as "stories from children" – also suggest the significance of building meaningful relationships with students.

4.2.5 Learning from Personal Experience

Like with the pre-service teachers, it is not surprising that personal experiences have influenced new teachers' beliefs. The statements in this cluster provide further support for past research (Forlin et al., 2009; Park et al., 2018; Sharma & Nuttal, 2016; Specht et al., 2016), suggesting teachers with personal experience with disability tend to have fewer concerns about inclusive education. Some of the statements in this group reflect broader experiences with diversity, such as living in a city surrounded by diverse socioeconomic status.

4.2.6 Training/Education

Just over half of the statements in this cluster made reference to experiences in a faculty of education, suggesting that these experiences are not only significant at the pre-service level, but continue to be relevant into the early years of a teacher's career. Surprisingly, only one statement in this cluster referred to formal professional development. It is unclear whether this is due to participants receiving professional development that was irrelevant or ineffective, or simply due to a lack of professional development opportunities. Past research has found that practicing teachers' beliefs can be resistant to professional development (Jordan, 2018b); however, other literature – such as

Desimone's (2009) framework – support the influence that proper professional development can have on beliefs.

4.2.7 Organizations

The statements in this concept broadly reflected experiences with various organizations (e.g., Best Buddies, Learning Disabilities Association, summer camps) that have influenced beliefs. Statements in this cluster also refer to the experience of going through the education system as a student. Some of the statements reflect positive experiences (e.g., "I remember elementary school being very much inclusive"), while others reflect more negative experiences (e.g., "I was viewed as being mentally deficient…"). The experiences in this cluster reflect the role that organizations and society as a whole can play in shaping our beliefs from a young age.

4.2.8 Other

The statements in this group are not closely related to one another on a conceptual level; however, are all similar in that they do not actually reflect experiences. Many of the statements in this group were problematic from a data sorting perspective because they did not accurately answer the question that was asked. In other words, these statements more so reflected the belief itself rather than the experience or experiences that influenced the belief.

4.2.9 New Teachers Summary

The themes on the new teachers' concept map emphasize the influence that early career experiences have on beliefs. Experiences prior to becoming a teacher, like firsthand or familial experience with disability, also influence new teachers' beliefs. Further, these

results show that pre-service training has a lasting influence on beliefs, as evident from the education/training cluster, and provide little evidence of the influence of formal professional development.

4.3 Comparing Pre-service and New Teacher Results

A comparison of the point maps alone (Figures 1 and 3) reveal two very different stories for pre-service and new teachers. It is clear just from visually examining Figure 1 that the pre-service teachers tended to agree on four common themes. A look at the new teachers' point map (Figure 3), however, appears sporadic with no obvious clusters. It is possible that the experience gained in the early years of teaching encouraged new teachers to reflect on their past experiences and develop a more complex understanding of their beliefs. It is also possible that experiences in the first years of teaching have challenged new teachers' beliefs, making it difficult to identify their beliefs and isolate the critical experiences that have shaped them.

Despite there being twice as many clusters for new teachers, each of the four themes found on the pre-service map are, to some extent, also reflected on the new teachers' map. For example, education, collaboration and learning from personal experiences are all seen on both maps. The experiences reflected in the "work experience" cluster on the pre-service map are similar to experiences in the "organizations" and "learning from students" clusters on the new teachers' map. The commonality between these clusters is a focus on building meaningful relationships and the idea of moving beyond seeing individuals within the scope of their strengths/needs assessment.

The influence of the faculty of education on pre-service teachers' beliefs is very clear based on their concept map. Two out of the four conceptual themes (education and practicum/collaboration) are based on experiences provided by the faculty of education. In this sense there is a near fifty-fifty divide on the pre-service map – approximately half of the experiences can be characterized as happening within the teacher education program and half as happening outside of the teacher education program. The role of teacher education is much less prominent on the new teachers' map, representing only one of eight themes. Career-based experiences become much more significant at the new teacher level, as evident by the themes "learning from students", "overall teaching", "classroom experience with exceptionalities" and "teacher collaboration".

4.4 Limitations and Future Directions

In the group concept mapping process one of the most important things a researcher has to do is select a strong focus prompt. For this study our prompt was "What experiences have influenced your belief in how students learn in diverse classrooms?". The prompt was originally used in an interview and generated a wide range of rich responses from participants. Converting these responses to simple statements for the group concept mapping process was a challenge because the context of the interview response needed to be conveyed through brief statements. As a result, it is not always clear to us as readers and to our participants in the sorting task whether the experiences in these statements had a positive or negative effect on beliefs. Additionally, more care and attention should have been given to ensure that all the statements included in this study accurately answered the question that we were asking.

The results from the current study do not provide us with any indication as to the perceived importance of each cluster. For example, do new teachers think that learning from personal experience is more important than learning from students, or vice versa? While incorporating importance ratings is time consuming for participants, having this information would allow us to make more sound conclusions and recommendations based on the data. Future research should explore the possibility of using the importance rating function of the concept mapping software to further bolster these results.

Finally, we know that while beliefs play a critical role in developing inclusive practices, beliefs on their own are not sufficient. Thus, future research should explore the experiences that influence beginning teachers' instructional practices and efficacy for teaching in inclusive classrooms. This – along with the findings of the current study – will allow teacher educators to have a full picture of what is necessary to prepare teachers for inclusive classrooms according to Sharma's (2011) 3H framework.

4.5 Implications for Practice

The results of the current study demonstrate that pre-service and new teachers' beliefs are influenced by similar experiences. Personal experience with exceptionalities (either firsthand or with a family member or a close friend) is a common theme on both maps, as is working with individuals or groups with exceptionalities outside of the classroom setting. These findings suggest that an individual's experiences before they begin their teacher training are important for developing their beliefs. Therefore, faculties of education may wish to indicate to potential teacher candidates that prior experience with diverse learners is important for developing beliefs that will support an inclusive practice. Additionally, teacher education programs should provide pre-service teachers with the

opportunity for alternate field experiences (i.e., outside of the school) with diverse learners.

We also know from these findings that early career experiences significantly influence new teachers' beliefs. School administrators and superintendents should pay particular attention to ensure that new teachers are supported and able to succeed. This information can also be used to enhance pre-service preparation. It is within the scope of practicum experiences to ensure that pre-service teachers are exposed to the experiences that new teachers indicated significantly influenced their beliefs. For example, teacher education programs should ensure that pre-service teachers have the opportunity for classroom experiences with students with exceptionalities while on practicum. They should also ensure – or at least encourage – that pre-service teachers develop meaningful relationships with students during their practicum experiences.

The findings of the current study also call for careful consideration of the role of formal professional development for new teachers. The lack of mention of professional development from the new teachers could be explained by a general lack of opportunity for relevant professional development; however, it could also suggest that formal education surrounding topics of inclusion and diverse learners is more meaningful when received during pre-service training.

Overall, these results indicate that teachers who have prior experience with individuals with exceptionalities, both in a personal and professional capacity, are better prepared to teach students with diverse learning needs. Teacher education programs and schools themselves can play an important role in providing beginning teachers with these

experiences. The results of this study will support the development of beginning teachers' beliefs about teaching and learning in diverse classrooms. These beliefs will influence teachers' instructional practices and ultimately allow both students and teachers to thrive in inclusive classrooms.

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Appendices

Appendix A: Letter of Information

Western Education

Project Title:
The Development of Inclusive Educational Practices for Beginning Teachers

Principal Investigator:
Dr. Jacqueline Specht, Professor, Western University, London, ON

Letter of Information

Invitation to Participate

My name is Dr Jacqueline Specht and I am a Professor at the Faculty of Education at The University of Western Ontario. I am the director of the Canadian Research Centre on Inclusive Education and we are currently conducting research into beginning teachers' beliefs of inclusive education practices in Canadian classrooms and would like to invite you to participate in this study.

Purpose of the Letter

The purpose of this letter is to provide you with information required for you to make an informed decision regarding participation in this research.

Purpose of this Study

The purpose of this study is to explore the self-efficacy, beliefs, and instructional practices of beginning teachers identifying the factors that shape their development over time and in the context of their initial teaching experiences. Through this study, we hope to gain a better understanding of how teachers develop their instructional knowledge and practice to meet the needs of students in diverse Canadian classrooms, through the first years as an educator.

Inclusion Criteria

Individuals who are currently enrolled in a teacher education program or who are beginning their careers in teaching are eligible to participate.

Exclusion Criteria

Individuals who are not currently enrolled in a teacher education program or who are not beginning their careers in teaching are not eligible to participate.

Study Procedures

If you agree to participate in this study you will be asked to sort statements that people have provided to us in interviews related to experiences that have influenced their practice of teaching in inclusive classrooms. You will be provided with approximately 100 statements to sort them into categories that make sense to you The entire process will take about 60 minutes.
.

Possible Risks and Harms

There are no known risks or harms associated with participation in this study.

Possible Benefits

The possible benefits to participants include enhanced knowledge about themselves as educators (strengths and weaknesses) and enhanced knowledge of effective educational practices in working with diverse learners. Participants may benefit from improved teacher training opportunities that develop from this research. Societal benefits of this study include enhanced professional practice for teachers, training and skill development for teachers, and new and enhanced partnerships amongst researchers in education.

Compensation

You will be given a $25 gift certificate for Starbucks for participating in this study.

Voluntary Participation

Participation in this study is voluntary. You may refuse to participate, refuse to answer any questions or withdraw from the study at any time with no effect on your future employment. Withdrawing your participation or not answering questions will not disqualify you from receiving the gift certificate.

Confidentiality

All data collected will remain confidential and accessible only to the investigators of this study. Your sorting and ratings of the statements will be anonymous.

Digital data will be stored on a password-protected computer on a secure network behind institutional firewalls, which will only be accessible to the researchers. If the results are published, your name will not be used. If you choose to withdraw from this study, your data will not be destroyed. All data will be kept by the researcher and stored securely for a minimum of five years. Data will be destroyed when no longer needed.

Contacts for Further Information

If you require any further information regarding this research project or your participation in the study you may contact Dr. Jacqueline Specht, Principal Investigator, by telephone at [illegible], or email to [illegible].

Representatives of Western University's Non-Medical Research Ethics Board may contact you or require access to your study-related records to monitor the conduct of the research.

If you have any questions about your rights as a research participant or the conduct of this study, you may contact The Office of Research Ethics , email:

Publication

If the results of the study are published, your name will not be used. If you would like to receive a copy of any potential study results, please provide your name and contact information in the designated area after completion of the survey.

Consent

Participating in the sorting task implies consent to participate.

This letter is yours to keep for future reference.

Appendix B: Ethics Approval Letter

Date: 27 November 2019

To: Dr. Jacqueline Specht

Project ID: 106761

Study Title: The Development of Inclusive Educational Practices for Beginning Teachers

Application Type: NMREB Amendment Form

Review Type: Delegated

Full Board Reporting Date: December 6 2019

Date Approval Issued: 27/Nov/2019

REB Approval Expiry Date: 17/Jul/2020

Dear Dr. Jacqueline Specht,

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the WREM application form for the amendment, as of the date noted above.

REB members involved in the research project do not participate in the review, discussion or decision.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario. Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB. The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Please do not hesitate to contact us if you have any questions.

Sincerely,

Kelly Patterson, Research Ethics Officer on behalf of Dr. Randal Graham, NMREB Chair

Note: This correspondence includes an electronic signature (validation and approval via an online system that is compliant with all regulations).

Curriculum Vitae

Name:	Jessica Delorey
Post-secondary Education and Degrees:	St. Francis Xavier University Antigonish, Nova Scotia, Canada 2013-2018 B.Sc. Western University London, Ontario, Canada 2018-2020 M.A.
Honours and Awards:	Nova Scotia Health Research Foundation Scotia Scholar Award 2017-2018 St. Francis Xavier University First Class Honours 2018
Related Work Experience	Research Assistant St. Francis Xavier University 2017-2019 Research Assistant Western University 2018-Present

Publications:

Delorey, J., Austen, E., & Foran, A. (2020). Showing the way to inclusive outdoor education: Impact of hands-on training in adapting a kayak. *Exceptionality Education International, 30*(1).

Presentations:

Specht, J., **Delorey, J.**, Ismailos, L., Fairbrother, M., Charles, E., & Villella, M. (2021, August). *Experiences that shape beginning teachers' inclusive practice beliefs: A group concept mapping study*. Presented at ISEC 2020, London, UK.

Austen, E., **Delorey, J.**, & Foran, A. (2021, March). *Creating points of access.* Presentation delivered at ECIS PE Access for All Conference, Amsterdam, Netherlands.

Specht, J., Charles, E., de Lugt, J., **Delorey, J.**, Gallagher, T., Howell, G., Ismailos, L., Lau*, Z.*, Maich, K., McGhie-Richmond, D., Metsala, J., Sider, S., Thompson. S., Thorne, C., Villella, M., Whitley, J., & Young, G. (2020, May/June). Inclusive education and beginning teachers: Implications for research and practice. Symposium presented at the

Canadian Society for the Study of Education presented at the Canadian Society for the Study of Education, London, Canada. (Conference cancelled)

Delorey, J. (2018, May). *Teachers' attitudes and perceptions of adaptations for inclusive outdoor education.* Oral presentation delivered at the 42nd annual Science Atlantic Psychology conference, Dalhousie University, Halifax, NS.

Delorey, J. (2018, March). *Teachers' attitudes and perceptions of adaptations for inclusive outdoor education.* Poster presented at the 16th Annual Student Research Day, St. Francis Xavier University, Antigonish, NS.