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Contributors of Pre-Service Teachers' Self-Efficacy for Teaching in Inclusive Classrooms: How Predictors of Self-Efficacy Change Over Time

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Abstract

This study investigated the extent to which demographic, experiential, and belief factors at two points in time predict pre-service teachers' self-efficacy for teaching in inclusive classrooms, and how predictors change over time. Two hundred sixty-four Canadian pre-service teachers completed a demographic questionnaire, the Beliefs about Teaching and Learning Questionnaire (BLTQ) and the Teacher Efficacy for Inclusive Practices scale (TEIP) toward the beginning and at the end of their teacher education. The results showed that at both times, Canadian pre-service teachers have very strong pro-inclusion beliefs and have very high levels of self-efficacy for teaching in inclusive classrooms. Significant improvements over time were seen in pre-service teachers' Efficacy to Use Inclusive Instruction and Efficacy to Manage Behaviour. Furthermore, the level of personal and professional experience that pre-service teachers had with diverse populations became significant predictors of all factors of self-efficacy for teaching in inclusive classrooms toward the end of their education.

Keywords: Inclusive education, pre-service teacher, self-efficacy, teacher education, inclusive beliefs

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Introduction

Inclusive Education in Canada

In 1985, Section 15 of the Canadian Charter of Rights and Freedoms was enacted. This amendment cemented the notion that every citizen, regardless of race, sex, religion, or mental or physical disability has equal rights and equal protection and equal benefit of the law without discrimination (Constitution Act, 1982). Nine years later in Salamanca Spain, UNESCO published the Salamanca Statement: an international call to action for world governments to recognize that every child, regardless of ability has the right to a quality education. The statement urges governments to make educational funding a top priority, implement laws surrounding inclusive practices, and to foster international collaboration (UNESCO, 1994). The Salamanca Statement and the Section 15 of the Charter of Rights and Freedoms are the backbone of inclusive education policies for all Canadian provinces and territories, which in recent decades have shifted from exclusive models where students requiring special educational needs were removed from the general education classroom and taught separately, to inclusion-first policies in which students should only be taken out of the general education classroom as a last resort.

Since its inception, the inclusive model of education has been debated. The inclusion of all students, regardless of ability within a general education classroom has raised concerns from both teachers and parents. Although full inclusion of all students is a noble goal, critics have advocated against a one-size-must-fit-all policy. Parents have expressed concerns that students with disabilities may not get the support that they require within a general education classroom (Tkachyk, 2013). Teachers have raised concerns about the increased workload that an inclusive classroom will bring and an overall lack of proper training for teaching students with more

severe behavioral challenges and developmental disabilities (Kahn & Lewis, 2014; Monsen, Ewing, & Kwonda, 2014). While debates regarding inclusion are ongoing, what is important to remember is that despite such perceptions from some parents and stakeholders, inclusion at its core is not a one-size-fits-all policy. The goal of inclusion is an equitable, not equal classroom. Within a true inclusive model, all students receive the support that they need in order to learn within a general education classroom. Studies into the outcomes of students within inclusive education classrooms has been generally supportive toward the inclusive model. Ruijs, Van der Veen, and Peetsma (2010) examined the academic outcomes, social skills development, and behaviour of children without special educational needs within inclusive and non-inclusive classrooms. Results of their study indicated that there were no significant differences between either classroom, indicating that children without special educational needs are not at a disadvantage by being in an inclusive classroom. Similarly, in two separate reviews comparing the outcomes of students within inclusive and segregated classrooms, encompassing 1373 articles from eight journals and 18 meta analyses respectively, results showed that an inclusive model was either superior or the same when compared to a segregated model with regards to student academic achievement, social skills development, and behavioural outcomes (Lindsay, 2007; O'Rourke, 2015).

As the paradigm of education continues to shift toward an inclusive model, general education teachers are expected to be able to provide quality instruction to students possessing a wide range of abilities, exceptionalities, and needs. For all students to receive the education that they are entitled to, teacher education programs must graduate teachers with high levels of self-efficacy for their abilities to teach within inclusive classrooms. Teachers who feel confident in their ability to teach report higher levels of job satisfaction, experience less stress with teaching,

and have a more positive outlook on the teaching profession (Jamil, Downer, & Pianta, 2012). They are less likely to experience burn-out, less likely to leave the teaching profession, are more open to new ideas, more patient with struggling students, and are more likely to persist in the face of the many challenges that teachers face within the classroom (Lindsay, 2007; Woolfolk-Hoy & Spero, 2005).

How Self-Efficacy Develops

Bandura (1997) hypothesized that there are four sources from which self-efficacy develops. The first source is mastery experiences. Mastery experiences are opportunities to complete a task successfully and are thought to have the most significant impact toward the development of self-efficacy. When a person is successful with a task, his or her self-efficacy for completing that task increases. Within the context of education for example, if a teacher successfully implements a lesson plan, his or her confidence for implementing that lesson plan in the future should increase. The second source of self-efficacy is vicarious experiences, which are the observations of role-models. If a role-model is observed succeeding in a task, the self-efficacy of the observer for that task will increase, especially if the observer closely relates to the role-model. Within a teaching context, this may take the form of a pre-service teacher observing his or her associate teacher teach a lesson successfully. The third source is social persuasion from influential figures. Positive feedback from an influential source will lead to higher levels of self-efficacy toward the task for which that feedback was received. For a teacher candidate, such feedback may be praise from a principal or a supervising teacher during a practicum. The fourth and final contributor to the development of self-efficacy is states of physiological and emotional arousal, and how such states are interpreted. Woolfolk-Hoy and Spero (2005) describe how a teacher's heightened level of arousal may be interpreted as anxiety for failure, or excitement for

success. An interpretation of excitement coupled with mastery experiences may strengthen self-efficacy beyond mastery experiences alone (Bandura, 1997, Woolfolk-Hoy & Spero, 2005).

Measuring Self-Efficacy for Inclusive Practices

Measuring teachers and pre-service teachers' self-efficacy has been the interest of several Canadian and international studies. A variety of methods have been used including interviews with teachers (Ahsan, Deppeler, & Sharma, 2013), self-developed questionnaires (Scheer, Sholz, Rank & Donie, 2015), and pre-existing scales (Sharma, Loreman, & Forlin, 2012). However, in recent years, many studies seeking to measure self-efficacy for inclusive teaching have used the Teacher Efficacy for Inclusive Practices (TEIP) Scale (Ahsan, Sharma, & Deppeler, 2012; Friesen & Cunning, 2018; Sharma, Shaukat, & Furlonger, 2015; Specht & Metsala, 2018; Specht et al., 2016). The TEIP is an assessment of self-efficacy for four factors integral to the successful implementation of inclusive practices. The three factors measured are Efficacy to use Inclusive Instruction, Efficacy in Collaboration, and Efficacy in Managing Behaviour. After an extensive review of inclusive education research and past scales measuring teacher efficacy, Sharma, Loreman, and Forlin (2012) concluded that these factors best capture the core skills required to effectively teach in inclusive classrooms. The items included in the scale and the factors assessed were further validated by the evaluation of experts in inclusive practices from six universities across the world.

Contributors to Self-Efficacy

The following section will be a review of the existing literature surrounding demographic, experiential, and belief factors that have been demonstrated to contribute to pre-service and new teacher's levels of self-efficacy for teaching within inclusive classrooms. The

scope of this review will include Canadian as well as several international studies, as the majority of research into teacher's level of self-efficacy and its contributors has been done internationally. As inclusive education is the prevailing educational model within these contexts (Ahsan, Deppeler, & Sharma, 2013; Nketsia & Saloviita, 2013; Scheer, Scholz, Rank, & Donie, 2015; Sharma & Sokal, 2015; Stella, Forlin, & Lan, 2007) and the developmental trajectory of self-efficacy beliefs is unlikely to be different across countries (Bandura, 1997), international results are thought to be applicable to a Canadian context.

Experience

Both domestic and international studies have indicated that pre-service teachers who have had more interactions and opportunities to work with diverse learners report feeling more confident in their abilities to teach within inclusive classrooms (Nketsia & Saloviita, 2013; Sharma, Shaukat, & Furlonger. 2015; Specht et al., 2016; Specht & Metsala, 2018). In a large Canadian study investigating pre-service teachers' beliefs and self-efficacy toward inclusion, Specht et al. (2016) reported that those who have experience teaching in diverse classrooms, have friends or family who are diverse learners, or work or volunteer with diverse learners scored higher on the Teaching Efficacy for Inclusive Practices scale (TEIP) compared with those without such experiences. Similar findings were shown in another large Canadian study. Specht and Metsala (2018) also used the TEIP to measure pre-service teachers' sense of self-efficacy for teaching in inclusive classrooms and concluded that pre-service teachers who have had more experiences with diverse populations report feeling more confident in their abilities to teach within inclusive classrooms. Internationally, Sharma, Shaukat, and Furlonger (2015) reported a similar trend in Pakistani pre-service teachers. Those who reported a high level of experience for teaching diverse learners scored significantly higher on the TEIP compared to those who

reported some experience or no experience. In Ghana, Nketsia and Saloviita (2013) used a questionnaire they developed to measure pre-service teacher's self efficacy for inclusive teaching. Results of their study indicated that pre-service teachers who had direct experience with a child with Special Educational Needs (SEN) felt the most confident and the most prepared to teach other students with SEN compared to pre-service teachers without such experiences.

A common source of experience with diverse learners for pre-service teachers are classes taken within teacher education programs and practicums. Teacher education has been shown to be a significant contributor to the development of teacher's self-efficacy for teaching within inclusive classrooms across several studies and contexts (Sharma & Sokal, 2015; Stella, Forlin, & Lan, 2007). However, results are mixed with regards to what type of education produces the most self-efficacious teachers. Lancaster and Bain (2010) conducted a comparison study between a traditional classroom-based approach to teaching about inclusive education and a field-based practical approach. In the traditional classroom setting, participants attended lectures on topics such as collaboration, teaching practices, peer assisted learning, and participated in skill-building workshops based on the lecture topics. In the field-based approach, participants still attended lectures and workshops, however, once a week they traveled to local community centres to work one-on-one or in small groups with children with learning disabilities, where they would provide literacy and numeracy instruction. Lancaster and Bain (2010) concluded that teachers who participated in both forms of training experieced increases in self-efficacy for teaching within inclusive classrooms, however there were no statistically significant differences found between participants in either group.

Conversely, Sokal, Woloshyn, and Funk-Unrau (2013) compared students enrolled in a special education course who completed a practicum with students in that same course who did

not. Similar to Lancaster and Bain (2010), both groups experienced an increase in self-efficacy for teaching within an inclusive classroom, however the group who participated within the practicum reported feeling significantly more efficacious with regards to managing classroom behaviour. The practicum experience provided the pre-service teachers with opportunities to try out the behaviour management techniques learned in classes, giving them an opportunity to see first-hand which strategies work and which do not work. The practical application of theory in conjunction with support from mentoring teachers are thought to be what contributed to the increase in confidence managing student behaviour within an inclusive classroom.

In addition to the type of education received, the length of pre-service teaching placements appears to have an impact on teacher's self-efficacy. Colson et al. (2017) investigated the differences in pre-service teachers' sense of self efficacy before and after either a year-long teaching placement or a 16-week placement. Results of their investigation determined that pre-service teachers who participated in the year-long practicum were more satisfied with their experience, were better able to manage classroom behaviour, and reported a greater sense of self-efficacy for teaching. A longer teaching placement likely meant that pre-service teachers had more opportunities for high-quality interactions with students and more opportunities for success. As mastery experiences are thought to be the most significant factor for the development of self-efficacy beliefs, this is likely what contributed to the results of this study.

Sokal and Sharma (2017) compared three groups of teachers with regards to their attitudes and self-efficacy toward teaching within an inclusive classroom. The three groups that were compared were teachers who had completed inclusive education coursework, but did not have experience teaching within an inclusive classroom, teachers who taught in inclusive

classrooms, but had not completed any special education coursework, and teachers who both had experience teaching within an inclusive classroom and who completed inclusive education coursework. Results indicated that teachers who had both practical experience and education in inclusive practices reported higher levels of confidence and more positive attitudes toward inclusive education compared to teachers who had taken classes, but had limited practical experience.

Furthermore, Sharma and Sokal (2015) investigated the impact that a teacher education course on inclusive education had on the confidence, concerns, and attitudes toward inclusive education on a sample of Canadian and Australian pre-service teachers. Canadian teachers completed a 30-hour course, and Australian teachers completed an 18-hour course. At the end of the courses, both Canadian and Australian teachers reported feeling more confident at teaching in an inclusive classroom, and their attitudes toward inclusive education were more positive. Similarly, Sharma and Nuttal (2014) investigated the impact that a nine-week inclusive education course had on the attitudes and self-efficacy of Australian pre-service teachers. The course focused on what inclusion is, local policies, arguments for and against the use of inclusive instruction, effective teaching strategies, and how teachers' beliefs and attitudes can affect the learning environment. After the course, participants reported feeling more confident in their abilities to use inclusive instruction, collaborate with other teachers, and manage classroom behaviours.

Teachers who have more experience with diverse learners tend to feel more confident in their abilities to teach within diverse classrooms. Whether the experience is personal, professional, or within a teacher education setting, research has illustrated that more experience equates to more confidence. Direct experience with diverse populations provides pre-service

teachers opportunities for mastery experiences, which are the most significant contributor to the development of self-efficacy (Bandura, 1997). Such mastery experiences may take the form of successfully implementing lesson plans or having positive interactions with diverse learners.

Gender

Research surrounding gender differences has shown that gender has a significant impact on particular areas of self-efficacy for teaching in inclusive classrooms. Using the TEIP scale with a large sample of Canadian pre-service teachers, Specht et al. (2016) concluded that men felt more efficacious for managing student behaviour within an inclusive classroom as they finished their teacher education programs. There were no significant gender differences observed in the teachers' efficacy to use inclusive instruction and their efficacy to collaborate with other teachers. Similar results were found in a large study of pre-service teachers' self-efficacy toward the end of their education conducted by Specht and Metsala (2018). Again, using the TEIP, results of their study concluded that males report feeling more confident at managing behaviour within inclusive classrooms, and males planning to teach elementary school feeling more confident in their abilities to use inclusive instruction. Internationally, in a large study of Bangladeshi pre-service teachers at the end of their education, Ahsan, Sharma, and Deppeler (2012) used the TEIP to assess levels of self-efficacy for teaching within inclusive classrooms. Results their study showed that males generally feeling more confident for teaching in inclusive classrooms.

Panel Intended to Teach

The panel that pre-service teachers are preparing to teach also appears to be associated with their self-efficacy for teaching within inclusive classrooms. In Canada, Specht et al. (2016)

reported that pre-service teachers who were planning to teach elementary grades scored higher on the Collaboration subscale of the TEIP compared to secondary school pre-service teachers. Furthermore, Specht and Metsala (2018) reported differences in efficacy between elementary and secondary pre-service teachers. Pre-service teachers who were planning to teach elementary grades scored higher on the Collaboration and Managing behaviour factors TEIP when compared to those planning to teach secondary grades.

Internationally, Scheer, Sholz, Rank and Donie (2015) used a case-based measure of self-efficacy to determine differences in self-efficacy between a large sample of elementary and secondary pre-service teachers. Each case described a different student and contained statements about teaching and learning that the participants then rated based upon how much they agreed with that statement. Results of the study concluded that pre-service teachers planning to teach elementary grades felt significantly more confident in their abilities to teach in inclusive classrooms compared to their secondary counterparts.

An explanation offered for this result was the differences in the way that elementary and secondary classes are structured. In the elementary grades, a teacher has the same group of students all day each day and is responsible for teaching every subject, whereas secondary teachers are only responsible for teaching their particular subject. This may result in secondary teachers believing that their sole job is to transmit knowledge of the subject with little regard to students who have difficulty learning in such a classroom (Specht et al. 2016). This kind of teaching systematically filters out students with diverse learning needs, as those who cannot succeed are streamed out of those classes and into different ones. This results in secondary classrooms being much more homogeneous with regards to student ability, which may subsequently result in pre-service teachers having fewer interactions with diverse learners. As

previously mentioned, experience with diverse populations is directly related to self-efficacy for teaching in inclusive classrooms, and the homogeneity of ability in secondary classes may explain why secondary pre-service teachers feel less confident in their abilities (Scheer, Sholz, Rank & Donie, 2015).

The level of experience that a pre-service teacher has, their gender, and the panel that they are studying to teach have all been shown to influence his or her self-efficacy for teaching in an inclusive classroom. Those with more experiences with diverse populations tend to feel more confident in their abilities to teach in inclusive classrooms. In Canada, as well as internationally, male pre-service teachers feel more confident in their abilities to manage student behaviour, and teachers studying to teach elementary grades feel more confident in their abilities to collaborate within inclusive classrooms.

Beliefs About How Students Learn

In addition to how confident a teacher feels at teaching in an inclusive classroom, their beliefs regarding how children with diverse learning needs learn can significantly impact the quality of instruction that they provide and the way that a student internalizes their own abilities (Monsen, Ewing, & Kwoka, 2014; Woodcock, 2014). Recent research investigating teacher beliefs toward inclusion have defined beliefs across a spectrum, ranging from Pathognomonic to Interventionist (Jordan, 2018). Teachers who adopt a pathognomonic belief toward disability believe that a student's disability is a stable, pathological state unlikely to be modified through the use of instruction or adaptations (Jordan, 2018). Teachers with a pathognomonic belief are more likely to express sympathy toward a student with a disability, provide generous feedback on failed tasks, and are less likely to express frustration when a student with a disability does not put effort into schoolwork (Avaramidis, Bayliss, & Burden, 2000; Woodcock, 2014; Woolfson &

Brady, 2009). While sympathy and patience appear to be positive characteristics, they can be detrimental to the confidence of learners. When a teacher expresses sympathy when a student with a disability fails a task, or provides false praise, they are conveying to the student that they do not hold that student up to the same expectations as their peers. They are perpetuating the notion that it is the child's disability, not the amount of effort put forward that resulted in the failure. This leads to the child internalizing the idea that they are of low ability, and are unlikely to improve (Woodcock, 2014).

Conversely, teachers who adopt an interventionist perspective believe that disability is the result of barriers which can be removed to provide all students with a rich learning experience (Jordan, 2018). These teachers are more likely to express superficially negative characteristics such as a lack of sympathy for failed work and frustration with students. However, the expression of these characteristics is a result of the teacher holding all students to a high standard and believing that each student has the ability to learn. Teachers who adopt an interventionist perspective are more likely to praise effort over ability and will express frustration with any student who they believe is not reaching their full potential (Glenn, 2018; Woodcock & Jiang, 2018; Woodcock 2014). This leads to all students internalizing the belief that they can all succeed, and that disability is something which can be overcome.

As teacher beliefs have a significant impact on the learning environment, methods of measuring beliefs have been of interest to educational researchers. One such measure is the Beliefs about Teaching and Learning Questionnaire (BLTQ) (Glenn, 2018). The BLTQ has been used to quantitatively assess teacher beliefs toward inclusive education in several large-scale studies (Friesen & Cunning, 2018; Specht & Metsala, 2018, Specht et al., 2016) and measures

Pathognomonic and Interventionist beliefs across four factors: Entity-Increment, Teacher Controlled Instruction, Student-Centred Instruction, and Attaining Standards.

Teachers who adopt an Entity perspective believe that students' academic ability is a fixed, stable trait unlikely to change regardless of the amount of effort put forward (Glenn, 2018). Stipek, Givven, Salmon, & McGyvers (2001) showed that mathematics teachers with such a perspective are more likely to try and control students' behaviour, are less satisfied with teaching, and were less confident in their abilities compared to teachers who adopted an Increment perspective. A teacher with Increment beliefs believes that ability is not necessarily inherent to the individual. Rather, they believe that ability can be modified through student effort, effective instruction, and the removal of potential barriers to learning (Glenn, 2018).

The Teacher Controlled Instruction factor represents teachers' beliefs toward the role he or she should have in the classroom with regards to student learning. A teacher with more Teacher Controlled beliefs subscribes to the idea that he or she should be in control of his or her student's learning, and that the teacher's primary role within the classroom is to transmit knowledge. Conversely, the Student-Centred spectrum represents how involved teachers feel students should be in the learning process. A teacher with more Student-Centred beliefs believes that students should be actively involved in the learning process, and that the teacher's role is less of a transmitter of knowledge, and more of a guide to assist student learning in whatever way works best for the student. The final factor is Attaining Standards, and represents teachers' beliefs toward the use of extrinsic rewards to foster students` motivation to learn. A teacher who scores highly on this factor is more likely to place emphasis on grades or other external rewards in order to motivate students to reach expectations (Glenn, 2018).

Depending on where a teacher places on each spectrum of beliefs appears to have a significant impact on their self-efficacy for teaching. In a UK study, Avarmidis, Bayliss, and Burden (2000) sought to investigate pre-service teachers' attitudes and beliefs toward the general concept of inclusion, what variables may influence beliefs, and how beliefs relate to pre-service teachers' sense of confidence for teaching. Using Likert scales specifically developed for that study, they concluded that inclusion-oriented beliefs and attitudes were positively correlated with pre-service teachers' general sense of efficacy for teaching. However, despite holding positive beliefs toward the concept of inclusion, participants in Avarmidis, Bayliss, and Burden's (2000) study reported feeling less confident at teaching students with more severe emotional and behavioural difficulties. Similar to Avarmidis, Bayliss, and Burden (2000), Woolfson and Brady (2009) identified significant relationships between a teacher's beliefs toward inclusive education and their self-efficacy. Results of their study indicated that teachers who viewed that learning difficulties were the result of poor instruction or an incompatible learning environment had higher levels of self-efficacy for teaching. Furthermore, Monsen, Ewing, and Kwoka (2014) reported that teachers who feel supported in their roles as teachers and are confident in collaborating with fellow teachers are more likely to hold positive attitudes and beliefs toward inclusion.

In summary, the beliefs that a pre-service teacher holds regarding inclusion are related to his or her sense of self-efficacy. Beliefs toward inclusion range from Pathognomonic to Interventionist, with Pathognomonic beliefs representing the idea that ability is fixed and unchanging, and Interventionist beliefs representing the notion that ability is flexible and can be changed through instruction and environmental modifications. Teachers who adopt a Pathognomonic perspective are less supportive of inclusion and have been shown to be less

confident in their abilities to teach within an inclusive classroom. Conversely, teachers who adopt an Interventionist perspective are more supportive of inclusion, and are subsequently more confident in their abilities to teach within inclusive classrooms.

Conclusion and Statement of the Problem

Many studies have investigated how demographic and experiential variables, as well as beliefs can influence a pre-service teacher's sense of self-efficacy for teaching in an inclusive classroom. In general, male teachers report feeling more confident than their female counterparts at managing student behaviour. Teachers who have more personal and professional experience with people with exceptionalities are more confident. Pre-service teachers studying to be elementary school teachers are more confident in their abilities to collaborate and use inclusive instruction when compared to those studying to become high school teachers. Teachers who hold Student-Centred Interventionist beliefs toward teaching and learning are more confident in their abilities to use inclusive instruction. To date, only one study investigated the extent to which pre-service teachers' self-efficacy for inclusive teaching could be predicted from demographics, experiences, and beliefs (Specht & Metsala, 2018). Specht and Metsala (2018) used data from demographic questionnaires and the Beliefs about Teaching and Learning Questionnaire (BLTQ) to predict TEIP scores of 1026 Canadian pre-service teachers at the end of their teacher education. The demographic characteristics investigated were gender, age, panel intended to teach, if participants had friends or coworkers who have a disability, and level of experience with students with exceptionalities and were collected toward the end of participants' teacher education programs. Results of the study indicated that participants who had friends with a disability and had more experience teaching students with exceptionalities felt more confident in their abilities to collaborate, to manage student behaviour, and to use inclusive instructional

practices within their classroom. Furthermore, inclusion-related beliefs predicted teacher's efficacy for collaboration depending on what program the teachers were studying to teach. Pre-service elementary teachers who held student-centred beliefs, and who see students as motivated by grades, and pre-service secondary teachers who adopted an interventionist perspective to learning felt more confident in their abilities to collaborate. A similar trend was observed with regards to confidence for managing behaviour. Student-centred beliefs predicted the use of inclusive instruction for both elementary and secondary pre-service teachers.

The purpose of this study was to build off of the foundation laid by Specht and Metsala (2018) by using data collected before participants took their first course on inclusive education as well as toward the end of their teacher education, and using the data from both points in time to predict self-efficacy scores. Furthermore, predictors at both points in time were compared to one another to see how they changed over the course of pre-service teachers' education. Factors explored were pre-service teachers' gender, the panel they were studying to teach, level of experience with diverse populations, time spent teaching in diverse classrooms, and beliefs held toward inclusive education. As teachers with low levels of self-efficacy are at a significantly higher risk for burning out and leaving the profession (Woolfolk-Hoy & Spero, 2005), it is important that teacher candidates graduate their education programs with high levels of self-efficacy for teaching in inclusive classrooms. If it is possible to predict self-efficacy levels early on from variables collected toward the beginning of teacher education programs, teacher education programs can isolate the variables that contribute to the higher levels of self-efficacy and implement them throughout the program, so that all teachers have the best chance at graduating with a high level of self-efficacy.

Research Question

The study was guided by the following research questions:

1: Is there a significant change in pre-service teachers' self-efficacy and beliefs in inclusive education between the beginning and toward the end of their teacher education programs?

2: To what extent can the different factors of self-efficacy for teaching in inclusive classrooms at time of program completion be predicted from gender, level of personal experience with diverse learners, level of professional experience with diverse learners, the panel pre-service teacher is intending to teach, and level of experience teaching in a diverse setting at the beginning and toward the end of a teacher education program.

3: To what extent can self-efficacy for teaching in an inclusive classroom at the time of program completion be predicted from the level of change in beliefs toward inclusion?

Methodology

Research Design

To address the research questions, this study used a pre-test post-test quantitative method using surveys to determine how levels of self-efficacy at the time of program completion can be predicted from demographic variables, beliefs, and the levels of self-efficacy at the beginning teacher education programs. The following section will describe the participants in this study, provide an overview of the instruments used, and describe the methods of analyses.

Participants

Participants in this study were 264 teacher candidates from 11 Faculties of Education across Canada. All data were obtained from an ongoing study investigating the development of inclusive practices of pre-service teachers conduced by the Canadian Research Centre on Inclusive Education. Before participants completed their first course on inclusive education, and again toward the end of their teacher education, participants completed a demographic questionnaire indicating their gender, the panel they intended to teach, level of personal and professional experience with diverse populations, and how many days they have spent teaching in an inclusive classroom. For the list of items included in the demographic questionnaire, see Appendix A Level of personal and professional experience were measured using a 4-point Likert scale ranging from no experience to extensive experience. Days spent teaching in a diverse classroom was measured categorically, with the categories being no experience, 1 to 30 days experience, and greater than 30 days experience. The sample consisted of 218 female teacher candidates and 46 male teacher candidates. The average age of participants was 26 years and ranged from 24 to 53 One hundred and twenty-seven candidates indicated that they intended to teach elementary school, and 100 indicated that they intended to teach secondary school. Thirty-

eight candidates indicated that they intended to teach both elementary and secondary school or made no indication that they wanted to teach any grade. In continuing with the theme of past research investigating differences between elementary and secondary pre-service teachers (Specht & Metsala, 2018; Specht et al., 2016; Scheer, Scholz, Rank, & Donie, 2015), distinct groups of elementary and secondary pre-service teachers were desired. As a result, participants who indicated that they were studying to teach both elementary and secondary or did not indicate studying for any grade were excluded from all analyses.

At the beginning of their education, very few (5.0%) participants reported having no personal experience with diverse populations. 39.1% and 37.5% reported having little and moderate amounts of personal experience respectively, with a final 18.4% reporting having extensive personal experience. Toward the end of their education, 3.8% of participants remained having no personal experience with diverse populations. 34.5% reported little personal experience, 43.7% reported moderate experience, and 18.0% reported extensive experience.

Similarly, few participants (6.9%) reported having no professional experience with diverse populations toward the beginning of their education. 37.8% indicated little professional experience, 42.7% indicated moderate professional experience, and 12.6% reported extensive experience. Toward the end of their education, only 0.4% of participants and 16.3% of participants reported having no and little professional experience with diverse populations respectively. 57.2% reported having moderate professional experience, and 26.1% reported extensive professional experience.

Toward the end of their education, only 0.8% of participants indicated that they did not have any diverse teaching experience. 19.7% reported having 0-30 days of experience, and the large majority (79.5%) indicated having at least 30 days of diverse teaching experience.

Instrumentation

Teacher Efficacy for Inclusive Practices Scale

Self-efficacy for teaching within inclusive classrooms was measured using the TEIP scale (Sharma, Loreman, & Forlin, 2012). The TEIP is an 18 item self-report questionnaire that is designed to measure teacher efficacy across three factors. For a full list of items, see Appendix B. All items were measured on a 6-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (6). Sharma, Loreman, and Forlin (2012) selected this range as to eliminate the possibility of a neutral response. Each factor contains six items and are scored based on the mean of those six items, leading to a maximum possible score of 6 with higher score indicates a higher level of self-efficacy for that factor. Psychometric properties of this scale were evaluated using an international sample of teachers from Canada, Hong Kong, and Australia. Results of this evaluation found that the factors of the scale indicate a good level of internal consistency with efficacy to use inclusive instruction, efficacy in collaboration, and efficacy in managing behaviour receiving Cronbach's alpha scores of 0.93, 0.85, and 0.85 respectively, with a combined alpha score of 0.89. The faculty members from six universities across Canada, Australia, India, and Hong Kong were employed to assess the validity of the items included in the scale. Faculty members rated each item on a scale of one to five, with one indicating that the item hardly matters to pre-service teacher's efficacy to implement inclusive practices and five indicating that the item definitely measures pre-service teacher's efficacy to implement inclusive practices. Based on the collaboration and evaluation between faculties, the 18 items included within the scale were found to be a valid measure of teachers' self-efficacy for teaching within an inclusive classroom (Sharma, Loreman, & Forlin, 2012). The psychometric properties of the TEIP scale were further validated by Park, Dimitrov, Das, and Gichuru (2016). The results of

this study confirmed that the TEIP scale is unidimensional, indicating that the factor of teacher efficacy is the only dominant factor that the scores on the TEIP measure. The results also determined that the three latent factors of efficacy for inclusive instruction, efficacy for collaboration, and efficacy for managing behaviour represented specific aspects of the unidimensional factor of teacher efficacy.

Beliefs about Teaching and Learning Questionnaire

The BLTQ is a 20 item self-report measure that assesses teachers' beliefs about ability and disability. See Appendix C for a full list of items. The BLTQ uses a six-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (6). Psychometric properties of the BLTQ were evaluated by Glen (2018) using a sample of 120 pre-service and 66 in-service teachers in an Ontario school board. Results of this evaluation determined that all four factors possess adequate internal consistency with the factors of Teacher-Controlled, Entity-Increment, Student-Centred, and Attaining Standards receiving Cronbach Alpha scores of .71, .63, .64, and .71 respectively. Furthermore, the psychometric properties of the BLTQ were reviewed in a large study consisting of 1490 Canadian pre-service teachers (Specht et al., 2016). Results determined Alpha scores of .66, .73, .64, and .70 for Student Centred, Entity-Increment, Teacher Controlled, and Attaining Standards respectively.

Procedure

Participants first completed a pen-and-paper copy of the demographic questionnaire, the TEIP and the BLTQ, which were distributed in-class during their first course on inclusion in their teacher education programs. Participation in this study was not mandatory and did not have an impact on any outcomes of the course. Participants indicated if they wished to continue

participating in the study on the pen-and-paper measure. If so, they were given unique anonymous ID numbers and the results of their surveys were input into a database. Participants who indicated an interest to continue were sent an online version of all questionnaires toward the end of their teacher education.

Results

To address the first research question of if there is a difference between self-efficacy toward the beginning and toward the end of teacher education programs, a series of Wilcoxon Signed-Rank tests were used. This test was selected in lieu of the paired-samples t-test, as the distribution of scores violated the t-test assumption of normality (Cohen, Manion, & Morrison, 2017). The results of the analyses demonstrated that there was a significant increase in efficacy for Managing Behaviour between time 1 (M=4.15, SD= .63) and time 2 (M=4.33, SD= .64) p<.001, efficacy for the use of inclusive instruction between time 1 (M=4.61, SD=.54) and time 2 (M=4.77, SD =.52) p<.001, a significant increase in Student-Centred beliefs between time 1 (M=4.74, SD =.57) and time 2 (M=4.86, SD =.58) p<.001, and a significant difference in Entity-Increment beliefs at time 1 (M=5.29, SD=.68) and time 2 (M=5.22, SD=.70) p=.02. No significant differences were found between time 1 and time 2 of efficacy for collaboration, Attain Standards beliefs, or Teacher Controlled beliefs.

To address the second research question of how self-efficacy at the time of program completion can be predicted from demographic, experiential, and belief variables, a series of multiple regression analyses were used. For each sub-scale of the TEIP, two regression analyses were run using data collected at the beginning of a teacher education program, and data collected toward the end of a teacher education program.

Prior to each regression analysis, all relevant assumptions were tested. Firstly, data included in all analyses were continuous, or were categorical variables with only two levels. Linearity of the relationship between all predictor variables and the criterion variable was assessed by observing partial regression plots. No obvious non-linear relationships between all

predictor variables and all criterion variables were observed, satisfying the assumption of linearity between predictors and the criterion.

A correlation matrix determined that none of the independent variables included in any regression analysis were highly correlated with one another. Furthermore, collinearity diagnostics indicated that all Tolerance and Variance Inflation Factors were below threshold. Correlation matrices are reported in Tables 7, 8, and 9. For all analyses, multivariate outliers were detected using Mahalanobis Distance set at the critical alpha value of .01, with a critical *MD* value of *MD*=21.67, *df*=9. For all analyses, the assumption of the normality of residuals was tested using the Kolmogorov-Smirnov test of normality. See Appendix D for all normality tests.

For the first set of regression analyses, TEIP Use of Inclusive Instruction scores was used as the dependent variable. Predictors were participants' gender, the panel intended to teach, level of professional diverse experience, level of personal diverse experience, level of diverse teaching experience, Entity-Increment beliefs, Teacher Controlled beliefs, Attain Standards beliefs, and Student Centred beliefs. Results of the Time 1 regression analysis showed that the regression model significantly predicted Use of Inclusive Instruction scores and accounted for 11% of the total variance (R^2=.11, F (9, 197) = 2.57, p=.01). Significant predictors in this model were Entity-Increment beliefs (β = .148, sr^2=.03 p=.01) and Student-Centred beliefs (β = .192, sr^2=.04, p<.01). After using variables from Time 2, the regression model again predicted Use of Inclusive Instruction scores and accounted for 25% of the total variance, (R^2=.25, F (9, 206) =7.56, p<.01). Significant predictors in this model were Professional Diverse Experience (β=.127, sr^2=.02, p=.016), Personal Diverse Experience (β=.116, sr^2=.03, p=.01), Entity-Increment beliefs (β=.180. sr^2=.05, p<.01) and Student Centred beliefs (β=.186, sr^2=.04, p=.<.01).

For the second set of regression analyses, TEIP Collaboration was used as the dependent variable. At time 1, the model significantly predicted Collaboration scores and accounted for 9% of the total variance (R^2=.09, F (9, 197) = 2.1, p=.03). The only significant predictor in this model was the panel intended to teach (β=-218, sr^2=.02, p=.02), with participants preparing to teach elementary grades reporting higher levels of efficacy for collaboration. At time 2, the model significantly predicted Collaboration scores and accounted for 22% of the total variance (R^2=.22, F (9, 206) = 6.55**,** p<.01). Significant predictors were the panel intended to teach (β= -.206, sr^2=.03, p=.01), professional diverse experience (β=.153, sr^2 =.02, p=.01), personal diverse experience (β= .150, sr^2=.03, p=<0.01) and Student Centred beliefs (β=.157, sr^2=.138, p=.03).

The third set of regression analyses used TEIP Managing Behaviour as the dependent variable. At time 1 the model significantly predicted Managing Behaviour scores and accounted for 16% of the total variance (R^2=.16, F (9, 197) = 4.25, p<.01). The only significant predictor was professional diverse experience (β=.172, sr^2=.03, p=.01). At time 2, the model continued to significantly predict Managing Behaviour scores, and accounted for 21% of the total variance (R^2=.021, F (9, 206). Significant predictors were professional diverse experience (β=.196, sr^2=.04, p<.01), personal diverse experience (β=.142, sr^2=.03, p=.01), and Entity-Increment beliefs (β=.168, sr^2=.03 p=.01).

To address the third and final research question, a series of multiple regression analyses were used to determine how efficacy at the time of program completion can be predicted from the change in beliefs over time. The first regression analysis used TEIP Inclusive Instruction scores as the dependent variable, and the change in Attain Standards, Student Centred, Entity Increment, and Teacher Controlled beliefs from time one to time two as the independent variables. The model significantly predicted Inclusive instruction scores, however only 4% of the

total variance was accounted for (R^2=.04, F (4, 235) = 2.5, p=.04). No significant individual predictors were present. The second regression analysis used TEIP Collaboration scores as the dependent variable. The model significantly predicted Collaboration scores, however similar to the previous analysis, the variance accounted for was very small (R^2=.055, F (4, 235) = 3.43, p=.01) The only significant predictor was Teacher Controlled beliefs (β= -.141, sr^2=.01, p=.02), with a decrease in Teacher Controlled beliefs predicting an increase in Collaboration. The final regression analysis used TEIP Managing Behaviour scores as the dependent variable. The model failed to significantly predict Managing Behaviour scores (R^2=.03, F (4, 234) = 1.83, p= .124).

Discussion

The present study investigated if self-efficacy and beliefs toward inclusive teaching and learning of Canadian pre-service teachers changed during their time in teacher education and the extent to which self-efficacy at the time of program completion could be predicted from beliefs, demographic, and experiential variables at the beginning and end of their programs. The first goal of the study was to determine if beliefs and self-efficacy of pre-service teachers change during their teacher education programs. At both the beginning and end of their education, Canadian pre-service teachers report feeling confident in their abilities across all three factors of the TEIP and hold very strong positive beliefs toward inclusion. This finding is in accordance with past research investigating Canadian pre-service teacher's self-efficacy and beliefs (Freisen & Cunning, 2018; Specht & Metsala, 2018; Specht et al., 2016). Due to participants' beliefs and self-efficacy being so skewed toward the positive end and having such little variance, non-parametric tests were required to determine any differences between time one and time two.

Past research has demonstrated that age is a significant predictor of pro-inclusion beliefs. Younger pre-service teachers are significantly more likely to hold pro-inclusion beliefs compared to older pre-service teachers (Avramidis, Bayliss, & Burden, 2000). This may be as a result of the younger generation of teachers growing up and being educated within inclusive environments, whereas inclusion may not have been as prominent with the older generation. The average age of participants at time one was 26, which may partially explain why beliefs and self-efficacy for teaching in inclusive classrooms was so high. Data so skewed presents issues for meaningful analyses, however such a skew in this direction is welcomed as it indicates that Canadian pre-service teachers are entering and graduating from teacher education programs with very strong pro-inclusion beliefs and high levels of self-efficacy for teaching within inclusive classrooms.

Despite positively skewed data and little variance between times, statistically significant improvements were found with regards to pre-service teachers' efficacy for Managing Behaviour and use of Inclusive Instruction. These changes are likely attributable to the increase in experience in working with and learning about diverse populations. Toward the beginning of their teacher education programs, almost half of all participants indicated that they had little or no professional experience working with diverse populations. At the time of program completion, one-sixth of participants remained at those levels. Pre-service teaches who gained professional experience likely had opportunities to implement inclusive instruction and chances to practice managing student behaviour within their practicum settings. These opportunities would allow for mastery experiences, the chance for vicarious experiences by observing a mentor teacher teaching successfully, and potential feedback from the mentor teacher. All of these factors have been demonstrated to be contributors to self-efficacy, resulting in a subsequent increase. Interestingly, no significant changes were observed for efficacy in Collaboration. This may be the result of ceiling effects, in that efficacy to collaborate was high at both points in time resulting in no statistically significant differences between the two. Alternatively, this may be the result of teacher education programs not explicitly teaching pre-service teachers' collaboration skills or providing them with opportunities to practice collaboration. Further investigation into the extent to which collaboration is taught is required, however despite no significant changes Collaboration scores were relatively high at both points in time.

Significant increases were observed in Student-Centred beliefs. Toward the end of their education programs, pre-service teachers held stronger beliefs that the role of a teacher is to be a flexible facilitator of student learning, as opposed to a rigid transmitter of information. This change in belief likely stems from coursework taken regarding differentiated instruction

instruction and multi-modal forms of evaluation. A component of inclusive education coursework taught in the faculties of education included in this study follows the concept of Universal Design for Learning, which advocates for multimodal forms of instruction and evaluation that allows lessons to be planned to meet the educational needs of all students (Stolarchuck, Baker, & Cobb, 2013). These courses likely highlighted the benefits of differentiated instruction, leading to the change in Student-Centred beliefs. However, despite being statistically significant, the overall change between the two times was small. A significant decrease was observed in Entity-Increment beliefs, indicating that teachers held fewer positive beliefs toward the malleability of ability and the control students have over disability. However, these results must be interpreted carefully as Entity-Increment beliefs were already approaching the maximum possible score at the beginning of the program and at the end of the program and the difference between times, although statistically significant, was very small. No significant differences were observed in either the Attain Standards or the Teacher Controlled factor. The small changes observed in the Student-Centred and Entity-Increment factors and the lack of change in the Attain Standards or Teacher Controlled factors may be explained by the nature of beliefs and how they form. Once established, beliefs are thought to be very difficult to change (Jordan, 2018). The beliefs that pre-service teachers hold toward teaching and learning may have been formed in their previous post-secondary education, in high school, or even elementary school. Despite the apparent rigidity of beliefs, Canadian pre-service teachers are coming into and leaving teacher education programs with very positive beliefs toward inclusive education.

The second goal of this study was to identify possible predictors of self-efficacy at the time of program completion from data collected at the beginning and end of teacher education programs. Predictors included pre-service teachers' gender, the panel they were intending to

teach, level of personal and professional experience with diverse populations, level of experience teaching diverse populations, and their beliefs toward teaching and learning.

Predictors of Efficacy for use of Inclusive Instruction

At the beginning of teacher education programs, having stronger Entity-Increment and Student-Centred beliefs significantly predicted efficacy for use of Inclusive Instruction. A higher score on the Entity-Increment scale indicates a stronger belief that ability is a malleable trait which can be modified through instruction and effort (Jordan, 2018). It is understandable that those who believe that ability is malleable are more confident in their abilities to use inclusive instruction, as a significant portion of inclusive instruction is forward planning of lessons so that they are accessible by all students (Stolarchuck, Baker, & Cobb, 2013). At this point in time, pre-service teachers' gender, panel intended to teach, level of personal and professional experience with diverse populations, and level of diverse teaching experience were not significant predictors.

Toward the end of teacher education programs however, the level of personal experience and the level of professional experience with diverse populations became significant predictors for Efficacy for use of Inclusive Instruction. This result is interesting, as even though many participants entered teacher education programs with moderate to extensive levels of personal and professional experience with diverse populations, experience only became a significant predictor toward the end of the teacher education programs. This indicates that teacher education programs are not only providing pre-service teachers with more opportunities for experience with diverse populations, they are teaching skills that pre-service teachers are using to translate

their personal and professional experiences into confidence for teaching within inclusive classrooms.

Pre-service teachers' gender and the amount of diverse teaching experience that pre-service teachers had did not significantly predict Efficacy for use of Inclusive Instruction at either point in time. This is an interesting finding, as the overwhelming majority of participants reported having at least 30 days of diverse teaching experience toward the end of their education. However, as indicated in Lancaster and Bain (2010), practical experience teaching within an inclusive setting may not uniquely contribute to levels of self-efficacy if the practical experiences are coupled with a comprehensive inclusive education course. As Canadian faculties of education are graduating teachers with a very high sense of self-efficacy for teaching within inclusive classrooms, it is a safe assumption that the courses offered on inclusive education are comprehensive and of high quality. The quality of classes may undermine the practical component with regards to learning about using inclusive instruction, which may partially explain why diverse teaching experience did not significantly predict levels of self-efficacy, however further evaluation of inclusive education courses offered at Canadian faculties of education is required in order to substantiate this explanation.

Predictors of Efficacy for Managing Behaviour

Toward the beginning of the teacher education programs, the level of Professional Diverse Experience was the only significant predictor of efficacy for Managing behaviour. Pre-service teachers who reported more professional experience felt more confident at managing behaviour in inclusive classrooms. As direct experience with diverse populations has been shown to be a powerful contributor to the development of self-efficacy for teaching within inclusive

classrooms, it is understandable that participants who have more experience working with diverse populations in a professional setting would feel more efficacious at managing behaviour within a professional classroom setting. Students entering faculties of education may have had opportunities to practice managing behaviour in past professional non-educational contexts, such as working as a camp counsellor. This kind of professional experience may translate well into managing behaviour within inclusive classrooms.

At time 2, several previously nonsignificant predictors gained significance. The panel that pre-service teachers were studying to teach, personal experience with diverse populations, and Entity-Increment beliefs all became significant predictors of Efficacy for Managing Behaviour. The level of professional diverse experience remained a significant predictor.

Personal experience becoming a significant predictor and professional experience remaining a significant predictor can be explained by the skills and the opportunities provided within teacher education programs. As previously mentioned, experience is a significant contributor to the development of self-efficacy. However, experiences alone do not necessarily lead to increases in self-efficacy. The way that experiences are interpreted and cognitively assessed can impact self-efficacy (Bandura, 1997). Teacher education programs may have provided pre-service teachers with the tools to cognitively reassess their past interactions with diverse learners in such a way that contributes to a sense of self-efficacy.

Panel only became a significant predictor for Efficacy for Managing Behaviour toward the end of pre-service teachers' time in faculties of education. This result is in accordance with past literature, which indicates that pre-service teachers studying to teach elementary grades have generally higher levels of self-efficacy than those training to teach secondary grades (Scheer, Sholz, Rank & Donie, 2015). This result may be explained by the inherent differences in the

structure and setup of elementary and secondary classrooms, and the subsequent differences in practical experiences pre-service teachers would receive. As previously mentioned, elementary classrooms tend to be much more inclusive and much more diverse than secondary classrooms (Scheer, Sholz, Rank & Donie, 2015; Specht et al., 2016). This diversity coupled with the fact that elementary teachers are with the same students all day each day, means that pre-service elementary teachers likely had much more opportunities to practice behaviour management techniques when compared to pre-service secondary teachers. Teacher education programs should try and maximize the opportunities to practice managing behaviour for pre-service teachers' studying to become secondary teachers. This may include additional classes or workshops on the topic, or a placement within an elementary context in order to gain early experience managing behaviour within an inclusive setting.

With regards to beliefs, Entity-Increment became a significant predictor. Pre-service teachers with higher levels of Entity-Increment beliefs at the end of their teacher education report more confidence at managing behaviour. This result may be explained by the courses taken by pre-service teachers. A large component of inclusive education coursework is the idea of Universal Design for Learning, which states that all students can learn if they are provided with the tools that they need to succeed (Stolarchuck, Baker, & Cobb, 2013). The idea that a students' learning can be assisted through proper planning of instruction and environment may translate to a similar view regarding the malleability of behaviour. If a teacher believes that behavior is not a product of the student, but rather is the result of learning and the environment, they may be more confident in their abilities to manage behaviour because they know it can be changed through instruction and accommodations.

Predictors of Efficacy for Collaboration

At the beginning of the program, the only significant predictors for efficacy for Collaboration was panel, with elementary trainees feeling significantly more confident in their abilities to collaborate. This result is consistent with existing literature which has found that elementary pre-service teachers tend to be more confident in their abilities to collaborate compared to those studying to become secondary teachers (Specht & Metsala, 2018; Specht et al., 2016). As participants at this point in time have not completed any coursework surrounding inclusive education, it is interesting to observe that there are already differences in self-efficacy for collaboration between pre-service teachers studying to teach elementary and secondary grades. This may stem from expectations about elementary and secondary grades held by pre-service teachers before they start their education. Past research has suggested that differences in self-efficacy between elementary and secondary pre-service teachers may stem from perceptions of the teachers' responsibility for student success (Scheer, Sholz, Rank & Donie, 2015). Elementary classrooms are much more diverse than high school classrooms, and elementary teachers are responsible for teaching every aspect of every subject within their classrooms. As elementary teachers are responsible for teaching most subjects, they may have more opportunities for collaboration with one another, as no one teacher is responsible for one particular subject. Conversely, secondary classrooms are much more homogenous with regards to student ability, and high school teachers are only responsible for teaching their particular subject to potentially multiple classes of different students daily. This dilution of responsibility coupled with potentially few faculty members who teach the same subject may lead for fewer opportunities to collaborate, resulting in lower self-efficacy for collaboration (Scheer, Sholz, Rank & Donie, 2015; Specht et al., 2016).

Toward the end of teacher education, panel intended to teach remained a significant predictor. Interestingly, both personal and professional experience with diverse populations became significant predictors despite no statistically significant differences in pre-service teachers' Efficacy to Collaborate between time 1 and time 2. This indicates that although teacher education programs may not be explicitly teaching pre-service teachers how to collaborate, they are providing pre-service teachers with the ability to incorporate their personal and professional experiences into their sense of self-efficacy for collaboration. Teacher education programs should look into the instruction they provide regarding collaboration, and the opportunities given to pre-service to practice collaborating with one another.

Predicting Efficacy from Changes in Beliefs

The change in pre-service teachers' beliefs toward teaching and learning between time one and time two were also used to predict self-efficacy scores at the time of program completion. Once established, beliefs are thought to be very difficult to change (Jordan, 2018), and this notion was reinforced by the results of this study. There was very little change in beliefs of pre-service teachers between the beginning and the end of their teacher education, indicating that the majority of their beliefs were acquired before entering the program. However, no study has investigated how changes in pre-service teachers' beliefs over time predict self-efficacy scores at the time of their program completion, so the analyses were carried forward regardless of the small differences between times.

For Efficacy for use of Inclusive Instruction, no change in beliefs significantly predicted efficacy levels. For Collaboration, the change in Teacher-Controlled beliefs significantly predicted efficacy for collaboration, with a decrease in Teacher Controlled beliefs predicting an increase in efficacy for Collaboration. As previously mentioned, Teacher Controlled refers to the

role that teachers believe that they should play with regard to classroom instruction. Teachers who score low on this factor believe that teachers should be less of a transmitter of knowledge, and more of a learning facilitator, allowing for students to learn in ways that work best for them. It is understandable that pre-service teachers who are open to providing instruction meet the needs of all students would be more efficacious in collaboration, as collaboration is required to make such a learning environment possible. Finally, for Efficacy for Managing Behaviour, the only significant predictor once again was the change in Teacher-Controlled beliefs, with a decrease in such beliefs predicting an increase in efficacy toward managing behaviour. Despite Canadian pre-service teachers having strong pro-inclusion beliefs both coming into and graduating from teacher education programs, such programs should continue to focus on promoting pro-inclusion beliefs. Teachers who believe that they should not be in control of all aspects of the learning process are more confident in their abilities to collaborate, as well as manage behaviour.

Implications for Teacher Education Programs

The results of this study demonstrate that pre-service teachers' sense of self-efficacy for using inclusive instruction and managing student behaviour in inclusive classrooms significantly increases during their time in teacher education programs, and the most significant contributor to self-efficacy at the time of program completion is personal and professional experience with diverse learners. The level of personal and professional experience that pre-service teachers had were significant predictors for all three factors related to self-efficacy for teaching within inclusive classrooms. Interestingly, many pre-service teachers had both personal and professional experience with diverse populations toward the beginning of their teacher education program, however these experiences did not predict self-efficacy at the time of program completion. This

suggests that pre-service teachers were able to cognitively reassess past experiences, and translate those experiences into new self-efficacy information. Teacher education programs should continue to provide pre-service teachers with as many opportunities as possible to gain personal and professional experience with diverse populations. This is especially true for teachers studying to teach secondary grades. Results of this study and past literature suggest that secondary teachers have lower levels of self-efficacy for managing behaviour and for collaboration, and this likely stems from a lack of experience with diverse populations. Having more meaningful experiences, opportunities to collaborate, and practice managing behaviour may increase the self-efficacy of pre-service high school teachers in those particular areas.

Limitations

The first limitation of this study was the response rate. Despite a relatively large sample size of 264 pre-service teachers, the total sample of participants who completed the measures at time one was 2636. Due to such a large difference between those who filled out time one and time two, there may be systematic differences between those populations. Participants willing to fill out the surveys a second time may have been those with the most positive inclusive beliefs or the most self-efficacious of the total sample. Secondly, the way in which data was collected limited the analyses that could be done. The variables regarding experience with diverse populations was measured categorically, meaning that changes in experience with over time could not be tracked. Finally, the reported self-efficacy and pro-inclusive beliefs of the participants were so high at both points in time that it was difficult to identify significant changes between times. Despite presenting a challenge for statistical analyses, having pre-service teachers with very high self-efficacy and strong pro-inclusion beliefs is great for the future of education.

Suggestions for Future Research

Future research into the predictors of self-efficacy for inclusive teaching should measure experience with diverse populations on a continuous scale. This will allow for difference scores to be included within a regression analysis and will allow for prediction of self-efficacy from changes in exposure to diverse populations. Furthermore, ratings on how coursework influences efficacy should be included, as inclusive education courses have been demonstrated to impact self-efficacy (Sokal & Sharma, 2017; Sharma & Sokal, 2015). Secondly, the use of interviews to supplement quantitative self-efficacy data would allow for a richer look into what contributes to the development of self-efficacy. The present study identified that in many cases experience with diverse populations contributed to levels of self-efficacy, however the use of quantitative self-report measures did not allow for any further explanation as to why experience, what specific experiences, and what aspects of those experiences contributed to self-efficacy for teaching in inclusive classrooms. Asking participants to explain why certain aspects of their lives or teacher education programs will further illustrate how these experiences contribute to the development of self-efficacy.

Conclusion

In conclusion, Canadian faculties of education continue to produce confident, inclusion-oriented teachers. Pre-service teachers felt very confident in their abilities and had strong inclusive beliefs before at the beginning and the end of their times in faculties of education. Toward the end of their teacher education, the level of experience with diverse populations, both personal and professional, became significant predictors for the three factors of self-efficacy for teaching in inclusive classrooms. This highlights the importance of practical experiences and opportunities to interact with diverse population with regards to confidence. Teacher education

programs should continue to try and expose pre-service teachers to as many diverse populations as they can, so they can gain the valuable experience necessary to develop a strong sense of self-efficacy for teaching within inclusive classrooms.

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Table 1

Regression Predicting Pre-Service Teachers' Self-Efficacy for Inclusive Instruction at Program Completion

	Time 1					Time 2				
Predictor	*β*	*SE β*	*Final β*	Sig.	sr^2	*β*	*SE β*	*Final β*	Sig.	sr^2
Gender	-.040	.099	-.028	.688	.001	-.060	.086	-.044	.488	.002
Panel	-.014	.077	-.014	.852	.000	-.039	.066	-.038	.553	.001
Professional Diverse Experience	.042	.055	.065	.443	.003	.127*	.052	.158	.016	.022
Personal Diverse Experience	-.001	.050	-.002	.983	.000	.116*	.043	.174	.008	.026
Diverse Teaching Experience	-.016	.051	-.025	.749	.000	.150	.077	.123	.053	.014
Entity Increment	.148	.056	.193	.009	.032	.180	.050	.247	<.001	.048
Teacher Controlled	.117	.064	.147	.069	.015	.021	.060	.25	.726	.000
Attain Standards	-.093	.050	-.146	.064	.016	.039	.044	.062	.377	.003
Student Centred	.192	.066	.202	.004	.038	.186*	.059	.204	.002	.036

Note: Gender: 0=Male, 1= Female; Panel: 0=Elementary, 1=Secondary.

Table 2

Regression Predicting Pre-Service Teachers' Self-Efficacy for Collaboration at time of Program Completion

	Time 1					Time 2				
Predictor	*β*	*SE β*	*Final β*	Sig.	sr^2	*β*	*SE β*	*Final β*	Sig.	sr^2
Gender	.120	.116	.073	.303	.005	.024	.102	.015	.816	.000
Panel	-218	.090	.-176	.017	.023	-.206	.078	-.172	.009	.026
Professional Diverse Experience	.008	.065	.011	.897	.000	.153	.061	.164	.014	.023
Personal Diverse Experience	.077	.059	.105	.198	.008	.150	.051	.195	.004	.032
Diverse Teaching Experience	.014	.059	.018	.816	.000	.158	.091	.111	.085	.011
Entity Increment	.108	.066	.121	.102	.013	.087	.059	.103	.138	.008
Teacher Controlled	.121	.075	.130	.108	.012	.-065	.072	-.067	.383	.003
Attain Standards	-.018	.059	.-024	.758	.000	.061	.052	.083	.244	.005
Student Centred	.093	.078	.084	.234	.007	.157	.070	-.149	.026	.019

Note: Gender: 0=Male, 1= Female; Panel: 0=Elementary, 1=Secondary.

Table 3

Regression Predicting Pre-Service Teachers' Self-Efficacy for Managing Behaviour at time of Program Completion

	Time 1					Time 2				
Predictor	*β*	*SE β*	*Final β*	Sig.	sr^2	*β*	*SE β*	*Final β*	Sig.	sr^2
Gender	-.220	.114	-.131	.054	.016	-.177	.104	-.110	.090	.011
Panel	-.109	.088	.086	.220	.006	-.175	.079	-.145	.028	.019
Professional Diverse Experience	.172	.063	.220	.007	.031	.196	.063	.209	.002	.038
Personal Diverse Experience	.035	.058	.047	.543	.001	.142	.052	.182	.007	.028
Diverse Teaching Experience	.044	.058	.057	.446	.003	.071	.093	.050	.443	.002
Entity Increment	.098	.064	.108	.130	.001	.168	.060	.197	.005	.031
Teacher Controlled	.142	.073	.150	.055	.016	.044	.073	.045	.548	.001
Attain Standards	-.112	.057	.-148	.052	.016	.040	.053	.055	.444	.002
Student Centred	.160	.076	.142	.307	.019	.119	.071	.112.	.184	.011

Note: Gender: 0=Male, 1= Female; Panel: 0=Elementary, 1=Secondary.

Table 4

Regression Predicting Pre-Service Teachers' Self-Efficacy for Inclusive Instruction at time of Program Completion from Changes in Beliefs

Predictor	*β*	*SE β*	*Final β*	*Sig.*	sr^2
Entity-Increment	.098	.053	.123	.065	.014
Teacher Controlled	-.070	.051	-.093	.174	.008
Attain Standards	.074	.045	.110	.099	.011
Student Centred	.092	.058	.102	.114	.010

Table 5

Regression Predicting Pre-Service Teachers' Self-Efficacy for Collaboration at time of Program Completion from Changes in Beliefs

Predictor	*β*	*SE β*	*Final β*	*Sig.*	sr^2
Entity-Increment	.075	.060	.082	.213	.006
Teacher Controlled	-.141	.058	-.165	.015	.024
Attain Standards	.031	.051	.040	.548	.014
Student Centred	.125	.066	.122	.059	.001

Table 6

Regression Predicting Pre-Service Teachers' Self-Efficacy for Managing Behaviour at time of Program Completion from Changes in Beliefs

Predictor	*β*	*SE β*	*Final β*	Sig.	sr^2
Entity-Increment	.045	.062	.048	.473	.002
Teacher Controlled	-.140	.060	-.159	.021	.023
Attain Standards	.063	.063	.080	.234	.006
Student Centred	.016	.069	.016	.811	.000

Table 7

Pearson correlation matrix for independent variables at time 1

Measure	1	2	3	4	5	6	7	8	9
1.Panel	-	-223**	-.145*	-.047	-.196**	.066	-.008	-.049	.189**
2. Gender	-	-	.089	-.006	.080	-.099	.067	.073	-.068
3.Professional Diverse Experience	-	-	-	.496**	.437**	-.051	.005	.087	-0.71
4. Personal Diverse Experience	-	-	-	-	.311**	-.045	.030	.053	-.179**
5. Diverse Teaching Experience Level	-	-	-	-	-	-.221**	.077	.151*	-.201**
6. Teacher Controlled	-	-	-	-	-	-	-.328**	-.253**	.375**
7. Entity Increment	-	-	-	-	-	-	-	.149*	.235**
8. Student Centred	-	-	-	-	-	-	-	-	.077
9. Attain Standards	-	-	-	-	-	-	-	-	-

*Correlation is significant at the .05 level (2-tailed)

**Correlation is significant at the .001 level (2-tailed)

Table 8

Pearson correlation matrix for independent variables at time 2

Measure	1	2	3	4	5	6	7	8	9
1.Panel	-	-.223**	-.112	-.054	-.143*	.108	-.081	.020	.207**
2. Gender	-	-	0.33	.139*	-.041	-.072	.064	.075	-.124*
3.Professional Diverse Experience	-	-	-	.322**	.163**	.051	.055	.138*	-.023
4. Personal Diverse Experience	-	-	-	-	.198**	-.081	.044	.110	-.149*
5. Diverse Teaching Experience	-	-	-	-	-	-.052	.076	.034	-.056
6. Teacher Controlled	-	-	-	-	-	-	-.409**	-.304**	.405**
7. Entity Increment	-	-	-	-	-	-	-	.336**	-.236**
8. Student Centred	-	-	-	-	-	-	-	-	-.127*
9. Attain Standards	-	-	-	-	-	-	-	-	-

*Correlation is significant at the .05 level (2-tailed)

**Correlation is significant at the .001 level (2-tailed)

Table 9

Pearson correlation matrix for changes in beliefs

Measure	1	2	3	4
1.Change in EI Beliefs	-	-.225**	.013	-.127*
2. Change in Teacher Controlled Beliefs	-	-	-.129*	.259**
3.Change in Student Centred Beliefs	-	-	-	.041
4. Change in Attain Standards Beliefs	-	-	-	-

*Correlation is significant at the .05 level (2-tailed)

**Correlation is significant at the .001 level (2-tailed)

Appendix A

Demographic Questionnaire

Please ✓ on the line as appropriate.

A. I am preparing to teach in the following grades: (check all that apply)

K-3_____; 4-6_____; 7-8_____; 9-10_____; 11-12_____;

B. I am: Male_____; Female_____; Trans*_____; Other (Please specify) _____

C. How do you describe yourself? (*You may choose one answer, or more than one)*

Aboriginal: _____

Black: _____

East Asian: _____

Latin American: _____

South Asian: _____

Southeast Asian: _____

West Asian: _____

White: _____

Other (please specify): _____

D: Birthdate (Day/month/year) _____

E. My highest level of education completed prior to entering this program is:

Secondary School or its equivalent _____ CEGEP (Quebec) _____

Bachelor's degree or its equivalent _____ Master's Degree _____

Other, please specify _____

F. I have encountered people who are diverse learners in the following ways (check all that apply)

Self _____

Family Member _____

Friend _____

Co-Worker/Co-Volunteer _____

In a Professional Role (e.g. teacher, caregiver, advocate) _____

Not at all _____

G. How much *professional* experience have you had working with individuals who are diverse learners? Please circle the following scale, where 0= none at all, 1=little, 2=moderate, and 3= extensive

None at all	Little	Moderate	Extensive
0	1	2	3

H. How much *personal* experience have you had working with individuals who are diverse learners? Please circle the following scale, where 0= none at all, 1=little, 2=moderate, and 3= extensive

None at all	Little	Moderate	Extensive
0	1	2	3

I. To date, I have spent _____ weeks on practicum

J. My experience in teaching students with diverse learning needs to date is

Nil ____ 1-30 Days ____ At least 30 days ____

Appendix B

Teacher Efficacy for Inclusive Practice (TEIP) Scale

This survey is designed to help understand the nature of factors influencing the success of routine classroom activities in creating an inclusive classroom environment.

Please circle the number that best represents your opinion about each of the statements.

Please attempt to answer each question

1	2	3	4	5	6
Strongly Disagree	**Disagree**	**Disagree Somewhat**	**Agree Somewhat**	**Agree**	**Strongly agree**

		SD	D	DS	AS	A	SA
1	I can make my expectations clear about student behaviour.	1	2	3	4	5	6
2	I am a.ble to calm a student who is disruptive or noisy.	1	2	3	4	5	6
3	I can make parents feel comfortable coming to school.	1	2	3	4	5	6
4	I can assist families in helping their children do well in school.	1	2	3	4	5	6
5	I can accurately gauge student comprehension of what I have taught.	1	2	3	4	5	6
6	I can provide appropriate challenges for very capable students.	1	2	3	4	5	6
7	I am confident in my ability to prevent disruptive behaviour in the classroom before it occurs.	1	2	3	4	5	6
8	I can control disruptive behaviour in the classroom.	1	2	3	4	5	6
9	I am confident in my ability to get parents involved in school activities of their children with disabilities.	1	2	3	4	5	6
10	I am confident in designing learning tasks so that the individual needs of students with disabilities are accommodated.	1	2	3	4	5	6
11	I am able to get children to follow classroom rules.	1	2	3	4	5	6
12	I can collaborate with other professionals (e.g itinerant teachers or speech pathologists) in designing educational plans for students with disabilities.	1	2	3	4	5	6

13	I am able to work jointly with other professionals and staff (e.g. aides, other teachers) to teach students with disabilities in the classroom.	1 2 3 4 5 6
14	I am confident in my ability to get students to work together *in pairs or in small groups*.	1 2 3 4 5 6
15	I can use a variety of assessment strategies (for example, portfolio assessment, modified tests, performance-based assessment, etc.).	1 2 3 4 5 6
16	I am confident in informing others who know little about laws and policies relating to the inclusion of students with disabilities.	1 2 3 4 5 6
17	I am confident when dealing with students who are physically aggressive.	1 2 3 4 5 6
18	I am able to provide an alternate explanation or example when students are confused.	1 2 3 4 5 6

Appendix C

Beliefs about Learning and Teaching Questionnaire-Revised

Please read the following statements and indicate how strongly you agree or disagree with each one. All items are to be rated on the 6-point scale ranging from Strongly Disagree (1) to Strongly Agree (6)

	Strongly Disagree					**Strongly Agree**
1. Students should rely on the teacher to evaluate their work	1	2	3	4	5	6
2. Students cannot be counted upon to evaluate their own work	1	2	3	4	5	6
3. It is important for students to complete assignments exactly as the teacher planned	1	2	3	4	5	6
4. In every class I find students to whom I cannot teach core concepts	1	2	3	4	5	6
5. It is important for teachers, not students, to direct the flow of a lesson	1	2	3	4	5	6
6. It is important for teachers to have control over lessons	1	2	3	4	5	6
7. The ability to learn is something people have a certain amount of and there isn't much they can do to change it	1	2	3	4	5	6
8. The ability to learn is something that remains fixed throughout life	1	2	3	4	5	6
9. There isn't much I can do about how much ability I have in mathematics, science and language arts	1	2	3	4	5	6
10. There will always be some students who simply don't get it no matter what I do	1	2	3	4	5	6

11. To assess students' understanding of a core concept, it is important to observe and listen to them as they work	1	2	3	4	5	6
12. Good teachers give students choices in their learning tasks	1	2	3	4	5	6
13. In core subjects, students should construct their own examples	1	2	3	4	5	6
14. Good instruction relates learning material to things students are interested in outside of school	1	2	3	4	5	6
15. It doesn't matter whether students get the right or wrong answer as long as they understand the concepts inherent in the problem	1	2	3	4	5	6
16. Concerns about getting the right answer are likely to interfere with concept development and learning	1	2	3	4	5	6
17. Giving grades is a good strategy for getting students to work	1	2	3	4	5	6
18. The more students are concerned about grades, the more they learn	1	2	3	4	5	6
19. All of my students would do well if they worked hard	1	2	3	4	5	6
20. Students who produce correct answers have a good understanding of the core concepts	1	2	3	4	5	6

Appendix D

Normality Tests

Time 1 Use of Inclusive Instruction

3 cases were identified as being above the Mahalanobis Distance threshold, indicating the presence of possible multivariate outliers. The distribution of residuals satisfied the assumption of normality, Kolmogorov-Smirnov p=.200.

Time 2 Use of Inclusive Instruction

5 cases were identified as being above the Mahalanobis Distance threshold. The distribution of residuals satisfied the assumption of normality, Kolmogorov-Smirnov p=.200.

Time 1 Collaboration

3 cases were identified as being above the Mahalanobis Distance threshold, indicating the presence of possible multivariate outliers. The distribution of residuals failed to satisfy the assumption for normality, Kolomogorov-Smirnov p=.029, however further inspection of the histogram for the distribution of residuals indicated that the distribution appeared to be approaching normality.

Time 2 Collaboration

5 cases were identified as being above the Mahalanobis Distance threshold. The distribution of residuals satisfied the assumption of normality, Kolmogorov-Smirnov p=.092.

Time 1 Managing Behaviour

3 cases were identified as being above the Mahalanobis Distance threshold. The distribution of residuals satisfied the assumption of normality, Kolmogorov-Smirnov p=.050

Time 2 Managing Behaviour

5 cases were identified as being above the Mahalanobis Distance threshold. The distribution of residuals satisfied the assumption of normality, Kolmogorov-Smirnov p=.200

Change in Beliefs as Predictors

For all analyses, 2 cases were identified as being above the Mahalanobis Distance threshold, and The distribution of residuals satisfied the assumption of normality, Kolmogorov-Smirnov p=.200.

Evan Charles

PROFILE

My primary research interests are inclusive education, teacher self-efficacy, and the benefits of the use of assistive technology in the classroom.

EDUCATION

Master of Arts, School and Applied Child Psychology **September 2017 – April 2019**

- 8.92/10 cumulative GPA

Bachelor of Arts, Specialization in Psychology **September 2013 – April 2017**

University of Ottawa, Ottawa, Ontario

- 8.33/10 cumulative GPA, magna cum laude

EDUCATIONAL EXPERIENCE

Tutor **October 2018 – Present**

Boys and Girls Club, London, Ontario

- Tutoring local elementary school students in literacy, math, and problem solving

In-School Mentor **October 2018 – Present**

Big Brothers Big Sisters, London, Ontario

- Acting as a friend and role model to an elementary school student

Classroom Volunteer **February 2017 – April 2017**

Ottawa Volunteers in Education, Ottawa, Ontario

- Assisted in the facilitation of second grade reading, writing, and math lessons

PROFESSIONAL HISTORY

Developmental Support Worker **October 2018 – Present**

Community Living London, London, Ontario

- Provide in-home care and support to children and adults with developmental disabilities
- Participate in the development of support plans
- Administer and accurately document medication

Graduate Research Assistant **September 2017 – Present**

University of Western Ontario, London, Ontario

- Data entry and data collection
- Facilitation and transcription of interviews
- Complete literature searches

Events Coordinator **July 2018 – August 2018**

Community Living London, London, Ontario

- Created and modified events and games to accommodate the needs of children and adults with developmental disabilities
- Assisted with staff scheduling and the tracking of staff hours

Camp Counsellor

Ryerson United Church Camp, Vittoria, Ontario **June 2013 – August 2013**

- Responsible for the safety, entertainment, and wellbeing of campers aged 6 to 15

- Facilitated camp games and activities

HONOURS AND AWARDS

Ontario Graduate Scholarship **September 2019**
Dean's list, University of Ottawa, Ottawa Ontario **September 2015 – April 2017**

SKILLS

Computer: Microsoft Word, Microsoft Excel, Microsoft PowerPoint, SPSS, Qualtrics
Language: Fluent English, conversational French