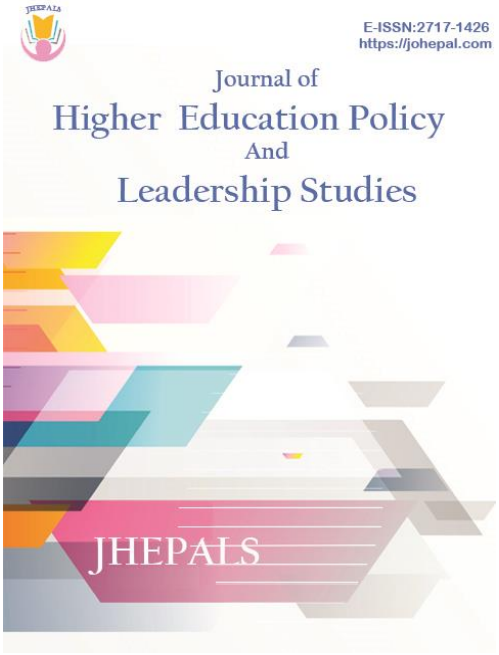
Journal of
Higher Education Policy
And
Leadership Studies

JHEPALS (E-ISSN: 2717-1426)

https://johepal.com



A Case Study of Teacher Candidates' Experiences: Writing the Pilot Math Proficiency Test in Ontario, Canada

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Article Received **2021/11/29** | Article Accepted **2021/12/25** | Published Online **2021/12/30**

Cite article as:

Eizadirad, A., Holm, J., & Sider, S. (2021). A case study of teacher candidates' experiences: Writing the pilot Math proficiency test in Ontario, Canada. *Journal of Higher Education Policy and Leadership Studies*, *2*(4), 121-139. DOI: https://dx.doi.org/10.52547/johepal.2.4.121

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[DOI: 10.52547/johepal.2.4.121]

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Journal of Higher Education Policy And Leadership Studies (JHEPALS)

E-ISSN: 2717-1426
Volume: 2 Issue: 4
pp. 121-139
DOI:
10.52547/johepal.2.4.121

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Abstract

The focus of this article is on the introduction, justification, and enactment of the Mathematics Proficiency Test (MPT) by the provincial government in Ontario, Canada as a mandatory certification requirement for newly certified teachers. This article contextualizes the socio-political factors leading to the enactment of a MPT for newly certified teachers, developed and administered by the Education Quality and Accountability Office (EQAO), which was ostensibly to mitigate the trend of declining math scores in elementary schools. It then shifts to examine the experiences of the first cohort of teacher candidates from a Canadian university who participated in writing the pilot MPT in February and March of 2020. Data was collected via survey responses administered through Qualtrics software. Survey invitations were sent to all teacher candidates who graduated in 2020 or 2021 with 50 of the 130 eligible teacher candidates responding. A thematic analysis of survey responses was conducted to discuss emerging findings about teacher candidates' experiences before, the day of, and after writing the MPT as a case study. On December 17, 2021 the Ontario Superior Court of Justice ruled the MPT unconstitutional due to having an adverse impact on entry to the teaching profession for racialized teacher candidates.

Keywords: Math Proficiency Test; Teacher Candidates; Standardized Testing; Newly Certified Teachers; Diversity in Teaching

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Snapshot of Changes in Education in Ontario, Canada: 2019 to 2021

2020 and 2021 been an abnormal year in many aspects for the education sector intensified by circumstances created by the COVID-19 pandemic. Although the focus of the article is on the experiences of teacher candidates writing the pilot MPT, contextualization of other major events in education occurring before and after the MPT announcement can assist in understanding more holistically the issues discussed. This will provide a greater understanding and of the complexities and nuances involved in how the Ontario Ministry of Education justified and enacted a MPT as a response to declining math score trends in provincial elementary schools (Artuso, 2019).

The 2019-2020 school year began with major cuts by the provincial Conservative government to all levels of education including elementary, secondary, and post-secondary (Syed, 2019). This led to escalating job actions through work to rule at elementary and secondary school levels by all four teacher unions in the province of Ontario including the public elementary and high school teachers, Catholic school teachers, and French school teachers. Teacher contracts with the government expired at the end of August 2019 and work to rule campaigns by teachers began at the start of the 2019-2020 school year. Work to rule actions escalated in intensity into 2020 as negotiations with the government stalled and the budget cuts led to elimination of many teacher positions with some educators even being laid-off (Collaco, 2019). At the post-secondary level, university departments were instructed to reduce their budgets by 10 percent to mitigate less central funding from the government (Redden, 2019). With the drastic increase in number of COVID-19 cases provincially and nationally, schools at all levels were shut down and shifted to remote learning to mitigate the spread of the virus (Royal Society of Canada, 2021).

After extensive media coverage and escalating work to rule job action by teachers, in many cases supported by concerned students and parents in the midst of a pandemic, the teacher unions reached a three-year agreement with the provincial government in April 2020 (Smith, 2020). With schools not scheduled to re-open for the remainder of the school year, the provincial government announced that standardized tests in Grade 3, 6, and 9, and 10, developed and administered by EQAO, were cancelled for the 2019-2020 school year (EQAO, 2020b). The successful completion of the Grade 10 Ontario Secondary School Literacy Test, which is a high-stakes requirement to graduate and obtain a high school diploma in Ontario, was waived for students eligible to graduate. Near the end of the school year in June 2020, the government further announced that Grade 3 and 6 EQAO standardized tests would not be administered for the 2020-2021 school year due to the circumstances created by the pandemic (EQAO, 2020c). The Ontario Ministry of Education also introduced a new elementary math curriculum for Grades 1 to 8 which was implemented in schools as of September 2020 (Ontario Ministry of Education, 2020). Furthermore, in July, the government announced the end of academic streaming in Grade 9 (DeClerq, 2020), and the elimination of student expulsions in the early years from Kindergarten to Grade 3 which disproportionately impacts Black, Indigenous, and people of colour (Colour of Poverty, 2019; James, 2020). When schools re-opened in September 2020 while still facing challenges caused by COVID-19 and a resurgence of a second wave, many parents opted to keep their children at home for virtual schooling. Many school boards scrambled to hire new teachers and finalize teacher timetables to accommodate the high number of parents who had opted for virtual schools to start the school year (Wong, 2020).

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We are now in the midst of a 4th wave with some restrictions being lifted and more in-person activities resuming at all levels of education. Yet, with the rise of new COVID variants, schools continue to face emerging challenges as they work towards creating equitable teaching and learning environments for all stakeholders including students, parents, and educators.

Declining Math Scores and the Justification for Accountability via a Math Proficiency Test

The provincial Conservative government led by Ontario Premier Doug Ford and Minister of Education Stephen Lecce announced in 2018 a mandatory Math Proficiency Test to be written by all teacher candidates applying to become certified Ontario teachers on or after March 31 2020 (OCT, 2020). This was part of a $55 million dollar investment in improving math achievement of students in the province in response to declining math score trends in elementary schools as shown in Figure 1 below (Artuso, 2019; EQAO, 2019).

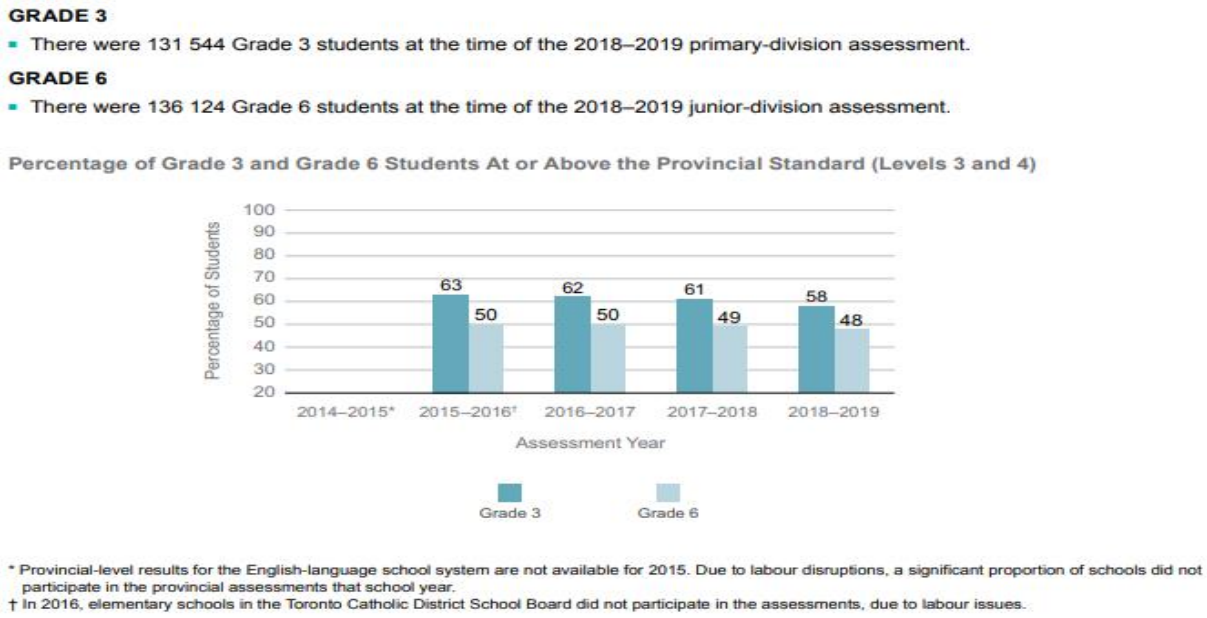


Figure 1. Education Quality and Accountability Office (2019). *Highlights of the Provincial Results: Mathematics. Page 2.*

Bar graphs from Figure 1, as outlined in the EQAO report *Highlights of the Provincial Results: Mathematics* (2019) shows that the number of students who are achieving at the expected provincial level in Grade 3 and 6 have declined since 2015-2016. Data from the 2014-2015 school year is not available due to work to rule actions by teachers which resulted in refusal of administrating EQAO standardized tests. In Grade 3, the overall achievement level of students in the province has declined from 63% in 2015-2016 to 58% for 2018-2019, and in Grade 6 from 50% to 48% respectively during the same time period. These trends received extensive media coverage and became a cause of concern for the ministry resulting in investment of 55 million dollars in math which included the development and enactment of a Math Proficiency Test (Artuso, 2019), which applies to all new teachers regardless of the grade they will teach.

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Teacher Candidates' Experiences: Writing Pilot MPT

Typically, a few months after writing EQAO administered tests, each student receives an Individual Student Report which "describes his or her achievement on the test" (EQAO, 2012, p. 8) ranging from Level 1 being below grade expectations to Level 4 being above grade expectations in relation to the Ontario provincial curriculum standards. According to EQAO (2011), "the provincial standard is a Level 3 which corresponds to a B- or B+" (EQAO, 2011, p. 2). If students meet or exceed the Level 3 achievement level it is inferred they have mastered and demonstrated most or all the required curriculum skills and expectations (EQAO, 2011). As of 2021, EQAO is working to administer some of its tests online as a means of modernization (EQAO, 2020d).

Normalization of Standardized Testing as an Accountability Tool

Leading up to the 1990s, the province of Ontario had no history of mandated large-scale assessments in elementary or secondary schools whether for students or teachers (Volante, 2007). Standardized tests for teacher certification first surfaced in early 2000s when "from 2002 to 2004, Ontario experimented with a range of forms of teacher testing with mixed reactions from stakeholders, where some said it favoured public accountability, but constrained teacher professionalism" (People for Education, 2020, para. 3; see Glassford, 2007 for a detailed history). The teacher testing initiative was implemented in Ontario but shortly after cancelled when a new government was elected the following election.

In the early 1990s, educational issues, such as Ontario's poor record on international assessments such as the PISA and TIMMS assessments, received extensive media coverage and the public became increasingly disgruntled with the education system. The government came under a lot of pressure to justify how they were preparing students for the rise of a knowledge-based economy (Gidney, 1999; Pinto, 2016). The government responded by investing in creating Ministry approved common curriculum outcomes (Grey, 2017) and EQAO standardized tests at various grades to ensure accountability to the public (EQAO, 2012). This resulted in the publication of *Common Curriculum: Policies and Outcomes Grades 1-9* by the Ontario Ministry of Education in 1995 as standardized curriculum. Shortly after, in 1996, EQAO was created as an arm's length agency of the Ministry of Education (EQAO, 2013). Each year EQAO assesses students in all Ontario publicly funded schools in Grades 3, 6, 9, and 10 focusing on numeracy and literacy using criterion-referenced census-style standardized tests as a means of providing "an independent gauge of children's learning and achievement" (EQAO, 2012, p. 1). For all assessments, questions are linked to the Ontario curriculum expectations and include a range of multiple choice, true and false, and open-ended response questions. Each school and school board receives a detailed report about overall achievement of their student population.

Many studies have examined EQAO standardized testing and its impact on different identities and social groups (Campbell et al., 2018; Eizadirad, 2019, 2020; Fesseha et al., 2020; Hargreaves, 2020; Pinto, 2016; Wickstrom et al., 2020). Educational reforms in various countries over the past 30 years, including the well-known No Child Left Behind initiative in the United States, aim to ostensibly increase accountability through standardized curriculum and testing. These neoliberal educational reform efforts are tied to an increasingly globalized economic system (Hursh, 2007). Standardized assessments within these movements can be largely criticized for perpetuating educational gaps instead of addressing systemic barriers and conditions that have led to gaps in education amongst different social

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groups (Abawi & Eizadirad, 2020; Au, 2016; Colour of Poverty, 2019; Royal Society of Canada, 2021; Toronto Foundation, 2021). This is not say that standardized testing in some cases has not led to school or student improvements, but on a larger systemic level, it has failed to mitigate achievements gap trends across social groups (Au, 2009; Curtis et al., 2010; Eizadirad, 2020; Eizadirad & Sider, 2020; Kohn, 2000; Nagy, 2000; Royal Society of Canada, 2021; Toronto Foundation, 2021). With the introduction of the MPT, what has been missing in the scholarly literature, particularly in the context of Ontario, Canada is the examination standardized assessments for teacher certification purposes and the extent of its effectiveness (Nagy, 2000).

About the Math Proficiency Test Created by EQAO

The MPT requires that all new teachers who are applying for a certificate with the Ontario College of Teachers to pass the MPT. Internationally educated teachers are given two years from their application to the OCT to pass the MPT (OCT, 2020). Due to social distancing measures and restrictions created by COVID-19, the Ministry of Education has extended the deadline to fulfill the MPT condition from August to December 31, 2021. (OCT, 2020). According to the testing blueprint, "the MPT has 75 items. Each unique test (test form) contains 71 items that count towards the teacher applicant's score. These are 50 mathematics content items (70% of the test) and 21 pedagogy items (30% of the test)" (EQAO, 2020a, p. 6). The mathematics section is "based on mathematics content knowledge from the Ontario Curriculum Mathematics documents (grades 3 to 9)" (EQAO, 2020a, p. 5). It is important to note that all new teachers regardless of the grade they will teach need to pass this test, with a pass being 70% on both sub-sections, to obtain their teaching certificate. The pilot MPT was administered in-person at various testing centres with two hours allocated for its completion via a computer-based delivery method.

Methods & Positionality of Authors

All three authors for this article are full-time professors teaching within a Faculty of Education program at a Canadian university. As a collective, we noticed that the announcement of the MPT made many teacher candidates uncomfortable, anxious, worried, and in some cases angry, particularly Year 2 teacher candidates near graduation for which this condition for certification did not exist when they started their 2-year Bachelor of Education program. This led us to discuss the matter at a preliminary meeting to explore various strategies and pedagogies to support our students and better prepare them socially, emotionally, and content-wise for writing the MPT. Whereas one of the authors specializes in mathematics education, the other two specialize in equity and inclusion in education such as the impact of standardized testing on racialized students and experiences of persons with disabilities. The intersectionality of our research backgrounds and our desire to support teacher candidates led us to capture teacher candidates' experiences writing the pilot MPT as a case study to explore its impact, given that they would be the inaugural group to participate in writing the MPT.

Ethics approval was granted by the university's Research Ethics Board for this research project. We used a questionnaire to capture the experiences of teacher candidates with the MPT. The questionnaire was developed with a focus on capturing the experience of teacher candidates before, the day of, and after writing the MPT in February or March 2020. Twenty-

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one question items were identified and included in the questionnaire. The questionnaire was hosted and administered through Qualtrics, a secure data collection website. Invitations were sent to all teacher candidates in the Faculty of Education program who would graduate in 2020 or 2021. Surveys were completed between May 5 and June 3, 2020. Fifty of the 130 eligible participants participated which represents a 38% response rate. Within our sample, 17 teacher candidates were from the 2020 graduating cohort (27% of the cohort) and 31 teacher candidates from the 2021 cohort (46% of the cohort). All institutional research ethics protocols were followed in the development, distribution, analysis, and reporting of the questionnaire results.

Responses were analyzed using thematic analysis (Clarke & Braun, 2017; Creswell, 2007; Green et al. 2007). Clarke and Braun (2017) operationalize thematic analysis as "a method for identifying, analyzing, and interpreting patterns of meaning ('themes') within qualitative data" (p. 297). They distinguish the difference between codes and themes by explaining,

> Codes are the smallest units of analysis that capture interesting features of the data (potentially) relevant to the research question. Codes are the building blocks for themes, (larger) patterns of meaning, underpinned by a central organizing concept - a shared core idea. Themes provide a framework for organizing and reporting the researcher's analytic observations. The aim of TA [thematic analysis] is not simply to summarize the data content, but to identify, and interpret, key, but not necessarily all, features of the data, guided by the research question. (p. 297)

Thematic analysis functions as the glue or gel that paints the big picture understanding of the issue under study relative to the research question. By examining participants' voices and experiences pre, during, and after writing the MPT we can better understand and further explore the short and long-term effects of standardized tests for teacher certification purposes. We utilized the analysis tools of Qualtrics software to pool survey responses for each question. Then through multiple meetings, as the three authors, we went through the data by question to identify a series of keywords that would become our codes for analysis and discussion. From our list of keywords and codes, we dialogically given our respective backgrounds, developed six themes to represent the sample data set. In the following sections we discuss the themes which are: inequitable access to testing locations and challenges with registration, logistics related to attending the MPT test location, preparation for the MPT; negative emotions in anticipation of the MPT; effectiveness of the MPT; and considerations for future teacher candidates preparing for the MPT.

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Findings

Theme #1: Inequitable Access to Testing Locations and Challenges with Registration

EQAO, which administered the MPT, determined test locations across the province for applicants to take the MPT. There were many cities with Faculties of Educations that did not have a possible testing centre. Most of our participants (70%) indicated that they were not able to register for the MPT in their preferred location and more than 80% of participants had to travel more than 50 km to write the MPT. An illustrative quote by one teacher candidate expressed the challenges and costs associated with ensuring they were available on testing day and getting to the testing location on time:

> I rented a vehicle for the day to drive to Toronto. I had to make arrangements for my children, since my test time was rescheduled closer to the test date and I would no longer be home to care for them after school.

Furthermore, many teacher candidates found the process of registering for the MPT frustrating, anxiety-inducing, and stressful. This was attributed to numerous factors: enrollment via a central website beginning at 1 pm mid-day when many of them were in classes, accessibility to location sites in terms of distance particularly lack of sites in close proximity to the region in which the university was located, the enrollment website crashing or being slow due to high number of users accessing the site simultaneously, having to create an account before being able to sign up for a testing centre, and Wi-Fi issues limiting their speed to complete the registration and gain access to their preferred location. In some cases, the registration took up to an hour when it should have taken less than 10 minutes. Many expressed that the website was not user-friendly and this added to their anxiety and frustrations. For example, many testing centres reached maximum capacity quickly and hence teacher candidates had to select another available location. Further, they were also not allowed to enroll at another location, unless they gave up the location they had secured. Many chose to go with "what they can get" as a way of ensuring they had an opportunity to write the test. One teacher candidate felt that the registration process was "Unnecessarily stressful and burdensome on students. Frustrating that locations and time slots were not announced earlier leading to feeling like we had to sign up for the first open slot we saw." Another candidate stated that,

> The day of enrolment was more stressful than the test day. We were pitted against each other for spots. I felt bad for our professor who lost an hour of teaching time so we could register. Not everyone was successful in getting a spot. I secured the only spot left, 2 hours away, on a day when I had two Bachelor of Education classes.

These quotes illustrate the frustrations that teacher candidates experienced with the registration process. The process exacerbated concerns that teacher candidates already had about the MPT and contributed to their sense of anxiety as the MPT day approached.

Theme #2: Logistics of Attending the Test Locations

Although for some teacher candidates writing the MPT went relatively smooth, a majority of the respondents found the process inequitable, frustrating, stressful, and disruptive. Factors such as weather on the testing day, distance travelled to get to the testing centre, having to make arrangements for child-care, amount of traffic on the way to the testing site,

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and transportation costs (e.g., gas, bus fare, parking fees, hotel fees, etc.) made the experience negative for many teacher candidates. Some candidates booked a hotel close to the testing centre, as their test began at 8:30 am and they had to travel over 100 kms to get to the testing location. One teacher candidate described the situation this way:

> Had to pay for gas to get there. Had to pay for parking. This was very frustrating. Test location is over an hour away. This was very inconvenient. I had to take a day off school in order to complete the test. I was stressed about hitting traffic in Toronto. And there was a ton of traffic to and from the test location.

Technical issues affiliated with test administration further made the experience stressful and frustrating. As some reported, at the start of writing the test, there were technical computer issues which took from 15 to 60 minutes to resolve. In some cases, teacher candidates had to switch rooms multiple times to complete writing the test via different computers. Some of the teacher candidates described having to stay at a hotel the night before the MPT and despite planning in advance for potential challenges, they still experienced frustrations. They stated that,

> [We] booked a hotel the night before that was near the campus. We studied pretty late into the night with very mixed emotions. The day of the exam, we arrived early and sat impatiently waiting to write. Once we logged in at 8:30am the network crashed. This required us to wait until IT was able to contact the MPT centre. I did not begin my test until roughly 9am.

These types of challenging situations further added to the stress teacher candidates experienced in writing the MPT.

Theme #3: Preparation for Passing the MPT

Participants indicated a breadth of techniques and strategies to prepare for the MPT. The most common responses included a practice test provided by the Faculty of Education as part of their math classes, and external materials that participants found themselves and shared with each other. Many participants noted they found the EQAO practice questions and sample tests provided by the Faculty of Education helpful in preparing for the MPT. Some noted how difficult it was to give effort to the MPT during the school year because of the competing demands on their schedule and attending a placement which led tor a need to "cram" near the test date.

There were similar comments about the difficulty with preparing for the pedagogy component of the MPT which focused on knowing specific content from the curriculum front matter (Ontario Ministry of Education, 2005), *Growing Success* (Ontario Ministry of Education, 2010), and *Learning for All* (Ontario Ministry of Education, 2013) Ministry documents. These documents are important foundational documents for teachers in Ontario with a focus on curriculum, assessment, and instructional practices. One teacher candidate expressed, "I spent the two weeks prior to the proficiency test essentially memorizing the Mathematics front matter, *Growing Success,* and *Learning for All*. This was necessary because the questions were so oddly specific in this section."

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Theme #4: Negative Emotions as the MPT Approached

In describing their feelings and emotions about the MPT, many teacher candidates used negatively ascribed words. Words used included anxiety, nervousness, doubt, worry, stress, distraction, fear, uncertain, panic, fear of failure, avoidance, apathy, frustration, annoyed, and overwhelmed. The most frequently stated words were nervous, anxious, and stressed. As one participant noted, "I was extremely anxious and had no clue what to expect. All information about the test was very vague and I was going to a completely new campus that I was very unfamiliar with which added to the anxiety." Given the frustration and anxiety participants claimed, there was a possibility that the test heightened feelings of insecurity and impacted teacher candidates' abilities on the MPT. Some participants felt that they would be fine with the mathematics content portion of the MPT, but the pedagogy questions raised concerns since there was a common feeling to simply memorize the three relevant Ministry documents. One teacher candidate expressed, "I constantly felt anxious and stressed. Everyday I would go home after a long day of classes or school-based days and would study all night." Another teacher candidate echoed these concerns, stating, "I was nervous that the technology would crash as I heard many reports that this had been happening…. I felt like my entire academic career was on the line in that moment." Some teacher candidates expressed concerns with the format of the MPT:

> I am probably in the minority when I say I was not stressed for the MPT at all. I enjoy math and it is a strength for me, so I wasn't concerned about passing the math content questions. My anxiety came from my colleagues who wrote the test before me and told me how needlessly specific the pedagogy questions were. There were around 20 questions based on information spanning three rather large documents, where they asked us specific information from random boxes in the documents. This was not testing our ability to be a new and innovative teacher, but rather, our ability to memorize information. This form of testing is exactly what we are NOT supposed to do with our students.

The teacher candidates who participated in this study generally expressed that they had experienced many negative emotions about the MPT. Some of these negative emotions were attributed to the content of the test while others were focused on the process of registering, traveling to, and completing the test. Still others raised concerns about the high stakes nature of the test and expressed anxiety about their future if they did not successfully complete the test.

Theme #5: Applicability to Teaching and Being an Effective Teacher

Participants generally commented about two concerns they had about the applicability of the MPT to their future teaching career. First, those who were Primary/Junior (Kindergarten to Grade 6) teacher candidates indicated that they found some questions not applicable to the level at which they will be certified to teach since the material on the test covered up to Grade 9. For example, one participant stated, "Since I am planning to teach Grade 3 or lower, all the questions on the test were not relevant to my teaching profession." Second, many commented on the relevance of the pedagogical questions, not specifically because of the pedagogy, but because of the need to memorize aspects related to pedagogy. The majority of participants commented that they found the math content questions relevant but not the pedagogy questions. As one participant stated, "…we will always have access to these

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documents so why have them memorized?" Another participant provided a critical perspective about the relevance of the questions to teaching:

> I did not find the math questions relevant to the teaching profession whatsoever. Knowing something and being able to teach something are completely different entities. Just because I know how to read a graph or solve an algebraic equation doesn't mean that I can teach others how to do it. I don't feel any more confident about being a math teacher because of this test.

There was an overwhelming consensus that teacher candidates felt the MPT would not make them a more effective teacher. One teacher candidate summarized this idea in this statement: "The only benefit of the MPT was that it forced me to refresh on math concepts. A test is not an accurate indicator of how well someone can teach." Another teacher candidate echoed this sentiment by noting,

> The test taught me the exact emotions and reactions that I do not want my future students to endure. In my teaching career, I will avoid standardized testing as much as I possibly can and will do my absolute best to ensure the positive health and well-being of my students.

Numerous participants similarly noted they felt that the MPT only taught them what not to do in mathematics. Clearly, participants in this study did not perceive that the MPT made them more effective teachers.

Theme #6: Advice for Future Teacher Candidates and Educational Stakeholders

Participants provided a variety of reflection and advice for future teacher candidates who will write the MPT as well as for other educational stakeholders. Most participants stressed the importance of studying throughout the pre-service education program to be fully prepared for the MPT, use online resources that provide practice problems, take advantage of resources offered by the Faculty of Education, and study with peers. As one explained,

> It is very different than anything you've done in the B.Ed. It is more like going back into undergraduate studies and taking an exam for a course you didn't take. Study all the materials provided in depth. Pay special attention to terminology. In fact, I found studying and memorizing the glossaries very helpful. Study math problems with a friend and solve them together.

Many participants focused on encouraging a positive mindset, staying calm, and taking time to breathe. One participant stated,

> You are a teacher candidate because of your desire to teach and love for education. This test result does not define you and your ability to teach inside and outside of the classroom. In life, sometimes we need more than one opportunity in order to grow and learn. Do your best. Prepare in a way that meets your needs, whether it be small study groups, reading about math concepts before bed or completing math sheet after math sheet. You got this!

Some participants also gave noteworthy feedback about how the Faculty of Education could support future teacher candidates on the MPT by allocating additional time and courses to mathematics content knowledge and helping with studying for the pedagogy section.

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Other suggestions to better support teacher candidates included: more math courses available whether optional or mandatory within Faculties of Education across the province, making math Additional Qualification (AQs) courses accessible by making them free or available at a reduced cost, and creation of more professional development opportunities for new and existing teachers. Focusing on only new certified teachers was not perceived as a systemic approach to mitigating the reduced math scores in the province over the last few years. Some suggested that the MPT would be more effective if it were differentiated based on grades and subjects that teacher candidates would be qualified to teach. Overall, it was suggested there needs to be greater investment in professional and pedagogical training for existing and new teachers to improve math scores. As one teacher candidate suggested,

> Focus on teacher professional development and support in schools. Reduce class sizes, provide greater small group math support, and make more essential resources for emergent math students available. All classrooms should have math manipulatives, access to relevant mathematics technology and software, and funding for substitute teachers so that classroom teachers may experience on-going professional development. Provide materials, training, and funding to support teachers in the classroom: these are paramount.

Overall, many teacher candidates felt based on their experience of writing the pilot MPT that it was not an effective tool to improve math scores across the province.

Discussions: Shifting from Equality to Equity

Overall, the identified themes based on the experiences of first cohort of teacher candidates writing the pilot MPT at various locations in February and March of 2020 indicates they felt the test was not a constructive way to help them feel more confident and comfortable in teaching mathematics. Holm and Kajander (2020) examined the use of a high-stakes examination in mathematics knowledge for teaching as a requirement for graduation and noted that these should be used with caution in order to support learners. Similarly, McGraw and Fish (2018) cautioned against using high-stakes tests as a gatekeeper to teacher education programs and instead found focusing on developing skills and understandings during teacher programs as more effective. The research into the difficulties with high-stakes testing for teacher certification purposes leads to questions about diversity, or lack of it, in the teacher workforce (Abawi & Eizadirad, 2020), particularly how the MPT can become a gatekeeping mechanism that may deny or deter future teachers from entry into the profession particularly for those from historically marginalized and equity-deserving social groups (Nagy, 2000; Battiste, 2013).

Putwain and Remedios (2014) identify fear appeals as the "persuasive messages designed to facilitate a course of action so as to avoid a negative outcome" (p. 504). Putwain and Remedios (2014) discuss how students who heard more fear appeals and perceived these messages as "threatening," correlated with a lower performance on examinations. This research raises concerns about how the messages of a high-stakes test would be perceived and if the negative perceptions could lead to lower scores. Considering the negative messages shared by participants, it is likely that they felt the enactment of the MPT was "threatening" to them. Although participants in this study were adults, it is important to note that the words they used to describe their experiences writing the MPT aligns with

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findings by Eizadirad (2019) when he interviewed Grade 3 children about their experiences writing EQAO standardized tests in elementary schools.

The need for large scale standardized testing for students in Ontario in the 1990s and now similarly the MPT for new teachers has been justified via constant reference to accountability logic and its associated mechanisms to mitigate the achievement gap that exists between different social groups (Basu, 2004; Eizadirad, 2019). Poor results on standardized tests are often blamed on a combination of teachers and their ineffective teaching methods and/or students and their lack of effort or incompetency rooted in deficit thinking (Gidney, 1999; Pinto, 2016). This market logic of seeking improvement through legislation of standardized tests simplifies and homogenizes the complexities involved in creating supportive and inclusive teaching and learning conditions where students, parents, teachers, and community members need to work collaboratively to identify local needs and construct a plan of action with intentionality to mitigate those needs with consideration for systemic barriers that impact each community and school uniquely (e.g. the intersection of racism and poverty, number of racialized students, English Language Learners, student in special education with an Individual Education Plan, etc.). Legislation of standardized tests, whether for students or teachers, is not a holistic equity-centred place-based approach to improving teaching and learning as it lacks consideration for systemic barriers that influence teaching and learning. This is a one-size-fits-all equality approach to solving an equity problem. As Weiner (2014) emphasizes, "standardization is an ideological principle that attempts to legitimate the decontextualization of learning and teaching in the service of raising the academic bar" (p. 5).

Although results from EQAO standardized tests have provided some useful data for schools since their implementation beginning in 1996, the gaps have not drastically minimized between different social groups in Ontario, and in many cases those gaps have further intensified and widened particularly for Black, Indigenous, racialized students, and those from lower socio-economic backgrounds (Colour of Poverty, 2019; Eizadirad 2019, 2020; Fesseha et al., 2020; James, 2020; Hargreaves, 2020; Harris et al., 2011; Wickstrom et al, 2020). These inequities have further intensified by circumstances created by COVID-19 (Royal Society of Canada, 2021; Toronto Foundation, 2021). As Garrison (2009) points out in *A Measure of Failure: The Political Origins of Standardized Testing*, "Standardized test-based assessment is the judgement of worth relative to a structural slot of social position—what is deemed of value and who is deemed of value—a process abstracted as achievement or ability" (pp. 11-12). Therefore, from an equity lens, we must acknowledge differences in our positionalities and consequentially access to power and privilege at a systemic level within our schools and institutions. By extension, as it relates to teacher education and the diversity in the workforce, we must ask who will likely be in a social position to gain access to teacher education programs and pass high-stakes tests such as the MPT to gain entry to a teaching profession which already lacks diversity in many communities? This is not a good or bad binary, but an issue that requires on-going discussions and multiple perspectives and strategies. The MPT presented as an accountability tool and "the solution" is not constructive as it functions as a gatekeeper to the teaching profession, by privileging those already in positions of power and privilege where their cultural capital is reinforced in schools at the expense of marginalization to historically marginalized identities. We agree with Weiner (2014) arguing for a shift towards a critical theory of education at all levels. As

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Weiner (2014) puts it, "It is a critical theory of education born out of the need to better understand how domination—wrapped in educational policy, pedagogy, curriculum development, and assessment—oppresses, marginalizes, and/or silences students, especially those from working-class backgrounds" (p. 19). Hence, a critical theory of education works with communities and various stakeholders from a grassroots bottom-up approach guided by identifying local needs to improve teaching and learning at all levels, rather than relying exclusively on market-driven logic and legislation such as standardized assessments for teacher certification purposes to demonstrate improvements in education. Simply put, improvements in outcome-based standardized tests do not equate to improvements in teaching and learning as it does not examine the processes and conditions that lead to production of disparities in educational outcomes. As Weiner (2014) explains, "In a world where economic and cultural power are distributed differentially, to demand standards of outcome while ignoring standards of opportunity is to stack the deck of opportunity against those who possess limited and limiting power" (p. 55). In other words, we must address the opportunity gap that often leads to disparities in educational achievements across different social groups.

Recommendations

Considering the concerns raised and expressed by the teacher candidates about writing the MPT as a case study, we make the following recommendations:

- We recommend a serious re-consideration for utilizing standardized test for teacher certification purposes. The literature for most parts expresses ineffectiveness in these types of assessments in reducing achievement gaps across different social groups (Au, 2016; Eizadirad, 2019; Garrison, 2009). We argue that the MPT can serve as a gatekeeper to the profession rooted in neoliberal market-driven approach to education which diminishes the knowledge capital of teachers and instils more government authority over educational policies using a one-size-fits-all approach to solving equity issues.

If the MPT cannot be rolled back and cancelled, we make the following recommendations to improve its enactment and its associated processes:

- Differentiate the test to the grade or certification level of teacher candidates to make the content more socio-culturally relevant and age appropriate. Also, vet the questions on the MPT to promote questions that assess higher level thinking and that they align with the *Ontario Mathematics Proficiency Test Assessment Blueprint* (EQAO, 2020a). Ensure that the questions on the MPT mirror evidence-based best practices in large-scale assessment including the application of knowledge and critical thinking rather than questions that simply involve memorization of "pedagogy."
- Create a committee consisting of mathematics, assessment, and equity experts involving representation from the Ministry of Education and Faculties of Education to evaluate the short and long term efficacy of the MPT, with a report to be published yearly to continue the dialogue and exploring effective ways to improve math scores at all levels.

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- Provide equity of access to the MPT by ensuring testing locations are in close proximity to all Faculties of Education. Minimize test day anxiety and confusion for teacher candidates by ensuring all MPT sites are prepared to administer exams without glitches. This includes clear communications of where to park, which rooms the tests are administered, and ensuring computer test-taking programs are up to date. Consideration should be given to administer future tests remotely.

Conclusion

In conclusion, it is important we take a moment to pause and reflect and listen to the narratives and lived experiences of teacher candidates writing the pilot MPT and think about the emerging learning lessons from this experience. We acknowledge that this is a small sample presented as a case study, and that further research is needed to capture the short and long term impact affiliated with MPT, both in terms of its influence in the diversity in the teacher workforce and achievement levels in students at all levels. Most recently, On December 17, 2021 the Ontario Superior Court of Justice ruled the MPT unconstitutional due to having an adverse impact on entry to the teaching profession for racialized teacher candidates (Ontario Teachers' Federation, 2021; see details of the court ruling at Ontario Teacher Candidates' Council v. The Queen, 2021 ONSC 7386). Due to the court ruling, teacher candidates who have completed all teacher certification requirements except having successfully passed the MPT will be certified as new teachers. At this stage, in the midst of recovering from a pandemic, we must ask ourselves as part of larger discussions and identifying next steps whether achievement scores in math can systemically and holistically improve via legislated standardized tests for students and newly certified teachers? More importantly and by extension, we must also ask how can we make assessments equitable to meet the needs of various local communities, each impacted uniquely by a range of systemic barriers such as racism and poverty (Montenegro & Jankowski, 2020; Stiggins, 2014)? These questions should continue to guide the dialogue and conversations from multiple perspectives as we seek to support students and future teachers so they can achieve to their full potential.

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