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Analyzing Student Supports in Destreamed Math: Helping Students Succeed and Make Informed Choices About PSE

Natalie Pilla, Ryan Tishcoff & Jackie Pichette

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The Higher Education Quality Council of Ontario

88 Queens Quay West, Suite 2500
Toronto, ON
Canada, M5J 0B8

Phone: (416) 212-3893
Fax: (416) 212-3899
Web: www.heqco.ca

E-mail: info@heqco.ca

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Executive Summary

In July 2020, the Ontario Ministry of Education (EDU) made the policy decision to destream Grade 9 compulsory courses, starting with Grade 9 math. This policy, and related government investments in academic supports and equity strategies, have the potential to create more equitable postsecondary and labour market opportunities for students graduating high school. However, the province has a long, unsuccessful history of implementing destreaming policies, dating back to the early 1960s (Pichette et al., 2020). Ongoing evaluation is essential to ensuring the current destreaming effort is successful.

HEQCO partnered with two English-speaking school boards in western Ontario to learn about supports and equity-focused strategies implemented during the first year of destreamed Grade 9 math. We developed and administered surveys to over 1,500 Grade 9 math students during the 2021-22 academic year. We posed questions about students' experiences with equity and inclusion as well as academic supports, including interactive computer applications offered by third parties and available in their school boards, in-person and online math tutors, and the Learning Strategies course. We also asked about students' plans for their future education.

We found important signs of success: most survey respondents (80%) either earned or expected to earn a passing grade or higher in the destreamed course. Of those who used the academic supports we asked about (35%), more than half found benefit for their learning. Government-supported, equity-focused strategies also had some success — a large proportion of students reported generally positive experiences of equity and well-being in their destreamed Grade 9 math classrooms. A large proportion also planned to enrol in academic Grade 10 math, which provides more pathways into Grade 11 and beyond to postsecondary.

Some equity issues also deserve attention and remediation. Students with special education needs (SEN) were more likely to find destreamed Grade 9 math difficult and were less likely to earn or expect to earn 70% or higher in the course than students without SEN. Students with SEN did not report the same positive experiences of equity and well-being. Equity strategies seemed to break down at the point of knowledge mobilization: many students were unaware of the equity intentions behind the destreamed Grade 9 math course, were uninformed about the implications of their course selections for PSE pathways and felt unsupported in making course selections.

In response, HEQCO recommends that school boards and EDU:

- Continue to invest in and promote a range of academic supports.
- Evaluate board-wide supports and strategies to facilitate improvements and ensure their long-term success.
- Continue to invest in equity strategies, including professional development for educators that reflects and responds to students' needs.
- Evaluate and improve knowledge mobilization strategies to ensure that students and parents are aware of the destreaming policy and its implications for course selection.

- Develop a provincial educational data infrastructure to facilitate the evaluation of the long-term outcomes of the destreaming policy.

Introduction

Ontario was the only province in Canada to separate students into academic and non-academic courses — a process called streaming — as early as Grade 9 until as recently as 2021 (EDU, 2017). Ontario policy-makers formally introduced streaming in the 1960s as a way of aligning schooling with specific career paths (Pichette et al., 2020). However, over the last decade in particular, educators, journalists and researchers have explained how the practice contributes to systemic inequities that constrain students' postsecondary options (Follwell & Andrey, 2021; Parekh et al., 2021; Gordon, 2017; Brown & Tam, 2017; Rushowy, 2013; OECD, 2012). To achieve more equitable outcomes, EDU announced a policy in summer 2020 to destream Grade 9 courses beginning with math in 2021 and following with English, science, geography and French over the next academic years (Government of Ontario, 2020).[1] This policy is intended to ensure all students in Grade 9 core courses have access to consistently rigorous curriculum and instruction, and in turn, more opportunities upon graduation.

Shortly after EDU announced its destreaming policy, HEQCO released a report — *Destreaming in Ontario: History, Evidence and Educator Reflections* (2020) — detailing Ontario's history of attempts to destream and providing evidence to inform implementation efforts. We recommended that researchers measure the effectiveness of various student supports to ensure the policy is implemented in a way that achieves its goal of promoting equitable access to postsecondary (Pichette et al., 2020). To follow up on this work, HEQCO partnered with two Ontario school boards during the 2021-22 school year to learn from the first cohort of Grade 9 students to take destreamed Grade 9 math.

This report provides a brief overview of Ontario's policy decision and its implementation then summarizes findings from our surveys about students' experiences with the course and the relevant supports and strategies. These findings better explain how well learning supports and board-wide equity strategies are working to ensure that students excel in the destreamed classroom and beyond. We offer recommendations for the provincial government and school boards to ensure all Grade 9 destreamed courses have positive, long-term outcomes.

Literature Review

The Ontario government's decision to destream Grade 9 math in September 2021 was a response to pointed criticism: that the practice of streaming limits postsecondary options for students in non-academic streams and systematically disadvantages equity-seeking students, including Black students, Indigenous students, students from low-income families, students learning English as a second language and students with special education needs (SEN) (Follwell & Andrey, 2021; Gordon, 2017; Rushowy, 2013). Destreaming aligns with the OECD's recommendation to provide a common curriculum until the senior years of high school to reduce

[1] EDU announced that Grade 9 science, geography and French will be offered in one stream beginning in the 2022-23 academic year (Naylor, 2021).

the risk of non-completion (OECD, 2012; Bauer & Riphahn, 2006). Providing a common curriculum gives students the opportunity to select courses aligned with their skill levels and career interests later in their secondary education when they have clearer career plans and more honed understandings of their strengths. Evidence shows that students often name different career aspirations in their senior years of high school than they do in earlier years (Helwig, 2004) and their career aspirations become more specific at this later stage (Witko et al., 2008).

Prior to 2021, Ontario Grade 9 math students had the option of taking Academic, Applied or Locally developed courses. Destreaming the Grade 9 math course in the 2021-22 academic year delayed students' important choice between Academic and non-Academic math streams until Grade 10. These streams correspond to more explicit postsecondary pathways in Grades 11 and 12: University Preparation, University/College Preparation, College Preparation, Workplace Preparation and Transfer courses (Smaller, 2014).

Historically, students tended to take all courses in the same stream throughout high school. Although they are permitted to change streams, students rarely do so. Prior to destreaming, students had to complete transfer courses to change from Applied to Academic, but these courses were often not offered during school hours (People for Education, 2019). This means students' choice of stream, made previously in Grade 9 and now made in Grade 10, restricts options available to them in later grades; by extension, this restricts their postsecondary options after graduation (McGrath, 2020). A recent longitudinal analysis of TDSB data illustrates the cumulative effect of these restrictions: 70% of students who did not complete any Grade 12 University-level courses did not apply to postsecondary, and less than a quarter went to college (Gallagher-Mackay et al., 2023).

The 2021-22 academic year also marked a dramatic shift in EDU's approach to math education across the province, insofar as EDU updated the Grade 9 course curriculum for the first time since 2005, making changes to both instructional content and delivery (Government of Ontario, 2021a; 2021b). The new curriculum is purported to place a renewed emphasis on job-relevant and practical life skills (e.g., problem solving, reasoning and proving, mathematical thinking, financial literacy, coding and data literacy) (EDU, 2021). Teachers are expected to deliver the new curriculum in more inclusive classrooms where all students benefit from consistently high expectations and are positioned to succeed in math and access various postsecondary pathways (EDU, 2021).

Many of these changes reflect the Ontario government's efforts to improve and modernize the math curriculum.[2] They were implemented as part of pandemic-related investments, so may be time-limited. In 2019, the Ontario government launched investments to help students develop necessary math skills for personal and career success (Government of Ontario, 2019a; 2019b). In the following years, EDU grappled with how best to respond to pandemic-related learning disruptions and met with school boards and community members to plan for successful destreaming policy implementation (Government of Ontario, 2021a; 2021b). The results are

[2] Starting in 2019, Ontario rolled out a revised math curriculum for all students in all grades focused on the fundamentals of mathematics and how to apply them (Government of Ontario, 2019b) and launched resources and initiatives to strengthen math skills for all students (Government of Ontario, 2019a).

reflected in the provincial four-year math strategy, the "Learning Action Recovery Plan," (Government of Ontario, 2022a) and the *Plan to Catch Up* (EDU, 2022a). These documents expanded access to school-based tutoring while leaving flexibility for school boards to decide on specific approaches; some school boards have offered tutoring in school, online and/or through partnerships with community organizations and private companies (Teotonio, 2022). These plans expanded access to online tutoring through Mathify, a free virtual service (Government of Ontario, 2022b; Government of Ontario, 2019a). They also provided temporary additional staffing during the first year of destreamed Grade 9 math, aimed to provide direct academic supports to students and facilitate more equitable and inclusive learning environments (Government of Ontario, 2022b).[3] These, and other widely available supports used by HEQCO's partner school boards, are described in Figure 1.

Figure 1

Academic Supports Available at Partner School Boards[4]

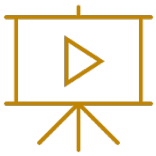
Tutoring

Tutoring programs provide an average ratio of five students to one educator. Sessions take place during school hours, before or after school, on weekends and in the summer (Government of Ontario, 2022a; Government of Ontario, 2022b). These programs have been available since April 1, 2022.[5]

Mathify

Mathify is a free, one-on-one online tutoring service available across Ontario for students in Grades 4 to 12, designed to make math accessible and approachable for all Ontario students (TVO Learn Mathify, 2022). Students are connected with an Ontario Certified Teacher who works with them to build their math skills and confidence (TVO Learn Mathify, 2022). Mathify was launched in 2007 at two Ontario school boards and extended province-wide in 2021.[6]

Knowledgehook



Knowledgehook is an instructional guidance system targeted to students in Grades 3 to 10. Students are engaged in immersive, game-based activities designed to improve their understanding of math concepts (Knowledgehook, 2022). The platform assesses

[3] It is important to note that these initial investments in tutoring and supplementary learning were specific to destreamed math, so they may not be adequate as the destreaming policy is expanded across all Grade 9 core courses.
[4] The Ministry of Education has no direct relationship with the proprietors of Knowledgehook or Desmos.
[5] In-school tutoring programs were mandated as of April 1, 2022 for the 2021-22 and 2022-23 academic years (Government of Ontario, 2022b).
[6] Mathify was extended across the province in 2021 in response to pandemic-related disruptions to students' learning (Gallagher-Mackay et al., 2022). It is aligned with the Ontario math curriculum and has a mandate to make math accessible and approachable for all Ontario students (TVO Learn Mathify, 2022).

student performance against the province's learning objectives and provides progress reports to teachers and parents (Kirkwood, 2020).[7]

Desmos

Desmos is an online platform that provides free digital classroom activities that help students explore math concepts and collaborate with peers through problem-based learning (Desmos, 2022). Desmos has guiding principles that align with the practice of destreaming and the Grade 9 math curriculum; the organization is committed to recognizing and reducing their biases, and helping all students love learning math (Bourassa, 2020).[8]

Learning Strategies Course

The Learning Strategies course is an optional, credit-bearing course that focuses on literacy skills, numeracy skills, personal management skills and interpersonal and teamwork skills (EDU, 2006).[9] One of our school board partners adapted the program delivery slightly to help students close gaps in math as part of the general Learning Strategies curriculum.

In addition, EDU and school boards developed and implemented strategies to enable equitable and inclusive learning environments. These efforts included anti-racism and anti-oppression training (Government of Ontario, 2021a; 2021b) and encouraged the use of culturally relevant and responsive pedagogy in math classrooms (EDU, 2021). EDU and school boards also developed and implemented strategies to ensure that students and parents were aware of the destreaming policy, and its implications, through parent guides, school newsletters and resources on the curriculum website (EDU, 2021). HEQCO's partner school boards worked to involve a range of staff members and incorporate student voices, perceptions and lived experiences in their efforts to increase student well-being and achievement in a destreamed environment.

An evaluation of how well the supports worked is especially important given the timing of the destreaming policy rollout. Ontario implemented the new destreamed Grade 9 math course during an academic year impacted by public health measures and staffing shortages related to the COVID-19 pandemic. Students in Ontario faced the longest school closures in the country, with 28 weeks in which they could not attend school in person (Glauser, 2022). Throughout the school year, courses fluctuated between online, in-person and hybrid delivery formats in response to public health measures (Herhalt, 2021). This interrupted students' learning, increased mental health strains and made it more difficult for students to access school supports (Glauser, 2022; Herhalt, 2021). EDU released the Grade 9 math curriculum in June

[7] Knowledgehook made their system widely available in 2020 in the context of emergency remote learning (Kirkwood, 2020). School boards can share this support with students at their own discretion.
[8] Similar to Knowledgehook, school boards can share this resource at their own discretion. A number of Ontario school board websites include Desmos as a resource for students in Grade 9 math (Notre Dame Catholic Secondary School, n.d.; York Region District School Board, n.d.).
[9] At one of HEQCO's partner boards, the Learning Strategies course was offered in the summer and throughout the school year.

2021 and expected school boards to launch the curriculum in September 2021 (Ontario Teachers' Federation, 2021), leaving only three months for preparation, professional development and teacher training (People for Education, 2022). Additionally, school boards are expected to evaluate their tutoring programs, but the Ministry did not provide specific guidance or additional resources to support research departments responsible for this work (Gallagher-Mackay, 2022). We approached our evaluation of the supports and strategies for destreamed Grade 9 math with these complexities in mind.

Research Questions and Methodology

Our project was guided by the following research questions:

- What were students' impressions of destreamed Grade 9 math supports (i.e., in-school tutoring, Mathify, Knowledgehook, Desmos and a Learning Strategies course) and strategies?
- How many students made use of the supports available to them?
- What destreaming supports and strategies did students think were most effective?
- Do students understand the effects of destreaming on their potential postsecondary pathways?

Steering committees at each partner school board helped develop the surveys, including identifying which supports to evaluate, and helped administer the surveys to students in their final week of the destreamed Grade 9 math course during the 2021-22 academic year. Students either completed the course in a quadmester[10] or semester format, and may have completed their course fully online, in a hybrid format or in person. The surveys varied slightly between the two boards to reflect the distinct supports available and strategies in place.[11] Surveys at both boards asked about students' perceptions of the difficulty and demands of the Grade 9 math course, specific supports and strategies that they encountered and their plans for Grade 10 math and after high school. We include survey questions from both boards in the Appendix.

The data collected reflects students' perceptions, rather than direct measures, of the effectiveness of the supports. The sample was voluntary, non-representative and non-random. We limited our analysis to descriptive statistics and do not comment on a given support's usefulness directly. To preserve the anonymity of participating boards, we report combined characteristics and results, where possible. When findings are limited to one board, we note this in the text.

[10] Quadmesters are periods of two months when students focus on two courses at a time. Semesters are periods of five months when students focus on four courses at a time (Rushowy, 2021).
[11] At one board, for example, the steering committee was particularly interested in understanding how well classroom technology tools, like iPads, were working to support students. At the other, the steering committee was most interested in learning about the uptake of government-funded resources, like Mathify, and other widely available supports, including Desmos and Knowledgehook.

Student Sample Characteristics

Across the two school boards, a total of 1,665 students completed a survey, with the larger of the two boards being more heavily represented. The demographic patterns in the sample align with the most recently available school board census data and the deidentified administrative data shared by one of the boards (see Table A1 in the Appendix outlining the overall student sample characteristics). Roughly half of the sample identified as male, the other half as female. Most respondents were born in Canada and did not have SEN. Just over half of the sample identified as white, and half identified as belonging to another racial group. The administrative data one board shared allowed for a supplemental analysis of students' participation in a Learning Strategies course.

Findings and Discussion

Most students persevered in destreamed Grade 9 math despite the effects of the pandemic. Over 80% of students at both boards either earned or expected to earn a passing grade or higher in the course. That said, a quarter of the respondents found the course to be more difficult than their other courses. This was especially true for students with SEN,[12] who were more likely to find destreamed Grade 9 math difficult and demanding than students without SEN. Students with SEN were also less likely to earn or expect to earn 70% or higher in the destreamed Grade 9 math class compared to students without SEN.[13]

Academic Supports

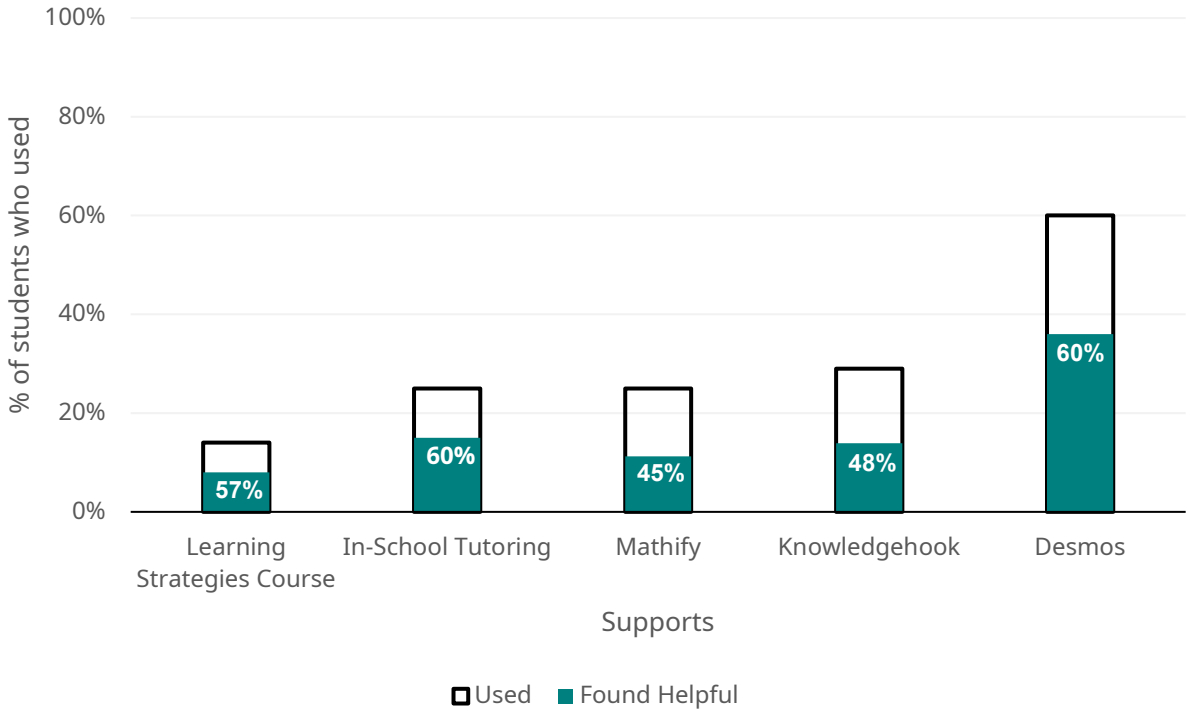
The five academic supports outlined in Figure 1 appeared to be working well for over half of the students who accessed them. However, access rates for most supports were generally low; fewer than 30% of students[14] accessed the majority of the supports (three out of five), with Desmos being the notable exception, accessed by 60% of students. In-school tutoring, Desmos and the Learning Strategies course were helpful for the students who accessed them.[15] Survey results pertaining to each of these supports appear in Figure 2. Half of the students who accessed the supports indicated that they helped. However, between 40% and 60% of those who used them did not indicate they were helpful, suggesting that there is an opportunity for

[12] Students with SEN were those who indicated in their survey responses that they have an identified exceptionality and/or have SEN addressed through an individual education plan (IEP).
[13] Ideally, we would have examined whether and how pandemic-related differences in course delivery mode may have affected students' perceptions of this destreamed course. Only the smaller of the two school boards asked students whether they took the course in an online, hybrid or in-person format. This meant that we did not have enough survey responses that would allow us to examine differences in students' grades or perceptions of difficulty for the destreamed Grade 9 math course by delivery format while also controlling for changes in semester formats throughout the academic year. However, we do know that interest in virtual schooling is waning (Jones, 2022) and it is now highly unlikely that destreamed math will be offered in remote formats in future semesters (EDU, 2022b). This makes further inquiries into how course delivery formats affected perceptions of the destreamed Grade 9 math course far less urgent or important for our understanding of supports and equity strategies.
[14] Only one board specifically asked about these supports. The other asked about math applications broadly, inclusive of applications like Desmos and Knowledgehook.
[15] Given the range of topics included in the survey, there was limited space to ask further questions around the reasons why students did not access supports, which may have included school board decisions to target supports towards specific populations of students.

district school boards and the province to learn more about who is not being served and how supports could be improved.

Figure 2

Usage and Helpfulness of Supports at One Ontario School Board



Note: This figure shows the percentage of all students who used each support at one school board, and out of those who used each support, the percentage that found it helpful.

Learning Strategies Courses

EDU and school boards provide Learning Strategies courses as part of the Guidance and Career Education curriculum (EDU, 2006). These optional, credit-bearing courses can help prepare students succeed in a rigorous learning environment and therefore play an important role in successful destreaming (Pichette et al., 2020).[16] According to administrative data for this project, only a small proportion (12%) of the Grade 9 cohort at one of our partner school boards took the Learning Strategies course before taking destreamed Grade 9 math.[17] Students who took the course were more likely to have not met the curriculum expectations for their Grade 8 subjects, earned a 69% or lower in Grade 8 math, be a student with SEN, be a student taking other compulsory courses in the Locally developed or Applied streams or live in neighbourhoods with lower incomes.

[16] The Learning Strategies courses support students' development and application of literacy and numeracy skills, personal management skills and interpersonal skills. They also aim to build students' confidence to pursue future educational and work opportunities (EDU, 2006).
[17] The Learning Strategies course was shared with students and parents before the end of Grade 8. School board staff may also have advised students to participate in the course, particularly students who had low measures of achievement before starting high school. The course was primarily provided in-person at both partner school boards.

Of the survey respondents who took a Learning Strategies course, 57% felt that it made them feel more confident in destreamed Grade 9 math, and 55% felt that it made them more confident in their other Grade 9 courses. When students had the opportunity to provide an open-ended response to share what they found useful about the course, they mentioned that the review of all math topics helped them understand what Grade 9 math would be like, and that it was helpful to review specific topics they struggled with — including algebra, fractions, exponents and geometry. These responses align with research in the United States that reported students who participated in an elective Learning Strategies course described it as having a positive impact on their academics (Lowder et al., 2022). That study also reported that students with similar prior achievement levels in Grade 8 who participated in the course had statistically better achievement and rates of high school graduation than those who did not participate. As the remaining compulsory Grade 9 courses are destreamed in Ontario, the existing Learning Strategies course could be tailored to support students with low previous achievement in English, science, geography and French by developing subject-specific literacy or numeracy skills, for example.

In-School and Online Tutoring (Mathify)

A quarter of respondents at one school board accessed in-school tutoring, 22% accessed private tutoring and 25% accessed Mathify. Approximately 60% of students who accessed in-school tutoring or private tutoring said that it increased their confidence in destreamed Grade 9 math, suggesting that tutoring, whether publicly subsidized or accessed privately, is similarly helpful. This raises a question of whether prioritizing access to in-school tutoring for equity seeking students (including those from low-income families) could help ensure all students, regardless of socioeconomic status, are able to access this support as needed.

A slightly lower proportion of students who accessed Mathify reported that it was helpful compared to those who used in-school tutoring: 45% of them reported that it made them feel more confident in destreamed Grade 9 math. It is difficult to explain the potential differences in perceived effectiveness between in-school tutoring and Mathify without knowing further details, such as how frequently students accessed either support, or whether “in-school” was consistently offered in-person or online. However, we do know from prior research that tutoring is particularly effective when students access it at least three times a week and are consistently paired with the same tutor, who can customize their approach (Nickow et al., 2020; Ander et al., 2016; Cook et al., 2014; Gallagher-Mackay et al., 2022; People for Education, 2022). Mathify is drop-in only — students are not consistently paired with the same tutor for ongoing support (Gallagher-Mackay et al., 2022), and we do not know the frequency that students access tutoring, nor whether they are consistently paired with the same tutor for in-school tutoring.

According to publicly available information through the EDU’s *Plan to Catch Up*, on average, 49,000 students across elementary and secondary schools participated in in-school tutoring programs focused on literacy and math each week from May to June 2022 (EDU, 2022a). Mathify reports that over 70,000 students across Grades 4 to 12 access their platform each year (TVO Learn Mathify, 2022). This represents fewer than 1% of all elementary and secondary students enrolled in Ontario public schools in the 2020-21 academic year (Government of

Ontario, 2022c).[18] In contrast with these provincial figures,[19] the survey data suggest our school board partner had a very strong uptake of in-school tutoring and Mathify among the Grade 9 students. Individual school boards have discretion as to how to best utilize provincial funding for tutoring and how to best inform students about this support. Further evaluation could help explain why students at certain boards are inclined to access these supports in such high numbers, and whether that access is affecting their success in Grade 9 math.

Knowledgehook and Desmos

Students at both boards identified computer applications as helpful supports that increased their confidence in destreamed Grade 9 math. One board asked more specific questions about two of these supports individually. Over a quarter of students who were asked about Knowledgehook indicated that they used it (29%). Forty-eight percent of those who used it said that it made them feel more confident in Grade 9 math.

The Knowledgehook platform collects and analyzes data from student assessments to track where students are in their math journey and identify learning gaps (Knowledgehook, 2022; Kirkwood, 2020). Teachers and parents may use this information to assess students' performance against the province's learning objectives and provide personalized guidance (Stockwood Strategy, 2021). Platforms that use data systems to identify students' level of performance can detect students who are at risk early and inform parents and educators (Freeman & Simonsen, 2015).

Of all the supports listed in Figure 1, Desmos was the most-used. Students found Desmos as useful as in-school tutoring. Sixty percent of those who used this support indicated that it increased their confidence in Grade 9 destreamed math. According to the platform's website, Desmos is a free, holistic and dynamic digital tool designed to support student's learning in Ontario's math curriculum (Desmos, 2022). Dynamic digital tools can positively impact students' perceived self-efficacy as they enable students to interact with digital mathematical objects, practice their learning and get immediate feedback (Hillmayr et al., 2020; Puhl, 2019; Murphy, 2016). Many educators across the province elected to use Desmos[20] even before the pandemic to support math classes (Make Math Moments, 2021). One of Desmos' primary tools is a graphing calculator, which has been found to increase the problem-solving confidence of high school students to a greater extent than other commonly used graphing calculators (Montijo, 2017). Teachers can use the platform to provide digital classroom activities, monitor students' progress and ask students questions to better understand how they are doing — both personally and with their learning (Bourassa, 2020).

Equity Strategies

Both school boards provided professional development focused on anti-racism and anti-discrimination as a key part of destreaming implementation and ongoing board-wide strategies

[18] Publicly available data on enrolment numbers for the 2021-22 school year were not yet available as of this writing.
[19] This is not a direct comparison, as the province-wide figures include a range of grade levels.
[20] The Ministry of Education has no direct relationship with Desmos.

to ensure equitable and supportive learning environments. Our survey results indicate generally positive experiences of equity and well-being among students in Grade 9 destreamed math classrooms.

Before the implementation of the destreaming policy, students of colour were more likely to be streamed into the Applied pathway (Follwell & Andrey, 2021; Robson et al., 2019; Gordon, 2017; Rushowy, 2013), and those placed in "lower ability" streams often felt disempowered and misunderstood and were likely to conform to teachers' low expectations (Johnston et al., 2022). Following implementation of the destreaming policy, at one of our partner boards, nearly 80% of students said that they felt safe, supported and accepted in their math classroom, 70% said that they feel free to be themselves and 70% were planning to take Grade 10 math in the Academic stream. Students of colour[21] were as likely as white students to indicate that they felt safe, supported and accepted, free to be themselves and that they were planning to take Grade 10 math in the academic stream.

Students with SEN were less likely to indicate that they felt safe, supported and accepted (68%) and free to be themselves (58%) in their math classrooms compared to students without SEN (80% and 70%, respectively). Students with SEN were also less likely to choose Grade 10 Academic math (48%) than their counterparts (76%). This suggests that more needs to be done to ensure that the destreaming policy also leads to experiences of equity and well-being for students with SEN, who account for 17% of all elementary and secondary students in the 2021-22 academic year (Government of Ontario, 2023).

Since the onset of the pandemic, EDU has provided supports for students who access special education programs, with a focus on learning supports. In early 2022, EDU expanded access to special education supports, invested in early intervention in math and summer learning programs for students with SEN to help them prepare for a destreamed curriculum, and provided an overall increase in special education grant funding for that academic year (EDU, 2022a). While these are important steps to support students with SEN, ongoing targeted support is necessary as the destreaming policy is implemented across all Grade 9 compulsory courses. Research conducted prior to the pandemic suggests biases like ableism worked to disadvantage students with SEN (Parekh & Brown, 2019); pandemic disruptions magnified inequities by reducing access to educational and medical services, leading some students to disengage and struggle (Underwood et. al., 2021). Continued learning supports for students with SEN, and professional development with a focus on inclusive education will be essential to the success of Ontario's destreaming policy and to ensure that all students experience well-being in their classrooms.

School boards and EDU have worked to inform stakeholders about the destreaming policy and its implications for students' postsecondary options. While some survey respondents indicated that they were informed about destreaming and its implications, a substantial proportion indicated that they were unaware of the equity intentions behind destreamed Grade 9 math,

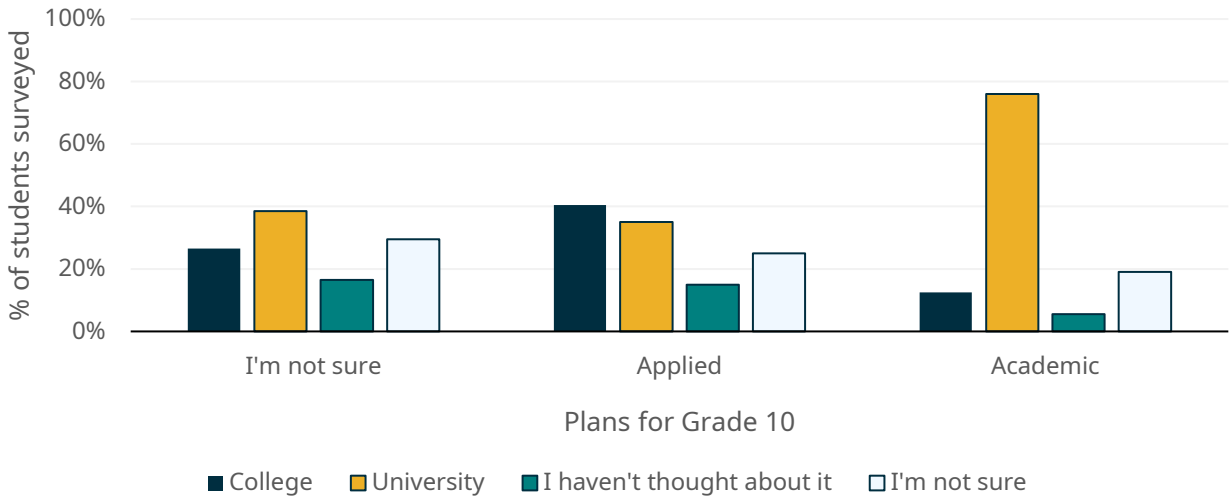
[21] This term refers to students who indicated that the racial group(s) that best describe(s) them was not white, but was one or more of the following: Black, East Asian, Indigenous, Latino/Latina/Latinx, Middle Eastern, South Asian or Southeast Asian. Full descriptions of the response options are provided in the Appendix. Due to small cell counts, these categories were combined. More nuanced racial data may yield differing results.

uninformed about the implications of their course selections for PSE pathways, and felt unsupported when making course selections. Ensuring students are well informed and supported is essential to the success of the destreaming policy and achieving equitable outcomes, especially given that previous research has found that students in low-income and racialized neighbourhoods are less likely to have access to supports and information when making course selections (Polanyi et al., 2017).

At one board, 20% of students did not know that they were in a destreamed course, and fewer than half (42%) understood that math was destreamed to equalize opportunities for students. Perhaps more troubling, survey responses from both boards suggest that students have misunderstandings about the available pathways to PSE based on their course selection in high school (see Figure 3).

Figure 3

Students' Plans for Grade 10 Math and After High School



Note. This figure shows different plans for Grade 10 math streams (divided by percentage and across both boards into those who weren't sure, those who planned to take Applied courses, and those who planned to take Academic courses). The coloured bars indicate student plans for after high school (college, university, "I haven't thought about it" and "I'm not sure").

On average, across both boards, 35% of students indicated they planned to take Applied Grade 10 and planned to pursue a university education after graduation. Of those students who were not sure which stream they would pursue in Grade 10 math, more than a third (39%) indicated that they may later pursue a university credential. These students may face challenges pursuing their desired pathway after graduation; previous research indicates that students in Applied courses are less likely to access university and/or apply to postsecondary compared to their peers in the Academic stream (Au et al., 2022; Gallagher-Mackay et al., 2023). Students who take Grade 10 Applied math will have to take additional courses to achieve the necessary

prerequisites for certain university programs (EDU, 2022c).[22] Grade 12 University-level math courses appear particularly important for students' transition to university: in an analysis of TDSB data, 97% of students who took at least one of these courses applied to postsecondary (Gallagher-Mackay et al., 2023).

Approximately 20% of students at one board said that they did not have help when choosing their Grade 9 courses, and 33% did not have help when choosing their Grade 10 courses. An important aspect of a successful destreamed Grade 9 policy is that students are aware of PSE pathways, informed about how their course selections influence these pathways and are supported when making their selections. Without this knowledge, understanding and support, students will continue to select courses that may not align with their postsecondary and workplace goals.

We did not find demographic differences in students' awareness of being in a destreamed course or their knowledge of the reasons for destreaming. But some students did have less access to supports and information when making course selections. Students of colour, students who speak a language at home that is not English and students who have been in Canada for fewer than 10 years were 1.3 times more likely than their counterparts to have no one support them when choosing their Grade 9 courses. Although students of colour and students who have been in Canada for fewer than 10 years were also five times more likely to get support from a guidance counsellor when choosing their Grade 10 courses, the proportion of all students who had support from a guidance counsellor was small; 11% received help when choosing their Grade 10 courses, and 4% received help when choosing their Grade 9 courses.

Students transitioning from destreamed Grade 9 to streamed Grade 10 courses make course selections that will impact their pathways. We note that this decision is made before students take the mandatory Grade 10 careers course, in which they learn about prerequisites for further learning and for their careers (Government of Ontario, 2022d). Guidance counsellors play a role in informing students about their options, but our findings indicate that very few students receive their support. EDU has emphasized the importance of school guidance counsellors for student success through policies that outline their role in PSE, career and life planning and in connecting parents and students to information and resources (Hamlin & Kidder, 2015). Before the pandemic, People for Education reported a lack of guidance counsellors in Ontario secondary schools. In their survey, they found the average ratio of students to guidance counsellors in Ontario schools was 375:1 (People for Education, 2019), and that not all students have an Individual Pathways Plan (IPP), which provides guidelines to help students navigate their future and make choices about life after high school. While 57% of schools reported that all students had an IPP, some (35%) reported that only "some" students had an IPP, and 9% reported that "none" had an IPP (People for Education, 2019).

Pre-pandemic, guidance counsellors had little bandwidth and resources to support all students with their further education and career planning, and many students did not have an IPP. These issues, combined with the additional challenges faced in many secondary schools during the

[22] More specifically, if their program requires the Grade 12 Calculus and Vectors or Advanced Functions courses, students who take Grade 10 applied math will have to take additional courses to achieve the necessary prerequisites compared to a student who took Grade 10 academic math.

pandemic, may have made guidance counsellors even less available or accessible to students, and to historically disadvantaged students in particular. Those who did not have support from a guidance counsellor turned to their parent(s) or guardian(s) (47%), teachers (7.5%), friends (6%) or another family member (4%), and 26.5% had to make the choices by themselves.

Conclusions and Recommendations

The province has a 60-year history of streaming. Multiple attempts to destream have failed at implementation in the face of negative reactions from education communities, short windows for schools to implement the change and a lack of data and opportunity to evaluate experiences and outcomes (Pichette et al., 2020). Educators, administrators and students involved in the current policy rollout faced additional challenges related to pandemic restrictions.

Despite these challenges, our research indicates Ontario is moving in the right direction with its destreaming policy and targeted investments. In general, the students at our partner boards are using and benefitting from academic supports, including those supported by government and other widely available supports. The supports that students accessed most frequently and found most helpful were Desmos and in-school tutoring. Students had positive experiences of equity and well-being in their destreamed Grade 9 math classrooms and were planning to take Academic Grade 10 math; students with SEN were the notable exception.

Nevertheless, we also found many students were unaware of the equity intentions behind the course, were uninformed about the implications of their course selections and feel unsupported when making course selections. This lack of awareness could result in students restricting their postsecondary options through their Grade 10 course selections (which delays rather than addresses the negative effects of streaming). It may also create a window for misinformation among stakeholders, including parents, which could impact the long-term success of Ontario's destreaming policy.

We recommend the following for school boards and government to assist the ongoing implementation of destreaming.

1. **Continue to invest in academic supports.**

As future cohorts enrol in destreamed Grade 9 courses, it will be essential that school boards and EDU work together to continue providing supports for them. As the remaining core courses are destreamed and investments to support pandemic recovery subside, EDU should assess whether expanded and/or additional supports are needed to ensure the success of a fully destreamed curriculum.

2. **Evaluate board-wide supports and strategies to facilitate improvements.**

EDU and school boards should work together to ensure academic supports, including but not limited to tutoring, are being evaluated effectively. Ongoing evaluation of the availability,

awareness, uptake and effectiveness of supports is essential to ensure that investments are adequately addressing students' needs in a fully destreamed curriculum.

3. **Continue to support professional development for staff that reflects and responds to changing needs and student experiences.**

To ensure that we do not lose ground, continued professional development around anti-racism and anti-discrimination is needed to ensure educators are equipped to examine and interrogate biases. This training should specifically interrogate biases related to students with SEN, who were less likely to indicate that they had positive experiences of equity and well-being.

4. **Evaluate and improve knowledge mobilization strategies to ensure that students and parents are aware of the destreaming policy and its implications.**

More should be done to ensure that information about the destreaming policy is easily available and understood. Without this understanding, students are limited in their ability to make informed course selections. To provide equitable access to information about course options and their pathways to further education and careers, EDU and school boards should also ensure that guidance departments are adequately resourced. Guidance counsellors have a significant role in ensuring students understand the impacts of their course selections on their future opportunities. They also have an important role in the overall success of the destreaming policy. Ensuring that guidance counsellors are available so that all students can access their support when making course selections would contribute to the policy's goal to promote equitable access to PSE.

5. **Develop a provincial educational data infrastructure to facilitate evaluation of the outcomes of the destreaming policy.**

The provincial government should establish a provincial educational data infrastructure and make it available to school board research departments and educational researchers. Doing so will facilitate ongoing evaluation of destreaming supports. Such an infrastructure should include information on the uptake and use of province-wide supports, course grades, EQAO test results and PSE application and outcomes data linked with the Ontario Education Number (OEN). The race-based data school boards are now required to collect, in accordance with the *Anti-Racism Act, 2017* and Ontario's *Anti-Racism Data Standards* (Government of Ontario, 2022e) should also be included to illuminate equity issues and help identify where further support and attention is needed.

This data infrastructure would support longitudinal projects that monitor how policy interventions in the K-12 system impact postsecondary pathways and how they might be improved. Without province-wide data on where and for whom supports are available, we risk an inequitable distribution of resources. A provincial data infrastructure would ultimately allow for a more nuanced understanding of whether and how government investments in student supports for destreaming are working as intended, and what else may be needed to address any gaps.

* * *

HEQCO plans to continue to investigate the implementation of the destreaming policy as all Grade 9 compulsory courses are included. We will continue our work with the two partner school boards to next engage teachers and administrators in spring 2023 and gather their impressions of continued destreaming strategies. We will summarize insights from this engagement in a follow-up project.

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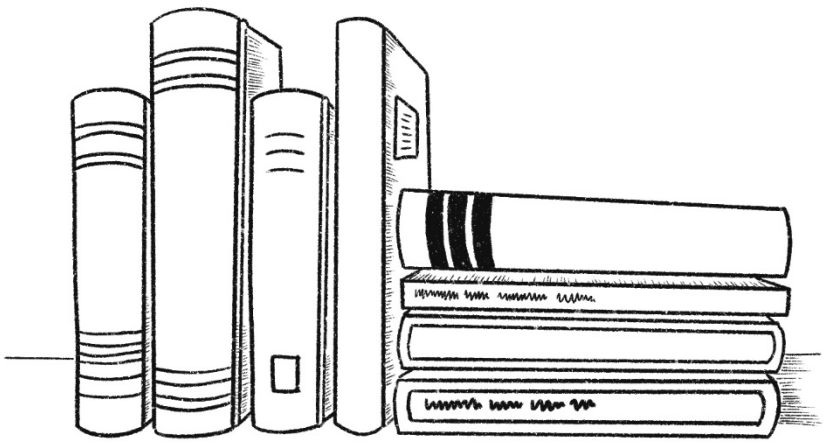

Analyzing Student Supports in Destreamed Math: Helping Students Succeed and Make Informed Choices About PSE

Appendices

Appendix A: Sample Characteristics

The following table outlines the student sample characteristics combined across both participating school boards.

Table A1

Sample Characteristics

Gender (n = 1,444)	
Male	49%
Female	47%
Non-Binary	4%
Race (n = 1,509)	
White	58%
BIPOC	42%
Born in Canada (n = 1,602)	
Yes	87%
No	13%
Time in Canada (1,250)	
10 years or fewer	11%
More than 10 years	89%
Exceptionalities (1,024)	
In the gifted program	10%
Has an exceptionality or IEP	18%
No exceptionality	72%

Note: HEQCO used the racial categories described by the Anti-Racism Data Standards in this survey, but we collapsed these into the categories “White” and BIPOC” due to small cell counts in certain categories. Students who indicated that they had an exceptionality or an Individualized Education Plan (IEP) are referred to as students with special education needs in this report.

Appendix B: Survey Questions

Below are survey questions from both boards that are relevant to the findings in this report.[23]

Table B1

Survey Questions

Survey Questions	Response Style
Have you taken Grade 9 math during the 2021-22 school year?	Y/N
What other courses are you taking during the 2021-22 school year? English (Applied, Academic, Locally Developed) Geography (Applied, Academic, Locally Developed) Science (Applied, Academic, Locally Developed) French (Applied, Academic, Locally Developed)	Matrix
Learning Strategies Course Questions	
Did you complete the Learning Strategies Course before taking Grade 9 math?	Y/N
In your opinion, did the Learning Strategies Course have an effect on how confident you felt in Grade 9 math? Yes, I felt much more confident. Yes, I felt more confident, but only somewhat. No, I didn't feel more confident. I'm not sure.	Select one
What parts of the Learning Strategies Course helped prepare you for Grade 9 math?	Open response
Did the strategies you learned in the Learning Strategies Course have an effect on how confident you felt in courses outside of math? Yes, I felt much more confident. Yes, I felt more confident, but only somewhat. No, I did not feel more confident. I'm not sure.	Select one
Compared to your other courses, how would you rate the difficulty of Grade 9 math? Very easy Easy Neither easy nor difficult Difficult Very difficult	Select one

[23] Additional anonymized survey questions are available through the authors.

Compared to your other courses, how did you find the demands of Grade 9 math? I felt like more was expected of me in Grade 9 math. I felt like less was expected of me in Grade 9 math. I felt like what was expected of me in Grade 9 math and my other courses was about the same. I'm not sure	Select one
Which math course do you plan to take in Grade 10? Academic Math (MPM2D – Principles in Mathematics) Applied Math (MFM2P – Foundations of Mathematics) Locally Developed Math (MAT2L1 – Mathematics) I'm not sure	Select one
What would you like to do after high school to further your education/career? Attend college Attend university Start an apprenticeship (for a trade) Enter the workforce Enlist in the Canadian Armed Forces Take a year off (or a "gap year") I'm not sure yet. I haven't thought about it.	Select all that apply
Student Support Questions	
Did any of these supports have an effect on how confident you felt in Grade 9 math?: Mathify, Knowledgehook, private tutoring outside of school (for example, from an individual, or from a program like Kumon or Sylvan), Desmos, support from family or friends, tutoring support at school Yes, it made me feel much more confident. Yes, it made me feel more confident, but only somewhat. No, it didn't make me feel more confident. I'm not sure. I didn't use this support.	Matrix – select one per support
If you used any other supports that made you feel more confident in Grade 9 math, aside from those listed above, please list them here.	Open response

What types of supports helped you in your math learning this year? Other teachers who regularly joined our class to help us Manipulatives (not digital/computer ones); e.g., algebra tiles, tangrams, fraction strips, coloured cubes, etc. Using an iPad or laptop Computer applications (apps); e.g., TVO Mathify, Desmos, Mathies, digital/computer manipulatives, etc. Participating in group work My parent(s) or guardian(s) My classmate(s) and/or friend(s) Resource room Working with a math tutor Other, please specify	Select all that apply
Do you think this statement is true or false?: This year's Grade 9 math course replaced the Academic and Applied math courses that were previously offered to Grade 9 students.	T/F
This year's Grade 9 math course did replace the Academic and Applied math courses that had previously been offered at all Ontario school boards. Why do you think this happened? Select any answers that feel true: The old courses were out of date, and we needed to learn new concepts. Students who took Applied math often did not have the same postsecondary and career opportunities as students who took Academic math. Having two courses (Academic and Applied) unfairly separated students from different racial, cultural and socioeconomic groups. The Academic course was too hard. The Applied course was too easy. None of the above	Select all that apply
When I am in my Grade 9 math class … I feel safe, supported and accepted. I feel free to be myself and communicate with others. I see different cultures and people's experiences represented in the math learning. I see myself represented in the math learning. I see how math is relevant and useful in the real world.	Matrix – agreement scale from Strongly disagree to Strongly agree
Who helped you choose your Grade 9 courses? My parent(s) or guardian(s) Another family member A Grade 9 teacher A guidance counsellor My friend(s) Nobody Other, please specify	Select one

Who helped you to choose your Grade 10 courses? My parent(s) or guardian(s) Another family member A Grade 9 teacher A guidance counsellor My friend(s) Nobody Other, please specify	Select one
Demographic Questions	
What is your gender identity?	Open text
Were you born in Canada?	Y/N
At home with your family, is the main language you speak a language other than English?	Y/N
How many years have you lived in Canada? All my life 1 to 2 years 3 to 5 years 6 to 10 years More than 10 years	Select one
How do you identify? Select all that apply: Black East Asian Indigenous (e.g., First Nations, Métis, Inuit descent) Latino Middle Eastern South Asian White Another identity	Select all that apply
Do any of the following apply to you? I have an identified exceptionality. I have special education needs addressed through an individual education plan (IEP). I am a gifted student. I'm not sure. No Prefer not to say	Select all that apply

Appendix C: Tables of Results

Table C1

Usage and Helpfulness of Supports at One Ontario School Board

Type of Support	Used	Found Helpful
Learning Strategies Course	14%	57%
In-School Tutoring	25%	60%
Mathify	25%	45%
Knowledgehook	29%	48%
Desmos	60%	60%

Table C2

Students' Plans for Grade 10 Math and After High School

	Plan for After High School			
Math Stream	**College**	**University**	**Haven't thought about it**	**I'm not sure**
Applied	41%	35%	15%	25%
Academic	13%	76%	6%	19%
I'm not sure	27%	39%	17%	30%