Exploring How Ontario Teachers Adapted to Learn-at-Home Initiatives During COVID-19: Blending Technological and Pedagogical Expertise in a Time of Growing Inequities

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Abstract

At-home learning initiatives arose as a response to school closures due to COVID-19. This study interviewed 17 secondary teachers to explore the implementation of at-home learning in the province of Ontario, Canada. Findings suggest four thematic areas arising from the data: growing equity disparities, poor policy communication, factors influencing successful emergency remote teaching (technological and pedagogical), and impacts to academic and socio-emotional/mental health. This article proposes an integrated model for school recovery that will engage three levels of the education system: (1) school-level efforts including high-dosage tutoring and teacher collaboration and teacher looping strategies, (2) building partnerships with community organizations for wrap-around support for the most marginalized communities, and (3) parental engagement through actionable messages and tips by text to help parents support student learning. In the end, Ontario teachers rose to the challenge of providing students with consistent learning during the pandemic.

The Challenge

On March 11, 2020, the World Health Organization declared COVID-19 a pandemic; schools around the globe began closing as a response (Viner et al., 2020). Many nations opted for a rapid

shift to emergency remote teaching (ERT) in order to keep students attending school (Doucet et al., 2020). These dramatic changes to teaching and learning at scale across national systems have put increased pressure on teachers to rapidly cultivate new skills and on families to quickly adapt to facilitating learning at home. The consensus of rapid research conducted to date is that the pandemic and the concomitant changes to teaching and learning have exacerbated educational inequities (Doucet et al., 2020; Dreesen et al., 2020; Kuhfeld & Tarasawa, 2020). Research is urgently needed to explore the shift to ERT in order to better understand the impacts of the pandemic on teachers, families, and students around the globe and also to inform strategic planning for education and school recovery after widescale vaccination (Education Endowment Foundation, 2020; Kuhfeld & Tarasawa, 2020; Tirivayi et al., 2020).

This study was conducted in Ontario, Canada, between March and April 2020, during the first wave of school closures. Two interrelated objectives were pursued: (1) to understand the challenges associated with ERT from the perspectives of intermediate and senior division teachers, and (2) to use these data to inform plans for education recovery in the coming years post COVID-19.

Clarifying terminology

Recent literature investigating COVID-19 and education has employed a diverse set of concepts. For example, it is not uncommon to read of *online learning*, *remote instruction*, and *distance education* (cf. Bozkurt & Sharma, 2020; Hodges et al., 2020). Notwithstanding the nuances of these concepts and their respective bodies of literature, the emerging consensus among education scholars and practitioners alike is that such concepts fail to adequately represent the COVID-19 context for teaching and learning. ERT, by contrast, has surfaced as a more appropriate concept that captures the educational circumstances facing schools, teachers, and students. Hodges et al. (2020) define ERT as follows:

> [A] temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances. It involves the use of fully remote teaching solutions for instruction or education that would otherwise be delivered face-to-face or as blended or hybrid courses and that will return to that format once the crisis or emergency has abated. The primary objective in these circumstances is not to re-create a robust educational ecosystem but rather to provide temporary access to instruction and instructional supports in a manner that is quick to set up and is reliably available during an emergency or crisis. (para. 13)

The fundamental notion of ERT is thus that it provides temporary relief for an unprecedented challenge—how to continue teaching and learning despite COVID-19, in this case.

Context: Ontario

Canada ranks well on the global stage for education (O'Grady et al., 2019). The Programme for International Student Assessment (PISA) is administered to member countries of the Organisation for Economic Co-operation and Development (OECD)[1] every three years, and as such, it remains a global benchmark of how nations are faring across reading, math, and science. The last PISA survey was conducted in 2018 (OECD, 2019), and Canadian students were among

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[1] The OECD is an intergovernmental organization with representatives from 38 member countries that develop economic and social policy.

the top ten countries for reading, math, and science and well above the OECD average (see People for Education, 2020).

Ontario, Canada's most populous province, contains approximately 40% of the Canadian population with 14.57 million people. The Ontario education system includes over 2 million students. K–12 education costs approximately $25 billion to operate annually. Ontario is organized into 72 school districts (850 secondary schools and 4,000 elementary schools), with 128,000 full time teachers and 7,500 principals and vice-principals (Ontario Ministry of Education, 2021). As a bilingual country and school system, there are four types of school districts in Ontario: English Public (N=31), English Catholic (N=29), French Public (N=4), and French Catholic (N=8). Secondary schools are streamed and include academic level courses (Grades 9 and 10) that move to university level courses (Grades 11 and 12), applied level courses (Grades 9 and 10) that move to college level courses (Grades 11 and 12), as well as locally developed level courses. Beginning in September 2021, school boards province-wide will end academic streaming for Grade 9 math courses; however, despite calls for de-streaming in all Grade 9 and 10 courses, there is currently no established timeline for when or whether that will be realized (see Pichette et al., 2020).

The Learn at Home initiative in Ontario

On March 20, 2020, the Ontario Ministry of Education announced school closures from March 14 through to April 5, 2020, in an effort to contain the spread of COVID-19 (Ontario Ministry of Education, 2020b) and launched the Learn at Home initiative. These closures also extended to private schools and all childcare centres. In this press briefing, the Ministry also noted, "For students who do not have access to a computer, work is underway, in conjunction with school boards, to provide the necessary technology to everyone who needs it" (2020b, p. 9). The next relevant policy announcement from the Ministry came on March 31, 2020, and provided further details on expectations for the Learn at Home initiative in Ontario, including a breakdown of hours per day by age group:

- Kindergarten-Grade 3: five hours per student/week (focus on literacy and math)
- Grades 4-6: five hours per student/week (focus on literacy, math, science, and social studies)
- Grades 7-8: 10 hours of work per student/week (focus on math, literacy, science, and social studies)
- Grades 9-12: three hours of work per course per week for semestered students; 1.5 hours of work per course per week for non-semestered students (focus on achieving credits/completion/graduation) (Ontario Ministry of Education, 2020a, para. 8)

In addition to specific guidelines on hours of learning by grade, the Minister of Education, Stephen Lecce, also announced that marks could not go down from where they were on March 12, 2020; however, grades could be improved during the Learn at Home initiative.

Connections to the literature

This study engages with two bodies of literature: (1) evidence-based practices for teaching and learning in online environments (Barbour, 2013; Cavanaugh et al., 2009; Means et al., 2009) and the connection with teachers' technological and pedagogical knowledge (Chai et al., 2013; Sahin, 2011; Schmidt et al., 2009); and (2) knowledge mobilization (research to practice)

approaches to inform educational change (Cooper et al., 2009; Decorby-Watson et al., 2018; Hemsley-Brown, 2004; Nutley et al., 2007), particularly the multi-directional flows of information between education research, practice, and policy contexts. Due to the unique educational priorities and circumstances of ERT, the theoretical and empirical understandings from these bodies of literature could not be directly imported to this study's context. Hence, while they informed the insights presented herein, this article is primarily data-driven.

The broader study interviewed 42 teachers (25 elementary teachers and 17 secondary school teachers) and 11 parents of elementary school students. This article focuses on the secondary school sample and reports on the perspectives of 17 teachers about their experiences implementing ERT in Ontario. The organization of subjects at the secondary level is greatly different from that at the elementary level, where teachers teach multiple subjects; as such, focusing on secondary school implementation was quite different than would be the focus on elementary school, where parents often had to facilitate learning among younger students, despite the fact that equity issues around technology, access, and identity characteristics were similar across both samples.

Methodology

This qualitative study explores the perspectives of intermediate and senior division teachers in Ontario in relation to two research questions: (1) What have been the impacts of ERT in Ontario secondary schools during COVID-19? (2) What factors contributed to greater challenges and/or successes for teachers and students during ERT?

Sample and data collection

Once the study had ethics board approval, teachers were recruited via Twitter. One-hour, semi-structured interviews were conducted with intermediate and senior division teachers ($N = 17$) during March 2020, soon after the initial lockdowns in Ontario had begun. Participants taught a range of intermediate (Grades 7–10) and senior (Grades 11–12) courses (Table 1).

Table 1: Participants, subjects, and grades taught during school closures.

Pseudonym	Subjects	Grades
Jodi	Math	10, 12
Helena	Math	10, 12
Joseph	Math	9, 10
Wanda	Math	9–12
Kiley	Math (Accounting), Phys Ed	11, 12
Kevin	French, Phys Ed	9, 11
Stuart	French, Law	9–12
Vera	English	9–12
Maryanne	English, Social Science	10, 12
Anna	English, ESL	10, 11
Martha	English, Library	9–12
Anita	Guidance	9–12
Robin	Music	11,12

Luke	Religion	10
Tim	Tech (Construction), Computers	9–12
Simon	All subjects	7, 8
David	All subjects	7, 8

The sample of Ontario teachers included five math teachers, two French teachers, four English teachers, two guidance teachers, a science teacher, a tech teacher, a music teacher, a religion teacher, and two middle school teachers who taught all subjects. The middle school teachers were included in respect of the critical perspective they could offer on students who would or will be making the transition to secondary school during the COVID-19 pandemic.

Semi-structured interviews lasting up to one hour were conducted over Zoom using a common interview protocol focused on the following areas:

- School and school board: (i) resources and supports, (ii) policy communication.
- Ministry of Education: (i) resources and supports, (ii) policy communication.
- Planning: How are teachers planning for ERT? How is this different from the ways in which teachers planned previously?
- Teaching and learning: Describe what ERT looks like (technology, pedagogical approaches, typical week).
- Assessment: How do you assess learning that takes place remotely? Assessment examples?
- What have been the impacts of ERT (for teachers, for parents/families, for students)? Biggest challenges? Successes?
- Transition back to in-person learning.
- Recommendations for improvement and support, short- and long-term, in relation to academic outcomes, socio-emotional/mental health for students.

Interviews were recorded and transcribed verbatim. Interview transcripts were uploaded to NVivo 12, a qualitative analysis software, to code for emerging themes and to identify similarities and differences across participants' perspectives.

Data analysis

A combination of inductive and deductive approaches was utilized to analyze the interview data. To ensure reliability and a systematic process to analyzing data from each participant, a coding manual was used. DeCuir-Gunby et al. (2011) highlight that codes emerge from three major areas: "Codes can be developed a priori from existing theory or concepts (theory-driven); they can emerge from the raw data (data-driven); or they can grow from a specific project's research goals and questions (structural)" (p. 137−138). The coding manual for this study was data-driven (after interviews were conducted) and structural in relation to our research goals of identifying challenges and recommendations for how schools might approach recovery across the education system when normal, in-person learning resumes.[2] MacQueen et al. (2008) suggest six potential

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[2] Even though in-person learning has resumed in Ontario, many restrictions based on health protocols still prevent group learning, the use of shared manipulatives (math), etc. As such, our recommendations are hopefully helpful in the next few years following global vaccinations as students and families attempt to bridge academic and socio-emotional/mental health issues that have been exacerbated by the pandemic.

elements for each code: (1) a code name/label, (2) a brief definition, (3) a full definition, (4) inclusion criteria, (5) exclusion criteria, and (6) examples. The codebook included the first three elements: code name, brief description, and full definition. By way of an example, the codebook included a code entitled "Negative Social Impacts" within the subtheme "Socio-emotional/mental health impact" (Table 2), which was described in brief as the unintended consequences of the Learn at Home initiative on students and their families. The methods to create the coding manual included nine steps: (1) creating the data collection instrument, (2) writing a detailed coding manual, (3) circulating the instrument and coding manual to a broader research team working on elementary school data for feedback, (4) refining the tool based on feedback, (5) piloting the tool across multiple raters on common interview transcripts, (6) meeting to discuss results, (7) refining categories where needed, (8) training research assistants on application of the coding manual, and (9) meeting to assess inter-coder reliability (Cohen's kappa) after 25% of the transcripts were coded.

Assessing inter-coder reliability

Two members of the research team coded the same five interview transcripts in order to refine thematic nodes and coding categories and calculate inter-coder reliability as represented by Cohen's kappa. Unlike other tests, Cohen's kappa takes chance agreement into account (Cohen, 1960). The value achieved in this study was .71, indicating *substantial* strength of agreement between the coders (Landis & Koch, 1977).

Emerging themes and subthemes

Thematic analysis resulted in four themes emerging from the data (Table 2): equity issues, policy communication and resources as barriers, factors influencing successful implementation being a combination of technological and pedagogical capacity in online learning environments, and the impacts of remote teaching and learning.

Table 2: Themes and subthemes arising from data analysis.

Theme	Subthemes
Equity Issues	• Accessibility (devices, internet). • Differential outcomes based on Identity Categories (socio-economic status, race and ethnicity, English language learners, exceptionalities). • Levels of parental support .
Policy Communication	• Policy by press conference. • Insufficient training and resources. • Lack of system alignment (between ministries−boards−schools) due to poor communication and lack of consultation with the sector.

Factors Influencing Implementation by Teachers	• Technological capacity.
	    o Comfort with learning platforms and apps (Zoom, Google Classroom).
	    o Previous experience teaching online.

	• Pedagogical capacity in online learning environments.
	  ○ Student-centred and collaborative learning activities.
	  ○ Assessment (feedback, formative/summative, grades).
	  ○ Student engagement.

Impacts	• Academic impacts (academic versus applied course levels). • Socio-emotional/mental health impact (students, families, teachers).

Findings

The findings are organized into the four dominant themes that emerged from the analysis (Figure 2): (a) equity issues, (b) policy communication and lack of resources (ministry–board–school), (c) factors influencing implementation by teachers (technological capacity and pedagogical capacity), and (d) impacts (academic and socio-emotional/mental health impacts for students and teachers).
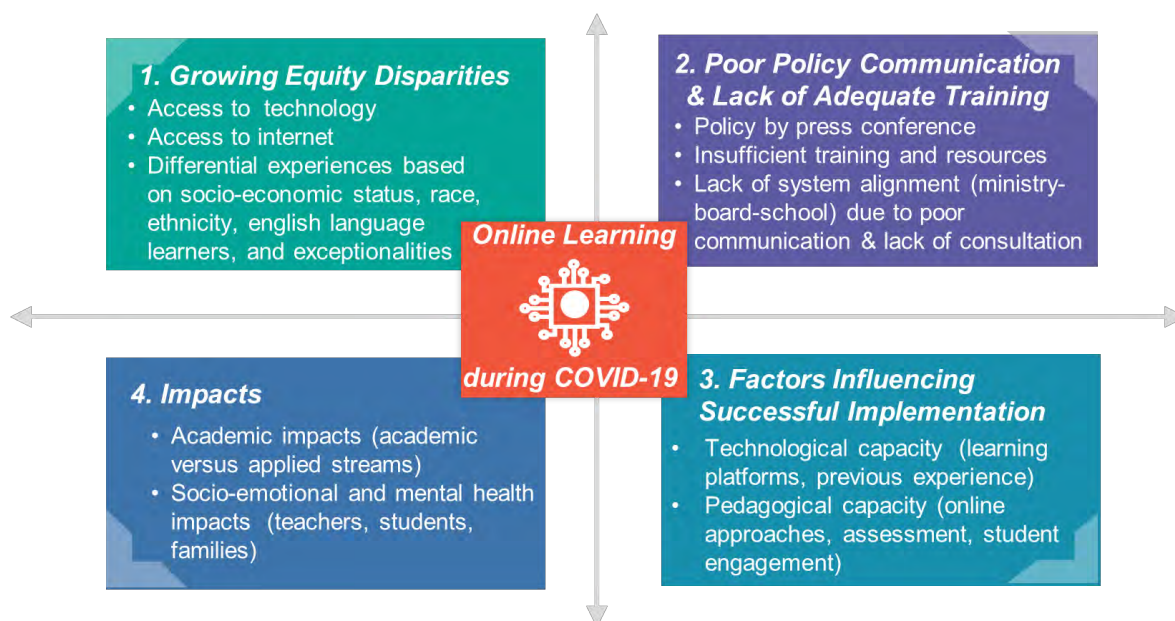

Figure 2: Dominant themes arising from interviews with teachers about the Learn at Home initiative in Ontario.

Growing equity disparities were teachers' primary concern

Growing equity disparities arose as the primary concern for educators during the Learn at Home initiative; it was mentioned at length by all 17 teachers interviewed. Issues emerging in relation to equity included access to devices, access to the internet, and communities disproportionately affected by COVID-19, such as low-income families, racialized communities,

and immigrant families whose children were English language learners. Teachers also spoke of students with exceptionalities, but this was in relation to unanticipated successes from ERT. Students with various exceptionalities such as anxiety or autism were in some instances faring better in online environments than in in-person classrooms. Each issue will be further explored through the views of participants.

The most prevalent barrier to learning was access to proper technology and the internet: "There are two major equity issues. The first one is the resource itself, like the computer and the device, whatever it is. And then the second one, which is outside of the power of the family, is access to internet" (Wanda, Grades 9–12, Math Teacher). School boards surveyed families to identify and address the need for devices and supply them where needed:

> I actually helped with the rollout of Chromebooks to our students. So, we distributed 35 Chromebooks to students as soon as we could. So, it was mid-April, and we rolled them out really carefully, like, found out who needed them. That was our very first priority, was contacting every single family, what do you need? And providing it for them. (Martha, Grades 9–12, Library and English)

In some areas, the distribution of technology was not done in a timely manner—students did not receive a device until halfway through April, weeks after the Learn at Home initiative was in full swing. Many students who lacked adequate devices attempted to complete assigned tasks with their cell phones, which were insufficient for full-time ERT. In other cases, due to lack of devices and access to online learning platforms, teachers had to pivot and create packages of learning worksheets and materials that were then left at the school for families to pick up. This process was complex due to stringent COVID-19 health protocols: "Accommodations were made for these students; paper packages were being put together, but the system of sending/receiving the work was delayed due to health procedures of COVID-19" (Anita, Grades 9–12, Guidance). Meeting the needs of different students and families thus required a combination of technological and paper-based strategies.

After devices had been distributed, another area of concern emerged: students' lack of familiarity with technology and parents trying to facilitate learning at home. As Jodi stated, "There's technology access, and also familiarity with the technology. So, as much as we handed kids a whole bunch of Pro Books, they haven't had them their whole lives. And so, they're on a learning curve as well. It's major" (Grades 10 and 12, Math). Moreover, students' devices at home were often shared by multiple individuals in the household, limiting the amount of time for students to engage in online environments. As Vera noted,

> The bulk of my learning community lives in a series of high-rise apartments around the school. They are usually first, or second-born Canadian, and it's a lot of large families in one- and two-bedroom apartments. So, you have a device, but you have … ten people sharing the one device. (Vera, Grades 9–12, English)

Internet access at home was another prevalent equity issue. Many families lacked internet access or did not have enough bandwidth for full-day streaming of learning. Teachers noticed that some students would come to the school parking lot and use the building's Wi-Fi to get to their coursework: "Like some kids I've heard will go to our school parking lot to get onto the Wi-Fi, so that's been an issue, and some kids might have a phone, but that's not workable for distance learning" (Anita, Grades 9–12, Guidance). There were also differences across the sample between teachers working in rural versus urban settings in relation to internet connectivity: "Access is huge.

Part of our school is very rural, and so they might have potential for access, but the actual network and signal is no good" (Anita, Grades 9–12, Guidance). Even with devices, affording the internet was beyond the means of some families:

> It's not equitable. Our board did try to provide Chromebooks, iPads to anybody that needed them.… But there's a student of mine that lives not too far from me. I don't even think it's a five-minute drive. And they don't have the same internet access to what I have. They're not able to afford it, because that's a whole other equity piece. It doesn't exist in that area, that pocket. (Robin, Grades 11 and 12, Music)

Luke even went further to say that education systems need to provide every student with a computer and internet based on the current societal climate, not merely due to the pandemic, but because of what 21st century learning requires: "No one wants to admit that the internet is a human right and that a computer is a consumable, like a pencil, or a pen, or a notebook" (Luke, Grade 10, Religion). However, equity issues extended beyond access to a device or the internet. The broader learning environment also precipitated various advantages and disadvantages for each student.

Many families also experienced financial hardships due to COVID-19 and layoffs due to businesses closing. For senior high school students, this often meant them getting a job at a grocery store or extending the hours of their part-time jobs to support their families. In other cases, it was a chance to work more and save for post-secondary education. As Maryanne highlighted,

> I think equity. Equity is the biggest one, because I've got students who are now working full-time hours and have been for months. You know, with their going away to post-secondary, how do you turn down an extra $4,000, $5,000, when their grade has been guaranteed? (Grades 10 and 12, Social Science and English)

Other students took on a caregiver role in their household for their younger siblings or grandparents, presenting yet another equity issue students were facing: "But in terms of equity, some of my students are looking after their siblings all day, and I can't imagine doing that, because I have my own kids, looking after them. Babysitting is hard work" (Kevin, Grades 9 and 11, French and Phys Ed).

Parental involvement was also widely variable based on socio-economic status and work demands. While wealthy parents often worked from home or had the resources to provide tutors or nannies to monitor learning, parents from poor communities often worked out of the home in front-line service delivery positions. Moreover, while some parents were highly engaged and on top of their child's learning, others could not provide such support, through no fault of their own. As Tim highlighted, there were two groups of parents:

> One would be the group that have behaved very much like you would expect them to behave. So, the active, involved parent that is still active and involved and engaging with the kid and what their work is. There's those that are not engaged at all on a normal basis, and they haven't changed. (Tim, Grades 9–12, Construction and Computers)

For some participants, the issues parents and students faced had clear disciplinary origins:

> I've gotten a lot of emails from parents, and a couple of emails have said, please give me a call when you have a chance, kind of thing, and those have been the ones that are trying desperately to help their kids and they don't know how. So, the Math has gotten to the point

> where it's beyond their ability. I don't expect them to remember how to complete the square.… They're panicking, because they can't help their kid, and their kid's panicking because they don't understand it. (Helena, Grades 10 and 12, Math)

All four math teachers in the sample echoed similar concerns from students and parents about supporting conceptual understanding of increasingly complex mathematical concepts.

Language was also a barrier to engagement in diverse school boards. Many teachers discussed English language learners and the challenges of communicating with parents who spoke a different language:

> No, but again, that's not because of lack of interest. It's, again, a language issue, it's a fear, I think, of trying to communicate with the teachers when they can't speak the language fully. Because they are parents that believe in the importance of school and are very behind having their students do well. (Vera, Grades 9–12, English)

In aggregate, many factors contributed to what teachers described as a widening equity gap between students, but they all appeared to share an origin in high versus low socioeconomic status. As Jodi lamented,

> It's anybody who already had all of the tools to succeed, all the good stuff that life hands you. They are the ones that are getting ahead. And everybody else who has been handed the shorter stick, they are for sure feeling that they have a shorter stick right now. (Grades 10 and 12, Math)

These widening gaps will need to be evaluated in the years to come as education systems transition back into learning post-pandemic. Equity has always been an issue in Ontario's education system; however, COVID-19 has shed light on the nature and scope of many deeply embedded inequities.

Poor policy communication and lack of training were obstacles to ERT

Many teachers spoke of the policy context that created confusion and a lack of alignment between the Ministry of Education and school boards, who regularly received information at the same time as the public through press conferences. Teachers also noted their frustration with the disconnect between statements published publicly as opposed to the messages they received directly:

> There's a lot of misunderstanding about the different communication, because we were reading it and seeing it as educators, and then parents and students were seeing it and reading it and interpreting it in a different way. And so, our school board tried to come out with a consistent message, and principals then communicated that to families as quickly as possible from when the Ministry announced it to when they were sending out their messaging. But there were a lot of inconsistencies because it could be interpreted. (Kiley, Grade 11, Accounting and Co-op)

The Ministry's policies on assessment were also identified as problematic, mainly on how students' marks as of March 13 would not go down. Teachers believed this policy announcement disincentivized student engagement. Students who already had received a course grade of 80 or

higher began to disengage quickly: "Kids … are just like, oh, I had an 85, that's an awesome mark, I'm just going to stop right there, why should I bother working so hard?" (Helena, Grades 10 and 12, Math). Teachers also noted that these marks, since the semester had only begun in February, were highly inflated, as they often represented a review of the previous year's content.

The Ministry was often changing its policies after the Learn at Home initiative was already underway, which prevented instructors from forming a consistent routine with their practice. Teachers attributed the lack of alignment between the Ministry and school boards to a lack of consultation and communication with school boards prior to releasing information to the general public; teachers felt such prior consultation should be happening. Teachers found that policies were changing too frequently:

> And I've been blindsided with all of this information that basically came out of nowhere. And the board hasn't had a chance to react. So, it would be nice if it said, "Oh hey, this press release is going to happen. Here are the general themes of what's going to be said, we're not going to tell you too much again, so we don't leak it to the media. But here is how you should be reacting if parents are asking question X, Y, Z. Here is how you can be preparing your students for this sort of thing." (Jodi, Grades 10 and 12, Math)

When a press release and a new statement would come out, teachers would begin to be bombarded with emails from students and parents whether these messages were true or not, and they simply could not answer because they were also hearing the messages for the first time. Many teachers were frustrated with the lack of consultation and communication around expectations for assessment, synchronous/asynchronous learning, and policies around online platforms (e.g., recording sessions, not being allowed to use Zoom a few weeks into the initiative). School districts were often left scrambling to interpret and operationalize the policies announced at press conferences:

> I definitely feel there is a huge gap between the Ministry and board. I feel like we're always the last ones to the party. Everyone's trying to decipher the language, but they make an announcement and there's no plan, there's no follow-up, it's just plan out like words out the door. Our board is trying to figure out a plan. They've come up with this learning plan and then trickling down the board. I think parents and students are recognizing it's not really our decision, but that we're trying to come up with a solution that is workable. We have solutions but we can't always put them forward because they come up with a new announcement. (Anita, Grades 9–12, Guidance)

Owing to the lack of transparency between the Ministry, boards, and teachers prior to policies being publicly announced, teachers reported feeling a lack of respect from the government when they were the ones actually having to implement these policies in real-time on the frontlines.

Many factors influenced whether or not teachers felt successful in their implementation of ERT

Teachers reported widely variable experiences implementing the Learn-at-Home initiative based on a myriad of factors relating to their technological and pedagogical capacity in ERT (Figure 3).
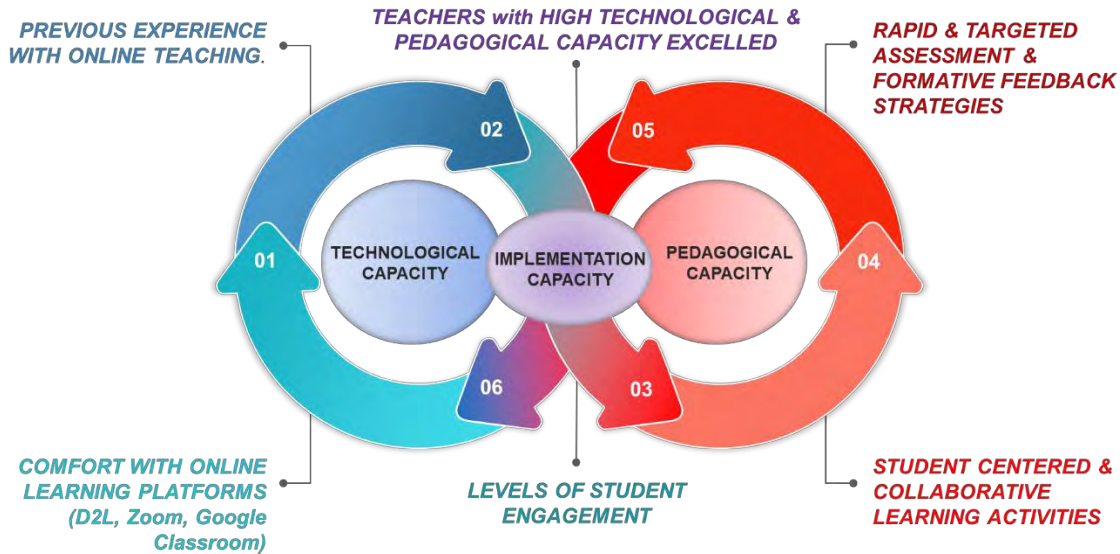
Figure 3: Success with ERT related to interactions between the technological and pedagogical capacity of teachers.

Technological capacity. Two dimensions contributed to teachers' technological capacity: their comfort and familiarity with online learning platforms and tools (e.g., Zoom, Google Classroom, D2L) and previous experience teaching online. Teachers' experiences were widely variable based on their self-reported capacity in this area: teachers with high technological capacity found the transition to ERT much smoother than those unfamiliar with the platforms. Several of the participants who were unfamiliar experienced mental health issues in relation to anxiety and workload based on the rapid shift to ERT without the requisite training and supports to be successful:

> For teachers that are not tech savvy, this has been really, really hard for them. There are some teachers that can send the email. When it comes to embedding a link into a document, they don't know how to do that. They're at a huge disadvantage. And then through this new element that we're working in, I think that's really hard for them. (Robin, Grades 11 and 12, Music)

Most teachers in the sample ($n = 16$) discussed an increased workload associated with ERT. Many were spending hours recording instructional videos for asynchronous use and adapting learning materials for online environments:

> I'm finding a lot of YouTube lectures. And then for them, it's debrief questions, it's reflection questions that they have to hand in. I'm doing a lot of Google forms, self-marking assessments. So, yes, it really kind of varies based on the topic. But I think most math teachers of the traditional math academic lesson, they are filming themselves, posting video, posting homework. (Jodi, Grades 10 and 12, Math)

A positive unintended impact of ERT was that the technological capacity of teachers skyrocketed during the pandemic, as they were forced to use online learning platforms and experiment with different apps and tools to facilitate more collaborative learning. While technological capacity is

a necessary baseline, pedagogical capacity and strategies of what works in online environments (including different mechanisms for assessment) were also needed for the successful implementation of ERT.

Pedagogical capacity. Factors related to pedagogical capacity include approaches to student-centred and collaborative learning activities and a shift from summative assessment to rapid and targeted formative feedback strategies, both of which contributed to higher (or lower) levels of student engagement. At first, many teachers were trying static approaches to learning (e.g., read something and post a response). However, as student engagement dwindled, the successful educators moved to activities that would promote peer-to-peer interactions; they realized that this was a major area that students were missing due to school closures—interactions with their friends. As Joe observed, more collaborative activities increased submission rates and engagement:

> I've done some group work which I've found, getting those kids that weren't handing in things, in a group work, they're actually contributing and doing something. I think they enjoy the group work.… The kids are all submitting things and they seem to enjoy it and I'm also hitting those kids that aren't necessarily submitting things. (Kevin, Grades 9 and 11, French and Phys Ed)

Other teachers discussed the positive interactions between students that were occurring in online environments. As Jodi expressed,

> I have seen a lot of really positive relationships build from peers helping peers that may have not happened in a classroom environment. Because if you don't sit beside somebody, it's hard to make an effort to go and talk to them. I've seen some peers really stepping up and answering questions, because they get it, and they can help people out before I can even reply on Google Classroom, for example. So, that's been awesome. (Jodi, Grades 10 and 12, Math)

Another factor that shifted dramatically due to school closures (and the announcement from the government that marks could not go down) was approaches to assessment. Simon, and many other teachers, were experimenting with different approaches to feedback:

> And the second biggest barrier I think is the ability to provide meaningful feedback to students, and so what that looks like for me and for my students has kind of been constantly evolving. So, for Math, what I do is I create a lot of Google Forms where after, you know, we do a concept or a lesson, it's kind of like an exit card. And then it's all multiple choice with provided options and then if they get the question incorrect, then it will be a video, like a video will automatically pop up with me explaining the topic a little bit more.

Teachers who experimented with rapid, targeted feedback, like the example above, reported greater success with implementing ERT and having students understand and engage more fully with the curriculum.

Impacts

Academic impacts. Teachers were very concerned with the academic impacts for students

that were not engaged with instructional materials. In their view, student engagement appeared related to the academic and applied streams. In many applied or college-level courses, less than 25% of students logged on or completed assignments, whereas teachers reported between 80% to 90% attendance and engagement from academic and university-level courses. Teachers were worried about how to address these learning gaps in the years to come, and this was especially true for the four math teachers:

> It's going to take, probably, a couple of years for them to catch up. I think it's going to be significant. It's going to take some time, we're going to have to go back, if I teach Grade 10 again, for example, I'm going to have to go back, probably, and teach a lot of Grade 9 concepts that didn't stick or they didn't get to or whatever. And so, that's going to take up time in our course, which will then move on to Grade 11, kind of thing. So, I think it's going to be significant, I'm a little worried. (Helena, Grades 10 and 12, Math)

The discussion provides strategies to address the negative academic impacts of COVID-19 for the students that were affected most during the pandemic.

Socio-emotional and mental health impacts for teachers and students. Teachers also spoke about the mental health issues that arose from lack of social interactions and also from COVID-19 affecting family members. Maryanne, for instance, shared the following:

> I've got students whose parents or grandparents have been affected by COVID. I've got students with mental health issues, who had only just returned back to the classroom for second semester, and then they haven't been able to cope well, and have completely fallen off the rails again. Undone months and months of work to get to where they were. It's been really tough trying to keep things as equitable as I can for students in all of those circumstances. (Grades 10 and 12, English and Social Science)

All participants felt that mental health would need to be a priority focus in the years following COVID-19.

Discussion

The discussion attempts to answer the following question: What approaches might mitigate the negative effects of school closures and ERT due to COVID-19 going forward in relation to academic impacts, impacts on families, and mental health impacts? Prior to exploring the many evidence-based approaches, it is essential to note that education systems will need data at multiple levels (district, school, classroom) to gauge where students are and to make decisions about curriculum and instruction. A system to target and support focal populations (e.g., English language learners, students with disabilities, families of low socioeconomic status) that have been most affected by COVID-19 is needed. Figure 4 suggests an integrated model[3] emerging from this study to address the negative impacts of COVID-19.

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[3] The model is in fact informed by interviews across the full study (26 elementary teachers, 12 elementary parents, and 17 high school teachers). However, even considering this broader sample, the model should be viewed as contingent upon the insights of further study with different education populations and in different educational contexts.
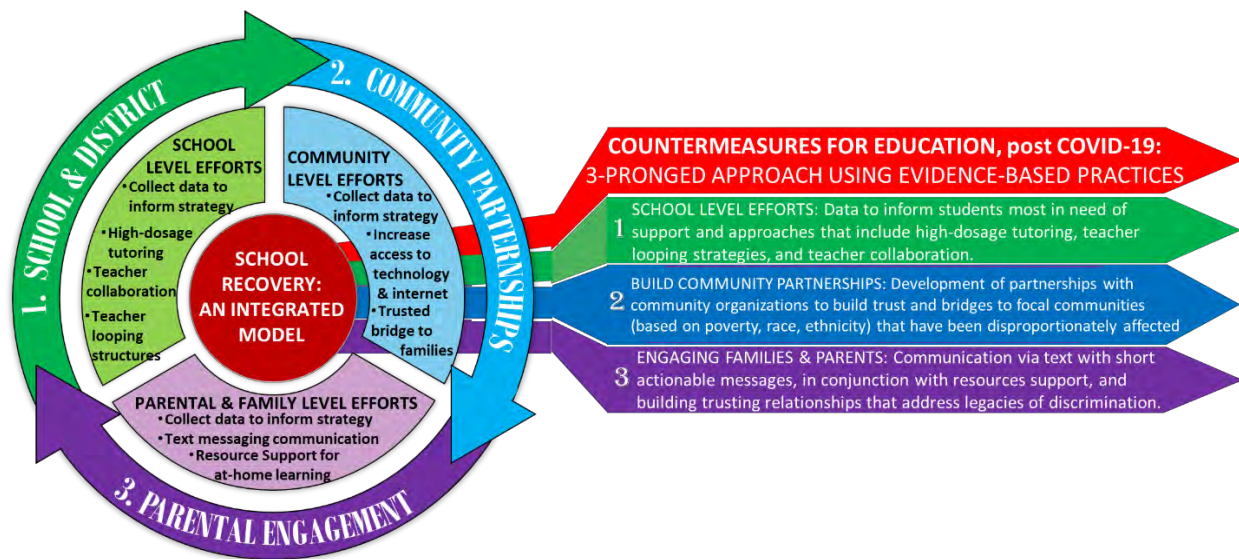
Figure 4: An integrated model for school recovery and to mitigate the effects of the pandemic.

School-level efforts to mitigate negative impacts from COVID-19: high-dosage tutoring, teacher collaboration, and teacher looping structures

Addressing negative academic impacts. A primary concern for teachers in this study was that students would be academically behind their indicated grade level due to less curriculum content being covered during ERT, and these concerns were most salient in relation to mathematics. Kuhfeld and Tarasawa (2020) refer to this as "the COVID-19 slide, in which students showed patterns of academic setbacks typical of summers throughout an extended closure and COVID-19 slowdown" (p. 2). Studies of learning setbacks suggest that although most students will experience learning loss due to the pandemic, i.e., a decline in academic achievement or learning progress (Campbell, 2020), most will still be operating within their grade-level content range. However, some groups—the most disadvantaged by the pandemic due to low socioeconomic status and other factors—will experience severe learning loss that will need to be urgently addressed (Allensworth & Schwartz, 2020). There is a large evidence base on targeted strategies to increase academic outcomes. The most promising is high-dosage tutoring (Allensworth & Schwartz, 2020; Robinson et al., 2021). High-dosage tutoring is defined as "more than three days per week or at a rate of at least 50 hours over 36 weeks" (Robinson et al., 2021, p. 2), and it is one of the few school-based intervention strategies shown to have significant positive effects on both math and reading. It is also an intervention that shows success at scale. Robinson et al. (2021) note "studies of 15 larger-scale tutoring programs serving between 500 and 7000 students still found that these programs generated meaningful gains" (p. 1). They go on to identify several important design considerations to consider for schools and districts to implement successful high-dosage tutoring after COVID-19:

- Frequency: three or more sessions per week in week-long, small-group programs taught by talented teachers.
- Group size: 3–4 students per tutor (moving beyond that shows fewer gains, and one-on-one is likely most effective but obviously more costly).
- Personnel: skills for tutoring are different than classroom teaching; as such, a wide variety

of tutors (including volunteers and university students) can successfully improve outcomes with training and support.

- Focus: tutoring is effective at all grades, but most effective for reading-focused tutoring between K–2 and for math with older students.
- Measurement: programs that support data use for ongoing informal assessments allow tailoring for individualized student needs.
- Relationships: consistent tutors over time might facilitate stronger relationships and a better understanding of students' learning needs.
- Curriculum: high quality instructional materials aligned with classroom content reinforces and supports classroom instruction.
- Scheduling: interventions during the school day are more effective than after-school or in the summer.
- Delivery mode: most research has focused on in-person tutoring, but emerging evidence suggests remote delivery can also be effective.
- Prioritization: negative stigmatization can occur when targeting lower-performing students; as such, broader school commitment can improve the perception that tutoring is for everyone (but the broader focus is more costly) (summarized from Robinson et al., 2020, p. 1).

Targeted interventions are undoubtedly needed to address the COVID-19 slide, so teachers and schools will be tasked with identifying which students need these supports most and how best to focus limited resources.

Lynch and Hill (2020) provide two additional strategies for the organization of teaching that should be integrated to support school recovery: collaboration among teachers for students needing wrap-around support and teacher looping strategies. Scheduling time to collaborate across subject-level teams can maximize efforts to support students. Teacher looping strategies keep students and teachers together more than one academic year in order to deepen trusting relationships and diminish the need for each new teacher to start from the beginning with identifying and implementing support strategies.

Addressing socio-emotional and mental health impacts. Schools will also need a plan to assess and support mental health needs. Hough and Witte (2021) highlight that the pandemic has caused widespread disruption to students' mental and emotional health, and as a result, schools will need to place greater emphasis on well-being. Well-validated tools exist to assess the mental health of students (such as student mindsets and circumstances), but in addition to collecting that data, investments must be made for tiered referrals to specialized services where necessary (Hough & Witte, 2021). Hough and Witte propose 3Ms for metrics that will be needed to address these issues:

- Meaningful: metrics that predict outcomes (such as health and safety in home environments, emotional well-being, and access to online learning environments).
- Measurability: new challenges exist around construct validity, and reliability as in-person assessments and performance assessments might no longer be possible.
- Malleability: (the construct can be shaped by educator interventions) is more important after the pandemic so that new data can change outcomes and leverage student strengths (summarized from Hough & Witte, 2021, p. 3).

Mental health will remain a primary concern as education systems grapple with the effects of COVID-19 in the years to come.

Building partnerships with community organizations to increase access to technology and the internet and acting as credible messengers to build trust with families

The pandemic has revealed stark disparities across communities, and many of those most affected are not easily engaged by schools. Murray et al. (2021) advocate for an approach that identifies community organizations that can be leveraged in partnership to better serve families and students (including basic family needs, technology access, childcare, and academic interventions). Schools will need to build partnerships—and also provide resources—for community organizations to engage with recovery efforts: "The demands of schooling during the pandemic exacerbated existing systemic barriers to learning including poverty, inequitable distribution of researchers, and racial, ethnic, economic and ability bias" (Murray et al., 2021, p. 2). These community partnerships will not necessarily focus on academic support but on helping families access food, technology, and in some cases mental health supports. Across the sample, access to the internet and devices was a primary concern. UNICEF has highlighted that access to technology is one of the most prominent barriers to student success (Winther et al., 2020). Governments and school districts need to consider supplying students with laptops and tablets as a foundational piece to 21st century learning. Similarly, partnerships with internet providers might allow targeted support for internet at home for families that cannot afford it. Even with funding to provide internet access, Murray et al. (2021) note that facilitating this process administratively is a challenge. Engaging community organizations and equipping them with the funds to facilitate this administrative work "frees districts up to focus on core functions like academic and mental health supports for students" (p. 2). Community organizations can also help schools build more positive relationships with families and parents who have been most marginalized by the education system.

Parental engagement using evidence-based communication strategies in conjunction with take-home resources where needed

Engaging parents will also be an essential piece to education recovery after the pandemic. Hill and Gayle (2020) stress that building trust will be needed with some communities due to legacies of discrimination and marginalization based on poverty, race, and ethnicity. Parents report that school personnel have deficit perspectives on both parents' willingness and capability to help their children excel academically (Hill & Gayle, 2020). To address this, communication strategies with families need to be regular, well-timed, and (most importantly) include actionable support strategies (Hill & Gayle, 2020). Programs that used text messaging as a form of communication with one sentence support messages show promising efficacy (e.g., setting a weekly goal on time spent reading to students), as do weekly alerts about missing assignments for increasing project submission rates and grades. Researchers have also explored the optimal timing to send these messages: for low-performing students, texting families on the weekends was more effective, whereas for high-preforming students, texting parents during the weekdays was better (Hill & Gayle, 2020). In addition to structured communication plans to engage parents and guardians, schools will need to provide necessary resources for at-home learning (ranging from books to laptops and other materials such as calculators). Parental and familial engagement will remain an

important focus of a robust school recovery plan after COVID-19.

Conclusion

This study explored the views of 17 intermediate and senior division teachers on ERT initiatives within Ontario. Despite growing equity gaps, teachers did their best under incredibly challenging circumstances to adapt their teaching to suit learning. The ethic of care for their students was evident in every interview. The integrated model proposed for school recovery will require continual refinement through further study with diverse education populations (e.g., school administrators, parents, students) and in varied educational contexts. However, it is a productive addition to ongoing efforts at the school, community, and parental levels in Ontario to mitigate the adverse effects of the pandemic on students and families, especially those from marginalized communities.

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