

# Intelligence MEMOS



From: Phil Oreopoulos  
To: Canada's Ministries of Education  
Date: March 30, 2020  
Re: **AN EVIDENCE-BASED APPROACH TO EDUCATION DURING A PANDEMIC**

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The physical closing of schools is among the unprecedented COVID-19 disruptions across the world. Schools across Canada are planning to keep doors shut to millions of students until at least summer, and some indefinitely.

Multiple [studies](#) have shown that academic progress stalls consistently over summer breaks, suggesting that the current isolation will be no different without alternative action. Disadvantaged students from lower socioeconomic backgrounds may be particularly harmed from a prolonged recess.

This makes the need to substitute to some other form of learning urgent. School boards are scrambling, but face many hurdles in developing strategies to deliver education. Among them: inexperience using online resources, hardware and software availability, anxiety, stress, and lack of Internet availability.

Adopting new education technology will play a role, though many educators and parents are being left on their own to sift through its many forms, not all of which are created equal.

Fortunately, convincing research exists to help make sense of how to proceed.

Last year, my co-authors and I conducted a [systematic review](#) of 126 randomized controlled trials examining the effectiveness of many different kinds of EdTech interventions.

Here are some conclusions for making evidence-backed decisions about how to switch to E-learning effectively.

First, one particular type of intervention stood out for improving academic achievement across a wide range of programs and settings: Computer-assisted learning (CAL) programs, defined as educational software designed to develop and practice skills, such as reading and math.

Effective CAL programs that have been rigorously evaluated typically share a few common features. They allow students to review classroom instruction while receiving interactive support at home. Students can watch online or tablet-based instructional videos and proceed through exercises at their own pace, much as with a tutor.

Students can proceed incrementally, retaking quizzes until mastering the material. Or, teachers can 'flip' their class, and ask students to watch the videos and work through exercises, while using data about how well they are progressing to offer student-specific support.

An example of a promising evidence-based CAL program is [ASSISTments](#), a free online math homework platform that provides students with immediate feedback and support as they solve problems. Multiple randomized evaluations of ASSISTments over different grades and regions reported impressive academic gains. One [study](#) found significant improvement even while students used the program for less than an average of 10 minutes per night, three to four nights per week.

[Khan Academy](#) is another free CAL program that provides children with personalized feedback. Featuring a library of courses across subjects and levels, it enables teachers to assign tests that differ for each student and grade. Students can practice at their own pace before moving through new content. In response to the pandemic, Khan Academy has released [daily schedules](#) for students and [resources](#) to understand how to use its platform effectively.

A second conclusion from our research review is that online education is more productive when made interactive or combined with incentives to learn.

Students watching passive educational videos, such as those offered on [Ontario's 'Learn at Home' website](#), are easily distracted and unlikely to retain content in the long-run. Studies of Massive Open Online Courses (MOOCs) show that, no matter how awesome the video content, few students actually get past the first few lectures.

Assignments that get students to react to videos, through grade incentives or online discussion, can ensure that students process the material.

Lastly, families from less advantaged backgrounds are more adversely hit from online only education due to lack of Internet and computer access. Only about 70 percent of households earning less than \$25,000 have access to a computer, and frequently also lack broadband access.

The solution is not to deny online education to all students. Rather, the solution is to mobilize resources. Many school boards, such as Hamilton-Wentworth, are [making arrangements](#) to loan or give tablets and Internet access to those in need, sometimes working with corporate and government partners.

It will take time to sort through what works best, but a silver lining of this massive enforced experiment is that we may discover more effective learning strategies.

By adopting an evidence-based approach to education technology, teachers and parents have reason to be hopeful that students at home can continue to learn, and even thrive, during these uncertain times.

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