**Unintended Consequences of High-Stakes Testing on Science Education**

In Ontario, the EQAO, an assessment of reading, writing and mathematics, is a well-known example of a high-stakes test. The intended purpose of the EQAO is to support student learning, improve student outcomes and ensure the quality and accountability of Ontario’s public education system (Education Quality and Accountability Office, 2021). Unfortunately, the emphasis that assessments like EQAO place on literacy and numeracy have the unintended consequence of negatively impacting student achievement in other subjects, like science, as Fazio and Karrow (2013) described. I’m arguing that in addition to the problem of student achievement in science, high-stakes tests have also had an unintended consequence on the time and resources allocated to science education both in elementary schools and in preservice teacher education.

Since high-stakes assessments act as an indicator of teacher and student success, schools have an incentive to allocate extra time and resources towards mathematics and language and away from low-stake subjects like science (Upadhyay, 2009; Winters et al., 2010). As a result, funding for lab equipment that would allow students to participate in hands-on science learning is low, leading some teachers to “dumpster diving,” purchasing resources with their own money, or simply doing without (Quinn, 2016).

To continue, the Ontario Ministry of Education (2009) explicitly promotes prioritizing uninterrupted literacy and numeracy blocks when creating a timetable. In 2016, the MOE introduced *Protected Time for Daily Mathematics Instruction*, a policy which states that schools must allow for 300 minutes of mathematics instruction per school week. No such policy currently exists for science education in schools. I saw the prioritization of high-stakes subjects reflected in the amount of time each subject was allocated in the class schedule during my teaching blocks (see Table 1). Respectively, language and math were allotted 5x and 2.5x more space in the weekly schedule than science, echoing Winters et al.’s (2010) finding that time in schools is being redirected to high-stakes subjects.

**Table 1**

*Time Allocated Per Subject, Per Week*

|  |  |
| --- | --- |
| Subject | Time Allocated Per Week |
| Language | 600 minutes |
| Mathematics | 300 minutes |
| Religion | 160 minutes |
| Social Studies | 120 minutes |
| Science | 120 minutes |
| Health & Phys. Ed. | 80 minutes |
| Music or Drama | 40 minutes |
| Visual Arts | 30 minutes |

*Note.* Taken from the weekly schedule of a Grade 3 class at a publicly-funded school in Ontario.

Many teacher education programs also reflect the lack of time directed to school science education. At Brock University, teacher candidates in the Primary/Junior stream take half as many science education courses as they do literacy and numeracy-related courses. Unfortunately, this leads to yet another unintended consequence for elementary students. Many teacher candidates will leave the program without the confidence and background knowledge necessary to teach science successfully. Grinell and Rabin (2017) explain that when beginning teachers have low self-efficacy in their ability to teach science, they’re more likely to spend less time teaching science or avoid it altogether if possible. If our teachers feel unprepared to teach science, the quality of their instruction and their students’ achievement will suffer. Providing teacher candidates with the opportunity to develop their knowledge and confidence in science education during their program would positively impact their students.

In conclusion, high-stakes literacy and numeracy testing have had the unintended consequence of less time and resources directed to science education in elementary schools and teacher education programs. Ultimately, without adequate funding and time allocated for science in the classroom, the current issue of lowered student achievement will not improve.

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