Abstract

Title: Mathematics and the English Language Learner

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Increased immigration and a move for greater inclusion in Canadian English language mainstream classrooms has led to increased numbers of English-Language Learning (ELL) students in our core subject-area secondary mathematics classrooms. The increasing number of ELL students in these classrooms has led to an increased demand on behalf of their mainstream secondary mathematics teachers to make accommodations in how they approach these students.

A lack of resources and literature summarizing the research relating to the instruction of ELL students in mathematics, and difficulties in accessing the available material relating to this topic by secondary mathematics teachers was thereby identified and deemed to be an area of need which should be addressed by this project.

To make the information quickly and readily accessible, the author endeavoured to create a resource on the Internet, presented in the form of a blog. In preparing the blog, a database of 217 research articles (including some secondary resources) relating to the instruction and assessment of ELL students and the challenges they face in mathematics were gathered, compiled, coded and organized by theme. These themes were later used in the blog as a means of presenting the material in a clear, organized and detailed manner.

In the review of the literature, the author presented several arguments which are summarized below. First, mathematics teachers need to be aware that ELL students are a group which are at risk of not completing secondary education. Second, the time needed for ELL students to master academic English is lengthy and should not be rushed by their mathematics teachers. Third, mathematics teachers need to be able to adapt to both the needs and the resources that ELL students bring to their classrooms – that is, each ELL student will be a unique case unto themselves bringing their own challenges and resources into the classroom. Fourth, the issues and idiosyncratic nature of the mathematics register poses unique challenges for ELL students and it is an issue that mathematics teachers need to be aware of when instructing ELL students. Fifth, alternative and tangible means of communication which can be used when instructing ELL students, outside of verbal language was considered and weighed by strengths and weaknesses. The benefits of cultural references and the dangers of educational tokenism were also addressed. Sixth, nonverbal language and the significance of contextual cues were identified as key factors when instructing/teaching mathematics to ELL students. Seventh, accommodations for mathematics exams were identified with simplified English and the use of glossaries or dictionaries were deemed noteworthy. Eighth, code-switching, language switching and exploratory talk were found to be important for ELL student progress in mathematics. Eighth, ELL students’ problems relating to reading in mathematics (especially word problems) were addressed – including vocabulary, syntax and visual cue issues. Ninth, a balanced approach lying between direct instruction and cooperative learning was found to be successful in teaching ELL students. Tenth, and finally, the importance of the role of parents and community in the success of ELL students in their mathematics classes was also identified.

In conclusion, this project sheds some light on the neglected research area of mathematics education as it relates to the instruction of ELL students in the mainstream secondary mathematics classroom. Plus, the blog created may offer guidance to both mathematics teachers and researchers in the realm of mathematics instruction and classroom assessment of English language learning students.