

A CULTURALLY SENSITIVE INTERVENTION FOR SYRIAN REFUGEE CHILDREN WITH INTERRUPTED SCHOOLING: TARGETING MATH VOCABULARY AND ASSOCIATED NUMBER SENSE SKILLS

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WHAT THE RESEARCH IS ABOUT

OBJECTIVE: In the first phase, the objective was to find out how best to support Syrian refugee children in addressing gaps in their math knowledge. The next phase focused on the development of an experimental measure (Mathematics Vocabulary Measure) to measure students' knowledge of mathematics academic vocabulary. The final phase was the implementation of a systematic math program with a focus on math concepts and math vocabulary.

RESEARCH JUSTIFICATION: For ESL and non-ESL learners, mathematics vocabulary can be a barrier to learning and progressing in mathematics. Limited research is available on mathematics skills of vulnerable refugee children who need to learn academic subjects in their second language (L2), and who, as is the case with Syrian refugee children, have suffered from interrupted schooling.

PRACTICAL GOAL: This study developed an effective intervention for enhancing students' mathematics academic vocabulary, thereby improving their overall math skills and academic development. The study also produced a validated measure of mathematics vocabulary - the Mathematics Vocabulary Measure (MVM).

PRIMARY AUDIENCE: Educators, policy makers, and service providers.

HOW THE DATA WAS OBTAINED

The MVM was tested against the Peabody Vocabulary Test (PPVT) to determine validity. The after-school math vocabulary program was implemented at a school in Toronto serving many immigrant and refugee children. The design was a pretest- intervention-post-test with a wait-listed control group. The sample included thirty-nine third-grade elementary school students. Teachers nominated children they perceived as vulnerable and believed could benefit from the math intervention. Seventeen were ESL students and twenty-two spoke English as their first language. During the intervention, student's scores were analyzed at three time points using two-way, repeated measures ANOVA (with time and group as the two independent variables).



CALL TO ACTION

- The Mathematics Vocabulary Measure (MVM) should be further tested in different populations and translated into different languages in order to compare students' math knowledge in their first language and in English.
- Further research should be conducted to determine the effectiveness of an after-school mathematics intervention based on building mathematics vocabulary. This should involve larger samples, the collection of background information, and careful assessment of cognitive and language skills as well as math achievement tests.

WHAT THE STUDY FOUND

- The MVM was tested against the PPVT, and it was found that the two measures are positively correlated $r=.49$, $p= 0.01$ (2-tailed).
- In the after-school intervention, the intervention group improved significantly on the MVM compared to the waitlist group, who did not improve at all during the first semester on their familiarity with math vocabulary. There was also a significant effect of time, showing that participants in the after-school program increased their knowledge of math vocabulary during the entire study.

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ABOUT CYRRC

The Child and Youth Refugee Research Coalition (CYRRC) is a network of researchers, service providers, and government partners working together to produce and share research that facilitates the integration of young refugees and their families in Canada and beyond.

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