



ONTARIO PUBLIC
SCHOOL BOARDS'
ASSOCIATION

Leading Education's Advocates

EFFECTIVE PRACTICES IN ELEMENTARY MATHEMATICS EDUCATION

School Board **Rainy River District School Board**

Contact Person and Email Address _____

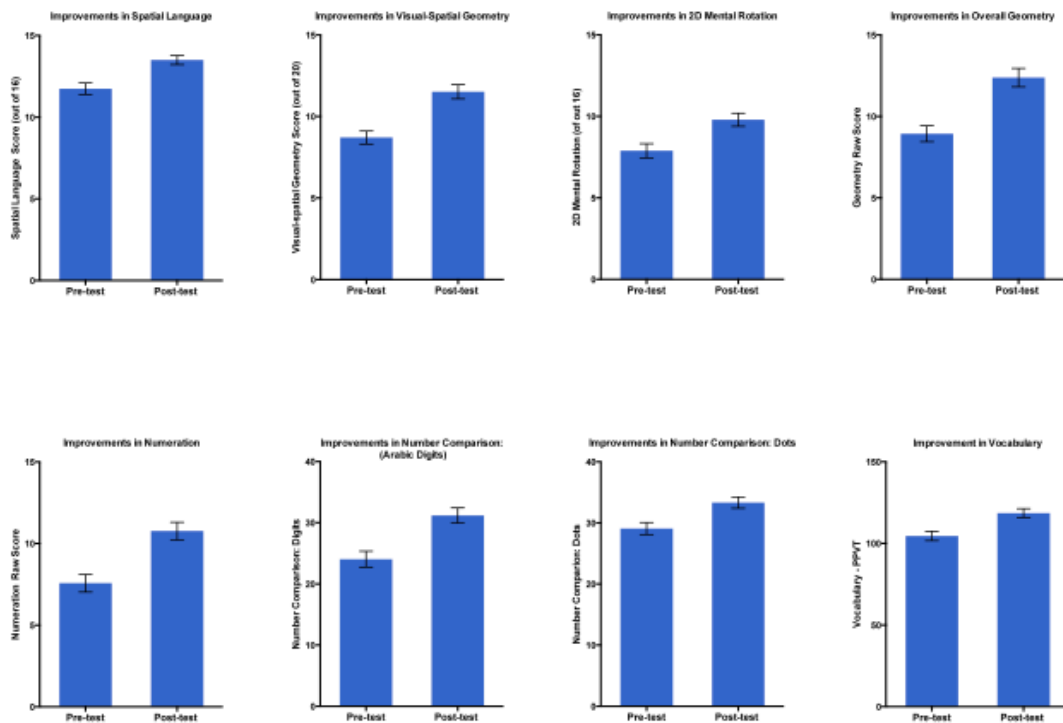
Name of Program/Initiative/Strategy_ **Math for Young Children**

Hyperlinks to Documents or Website(s) Describing this Program/Initiative/Strategy

Description of Program/Initiative/Strategy

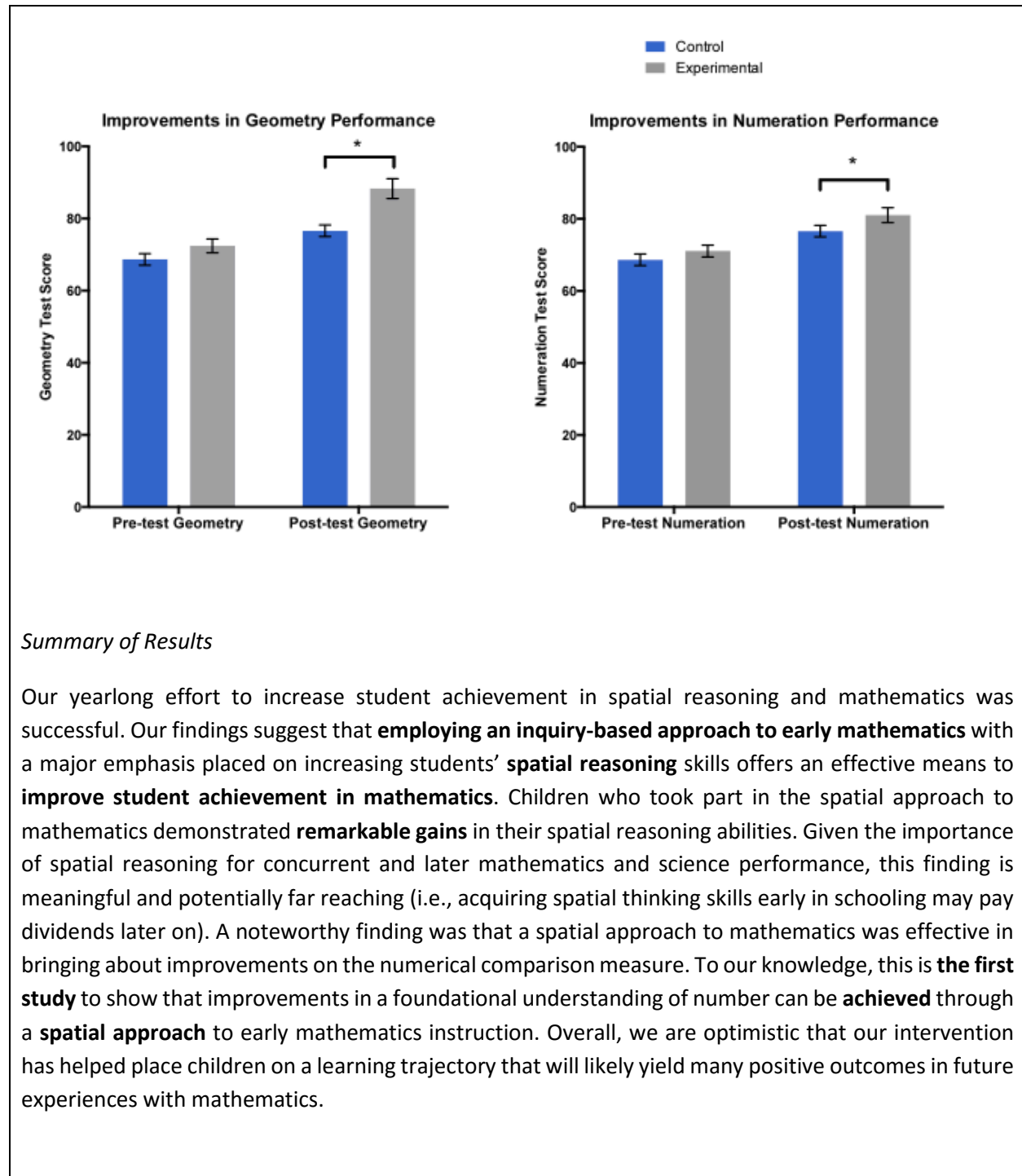
The focus is on exemplary mathematics practices that excite, engage and increase student confidence and achievement. In the brief description please provide answers to the following questions: Where the program/initiative/strategy is delivered (school/board locations)? Who is responsible for delivering and monitoring the program/initiative/strategy? Who is the target audience? Are there any community partnerships involved? Are there any staffing or budget implications? Are there any special resources required? What are your indicators of success, etc.?

We are delighted to present our exciting research results from our work in Kindergarten to Grade 3 classrooms in 5 schools that serve 6 First Nation communities. The following graphs show the impressive **overall improvements** from pre-test to post-test **on all eight measures**. On every measure, children demonstrated **statistically significant** improvements.



To further determine whether these improvements were merely a result of development and not necessarily a consequence of the seven-month PD intervention, we carried out analyses on the two KeyMath measures and compared performance and growth between the students that we worked with to matched controls (i.e., average Canadian child of the same age). In the following graphs, you can see that at pre-test the experimental group (children we worked with) did not differ significantly from the control group (i.e., typical Canadian child of the same age). That is, at the beginning of the year, there was no difference in performance between the children we were about to work with and the average child of the same age. In statistical terms, both groups of children might be considered as coming from the 'same population.' However, as you can also see in the graphs, a **significant difference between the groups** was present at the end of the year (post-test). Children in the experimental classrooms **significantly outperformed** the expected performance for their age. In statistical terms, the two groups of children (experimental vs. control) would be considered coming from 'different populations.' Thus, there is evidence to suggest that the intervention (seven-month Robertson Program math PD) had a **significant effect on students' overall performance in both Geometry and Numeration**. In summary, while the children we worked with began the year within an expected range of performance, by the end of the year, the children we worked with were performing at a level significantly higher than could be expected.

What has been the impact on Student Learning?



Summary of Results

Our yearlong effort to increase student achievement in spatial reasoning and mathematics was successful. Our findings suggest that **employing an inquiry-based approach to early mathematics** with a major emphasis placed on increasing students' **spatial reasoning** skills offers an effective means to **improve student achievement in mathematics**. Children who took part in the spatial approach to mathematics demonstrated **remarkable gains** in their spatial reasoning abilities. Given the importance of spatial reasoning for concurrent and later mathematics and science performance, this finding is meaningful and potentially far reaching (i.e., acquiring spatial thinking skills early in schooling may pay dividends later on). A noteworthy finding was that a spatial approach to mathematics was effective in bringing about improvements on the numerical comparison measure. To our knowledge, this is **the first study** to show that improvements in a foundational understanding of number can be **achieved** through a **spatial approach** to early mathematics instruction. Overall, we are optimistic that our intervention has helped place children on a learning trajectory that will likely yield many positive outcomes in future experiences with mathematics.