MiSA
Ottawa Region

Key Points

- HLM is ideal for exploring the impact of students' background, and classroom and school practices on students' educational outcomes.

- Students' backgrounds and experiences are very important predictors of their academic success.

- The teacher students have or the school students attend can make a difference to their academic success. We do not yet know what practices create these differences.

Hierarchical Linear Modeling

Those interested in school effectiveness research are looking for ways to explore the effects of school policies and teachers' practices while also recognizing the differences in the groups of students that communities, schools and teachers serve. Hierarchical linear modeling (HLM) has become an important technique in educational research. HLM allows the researcher to examine factors that predict students' educational outcomes, but more importantly it separates the students' background factors from those associated with the school, enabling a more fair exploration of the differential impact of schools. Any attempt to compare schools without the use of HLM will likely produce an unfair comparison because the comparisons will not account for differences in the student populations.

Researchers using HLM have determined that students' backgrounds and experiences are extremely important predictors of their success in schools. We know from previous research that over 75% of the differences we find in students' status, family background, access to resources, attendance and educational related activities. We know there are other important student variables but we are still looking for those. The teachers that students have and the schools that students attend are also important, but not nearly as important as the student factors above, and this is especially true in Canada. Further, we are only beginning to understand those teachers' practices and schools' policies that best support students' learning.

What have we learned from local research using HLM?

Recent research in the Eastern region of Ontario used HLM to explore those student and school factors that would predict students' achievement in language arts, mathematics, science and their EQAO results. The findings were similar to previous research. On average, girls had slightly higher marks in language arts, while boys had slightly higher marks in math and science. Similar trends can be found on the EQAO assessments in reading, writing and math. Not surprisingly, students with an IEP have lower marks, while students with two parents have slightly better marks. Interestingly, immigrant students in Eastern Ontario are doing quite well academically, receiving slightly higher grades than non-immigrant students. Students' work habits are also important predictors of their marks, although they are not as strongly associated with EQAO achievement.

We have much to learn about how schools in eastern Ontario differ in terms of student achievement. Consistent with other research, school and class sizes did not seem to have an impact on students' achievement, although we must remember that class sizes are now quite similar across the province. However, we need to obtain information about teachers' and administrators' practices if we want to better understand how educators can best support students' learning. Once we have a better idea of actual school practices and policies, HLM will be an even more important tool in our ongoing efforts to help our students be successful.

Questions Raised

- We know very little about those teachers' practices and school policies that separate effective from less effective teaching and schooling. How do we get this information to continue to develop our education system?

- What information can teachers and administrators provide that can be used in future HLM research? How can we encourage educators to provide this information?

- How can educators help reduce achievement gaps associated with students' background (e.g., gender, IEP status)?

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