Learning Mathematics in English: ESL and Non-ESL Students’ Perspectives

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Dissertation Abstract

This qualitative study explores Latino ESL and non-ESL students’ learning experiences when attending English-taught mathematics classes. The study was conducted in an inner city high school in central New York. The research design was based on modified analytic induction. I observed and videotaped two algebra classes, interviewed the algebra teachers, ESL teachers, and nine students (ESL and non-ESL) from the algebra classes. The study focused on: (a) student procedural and conceptual understanding and ability to communicate mathematically, and (b) student experiences that influence their education.

Findings of the study are: (a) the algebra teachers implemented traditional strategies that promoted instrumental learning, (b) ESL students were also taught instrumentally by their ESL teacher, and (c) most ESL and non-ESL students held only instrumental knowledge and had difficulties to communicate mathematically. Limitations in English language were only partially responsible for ESL students’ poor development of a mathematics register.

Based on the data, I defined the concept of student’s support network as the network of relationships that impact the student’s education. I developed a framework for analyzing such networks composed by six emerging categories of support received by students: affective, academic, English, social/cultural, multiple, and across the network support. Support networks include the student voices into the analysis, by looking across contexts through the student’s relationships.

Built on my data, I developed a framework of five categories of the mathematics register: instrumental, procedural, conceptual, formal symbolic, and ‘making sense’ registers. Suggestions related to this framework are: (a) teachers may reflect on their mathematics register to analyze whether or not they promote meaningful learning of mathematics, and (b) the analysis
of students’ use of mathematics register may guide the research on student construction of mathematical knowledge.

Finally, I suggest that ESL teacher preparation programs include *mathematics methods* courses. Since ESL teachers are likely to provide mathematics instruction in several settings, they should also use strategies that promote construction of mathematics knowledge.

Recommendations from this study may then benefit: (a) ESL teacher education programs, (b) teacher pre-service and inservice preparation, and (c) research in mathematics education.