

METACOGNITIVE DISCOURSE IN MATHEMATICS CLASSROOMS

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Research in the area of mathematics emphasizes the importance of discourse as an integral part of doing mathematics (The National Council of Teachers of Mathematics, 2000). The discourse in mathematics classrooms includes at least two factors: mathematical discourse and metacognitive discourse. Mathematical discourse includes the abilities to construct mathematical conjectures, develop and evaluate mathematical arguments, and select and use various types of representations. Metacognitive discourse refers to using self-regulating behaviors.

The present study investigates the discourse in mathematics classrooms under two conditions: cooperative-learning with or without metacognitive instruction. The metacognitive instruction was based on the IMPROVE method (Mevarech & Kramarski, 1997). Under this condition, students were guided to activate metacognitive questions in small groups that focus on : (a) the nature of the problem/task (b) the construction of relationships between previous and new knowledge; (c) the use of strategies appropriate for solving the problem/task and understanding why; and (d) reflection on the solution process.

Participants were 122 eighth graders who studied in six heterogeneous classrooms. Data were video-taped and analyzed by using qualitative and quantitative methods. Discourse analyzes indicated different discourse characteristics under these two conditions. Students who were exposed to the metacognitive instruction within cooperative settings were better able than their counterparts in the COOP condition to express their mathematical idea.

Their mathematical discourse was more fluent and involved a richer battery of mathematical concepts. In addition, their discourse involved self-regulating behaviors (e.g., prove, check) than students who studied in cooperative settings with no metacognitive instruction. The practical implications of the study will be discussed on the conference.

REFERENCES

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