Talking mathematics: supporting children's voices

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Summary

Talking Mathematics: Supporting Children's Voices is a book, for pre-service and in-service teachers of grades K-5, that offers strategies to help teachers engage students in mathematical discourse. Teachers are encouraged to do mathematics as a learner, reflect on their own thinking, try some strategies, reflect on their teaching, and reflect on students' thinking. Additionally, the tool discusses purposes for the role of talk in developing mathematical thinking and learning. The selected readings in the book address many of the instructional challenges that teachers face around engaging students in mathematical discussions, offering strategies for exploration and encouraging reflection.

Purpose

Teachers need resources, both text and video images, that feature classrooms where talking and thinking mathematically is routine to help them develop strategies for fostering mathematical talk in their classroom.

Tool description

This book, for pre-service and in-service teachers of grades K-5, engages teachers into thinking about their own practice and helps them develop strategies for fostering mathematical talk in their classroom. The book is organized into four sections that provide insights into the role of mathematical talk, tasks, and the teacher's role in using mathematical talk to develop understanding. The book includes selected readings that help teachers think about ways to help students communicate mathematically and some of the challenges they may face. The complementary videotape, *Talking Mathematics: Supporting Classroom Discourse,* provides video images for what the strategies look and sound like when students are talking about their ways of thinking and reasoning.

Contents:

4. I, Thou, and It, David Hawkins
5. Tensions, John Mason
6. On Listening to What the Children Say, Vivian Gussin Paley
7. Improving the Quality of learning by Asking "Good" questions, Peter Sullivan
8. Curriculum Topics Through Problem Posing, Marion Walter

Section Four: Problems

Background

The strategies and ideas presented in this book are the result of collaborative efforts of researchers and teachers from different schools and grade levels who participated in the seminars of the *Talking Mathematics* project. The project staff worked with teachers who were exploring how to create cultures that support mathematical talk and inquiry. Teachers developed a learning community with their peers, solved interesting problems as "doers" of the mathematics, tried ideas in their classrooms, met regularly, and discussed their own practice in relation to what they were learning. Working on mathematics problems, not necessarily intended to be used in the teachers' classroom, proved to be an intellectual activity that teachers learned to appreciate and enjoy.

Design principles

The seminars served as a foundation for the book's development and were based on the following principles for teacher engagement. Teachers:

- doing mathematics together,
- reflecting on their own mathematical thinking,
- reflecting on teaching techniques, and
- reflecting on students' mathematical thought.

Using the tool

The book can be used for multiple purposes:

- **Individual teacher reflection:** The book helps a teacher understand the role of mathematical talk in the classroom. It provides suggestions, ideas, a few engaging problems, and selected readings to support a teacher's efforts to encourage mathematical talk in their classroom. A teacher can read the chapters, try out some ideas, and reflect on ways they can encourage and support mathematical discourse. An individual teacher can benefit from using this tool, but the teacher's learning would be greatly enhanced by sharing ideas with a colleague.
- **For professional development:** Selected readings from the book can be used in small study groups. A study group can be a comfortable environment and provide additional support for teachers. Teachers can work in grade level groups or across grade levels to discuss the important teaching and learning ideas over a period of time. The companion tool, *Talking Mathematics: Supporting Classroom Discourse,* provides video images for what the strategies look and sound like when students are talking about their ways of thinking and reasoning.

Evaluative evidence

Talking Mathematics was a 3-year project by 12 experienced elementary school teachers, working with TERC to investigate ways to develop mathematical discourse in their classrooms. Researchers summarize the project's findings in the paper "Talking Mathematics: 'Going Slow' and 'Letting Go'" Susan Jo Russell and Rebecca B. Corwin, Phi Delta Kappan (March 1993) Vol. 74(7): 555-558. Their findings include:

- teachers scheduled more time for mathematics,
- asked different kinds of questions and decreased a tendency of accepting the first right answer,
- required students to share their thinking, and students became better at doing so,
- structured mathematics experiences to focus on looking for patterns, making conjectures, generalizing, and developing rules and formulas.

Availability

Copies may be obtained through Heinemann's website http://www.heinemann.com

Strengths

- provides suggestions for supporting mathematical talk
- selected readings address important aspects of mathematical discourse
- includes interesting problems to engage teachers, as well as students, in "doing" mathematics
- provides classroom-based examples of mathematical talk through vignettes and stories
- includes a resource list organized by categories (e.g., Teaching and Learning)
- a companion video is available to show what the strategies look and sound like when students and other teachers are engaged in mathematical discourse

Likely challenges

- time to practice the strategies presented in the book
- suggested problems may not fit into existing curriculum—need additional sources for problems that promote mathematical talk
- teacher anxieties around "doing" mathematics
- establishing a study group with fellow teachers

Other comments

The Talking Mathematics Project is described in an article published by Hands On! http://www.terc.edu/handson/spring_95/talkmath.html,