

Classroom Discussions: Using Talk to Help Students Learn, Grades 1-6

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Summary

Classroom Discussions: Using Math Talk to Help Students Learn is a book that offers detailed and practical guidance to teachers who want to explore ways to engage students in productive mathematical talk. Mathematical talk contributes to deepening students' understanding because:

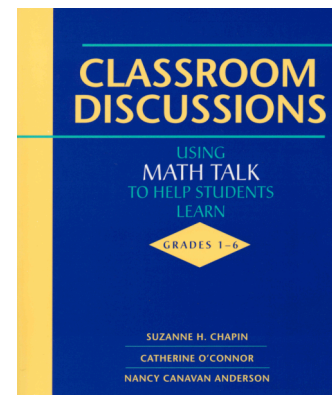
- Misconceptions get revealed, allowing teachers to address them;
- Group discussions improve students' ability to reason logically;
- Students learn to share their thinking and reasoning and listen to and learn from their peers; and
- Students are more motivated and take interest in what their peers are saying.

Purpose

This book was written to share strategies to help teachers learn to engage students in meaningful mathematical discussions. The guide provides specific strategies and ways teachers can use talk to deepen students' understandings and promote student learning.

Tool Description

This book provides detailed chapters that classroom teachers can use to enhance the learning of mathematics through use of mathematical discussions. The authors share a variety of tools, formats, strategies, ways to get started, troubleshooting ideas, and includes two extended case studies to help teachers develop and maintain a range of skills to facilitate students' discussions.



Background

This book grew out of a four-year research project funded by the U.S. Department of Education to help teachers become skillful facilitators of mathematical discussion in their classrooms. The authors collaborated on a program that was designed to enhance the learning opportunities for urban students and minorities and increase their representation in gifted and talented programs. The work grows out of an assumption that disadvantaged students, when given good curriculum and instruction, could be nurtured and developed to achieve at high levels.

Design principles

This book is organized in four sections that highlight different aspects of mathematical talk. The authors use vignettes to add clarity to ideas and strategies that are presented throughout the book. Chapter 2 presents five strategies or "moves" that are used

throughout the book to facilitate productive mathematical talk. Each move is described followed by illustrative classroom examples and an explanation of the teacher's actions. This chapter describes ways to group students and how to establish classroom norms that will promote equitable and respectful participation.

One of the major premises underlying productive mathematical talk involves careful planning and using good instructional materials. Chapter 10 helps teachers make thoughtful decisions about how to implement the strategies that have been described throughout the book. Five components of effective lesson planning are presented followed by a sample plan that integrates each component.

The materials

Contents

PART ONE: Talk in the Mathematics Classroom

An Overview

The Tools of Classroom Talk

PART TWO: The Mathematics: What Do We Talk About?

Mathematical Concepts

Computational Procedures

Solution Methods and Problem-Solving Strategies

Mathematical Reasoning

Mathematical Terminology, Symbols, and Definition

Forms of Representation

PART THREE: Implementing Talk in the Classroom

Getting Started

Planning Lessons

Trouble Shooting

PART FOUR: Case Studies

Looking at the Shape of the Data: Grade Three

Fair or Unfair: Grade Six

Evaluative evidence

The project researchers administered the Test of Mathematical Abilities—Second Edition (TOMA-2) and data from the mathematics subtest of the California Achievement Test (CAT) to collect evidence of students' mathematical abilities and achievement for those who remained in the project. When the project started, the first group of students had only 4% who were identified as superior or very superior in their mathematical abilities, 23% were above average, and the remaining 73% were average or below average. After two years in the project, 41% of the first group of students was rated as superior or very superior, 36% as above average, 23% were classified as average, and none were below average. Data from the CAT revealed that 70% of the first group of students scored better than the national sample. After working with the project for two years, they scored better than 91% of the national sample.

The researchers attribute a well-planned mathematics curriculum, projects, weekly quizzes, daily logic problems for warm-ups, and an emphasis on achievement for student growth and success. Additionally, the productive use of mathematical talk contributed to the improving students' thinking, reasoning, and their ability to communicate mathematically.

Availability

See Math Solutions Publications, <http://www.mathsolutions.com>

Strengths

- Offers several strategies and ways to get started to use productive mathematical talk as a means of gaining deeper insights into students' understandings.
- Identifies specific strategies and formats teachers can use to address a variety of situations that arise during discussions (e.g., revoicing, students' restating, grouping considerations)
- Provides short and two extended case studies to illustrate productive talk in action followed by an analysis of the teacher's actions and ways of facilitating students' thinking and reasoning
- Uses vignettes of teacher dialogues and discussions with students to add clarity to strategies
- Describes different purposes and uses of mathematical talk (e.g., developing conceptual understanding, computational procedures, solution strategies, reasoning)

Likely challenges

- Teachers need to allow adequate time to learn new skills and use the tools effectively
- Careful consideration needs to be given to a well-planned curriculum and lesson design