Visible Thinking In The K-8 Mathematics Classroom

Hull, Ted H.; Balka, Don S. and Miles, Ruth Harbin

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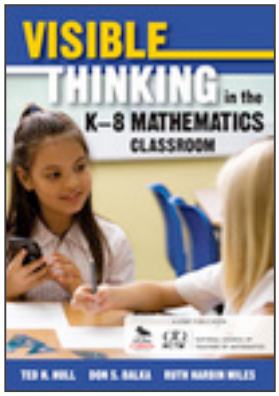
DESCRIPTION



Visible Thinking in the K–8 Mathematics Classroom, by Ted H. Hull, Don S. Balka, and Ruth Harbin Miles, argues that efforts to improve mathematics instruction must include teachers' actions along with the ensuing student responses. The authors believe that making thinking visible in mathematics classrooms and providing feedback is the key to improving instruction. Teachers use visible thinking to intervene with mathematical misunderstandings.

Effective visible thinking is evident in mathematics classrooms when:

- Teachers explain their thinking out loud.
- Students explain their thinking out loud.
- Students listen to others sharing their thinking.
- Students engage in discussions while forming their understanding.
- Students activate their inner dialogue as they read for understanding and study mathematics.
- Students record their thinking.

This book describes strategies for using visible thinking to increase student learning. The book is organized into four parts:

- Part 1 describes current research on thinking and learning.
- Part 2 describes specific suggestions for planning for the promotion of visible thinking.
- Part 3 describes how to implement the instructional model.
- Part 4 offers advice for leaders in ensuring that visible thinking is used in classrooms to promote success for every student.

STAGE 1 LEADERSHIP DEVELOPMENT

Visible Thinking In The K–8 Mathematics Classroom, by Ted H. Hull, Don S. Balka, and Ruth Harbin Miles, supports stage 1 development of leaders working to develop and model knowledge about instructional strategies for improved student learning.

Thinking is a requirement for learning mathematics that leads teachers to ask the following questions:

- What is mathematical thinking?
- Who needs to do the thinking?
- Can mathematical thinking be taught?
- Does all of mathematics require thinking?
- Is thinking about mathematics natural or manufactured?
- Is there one correct thinking process or are there multitudes of processes?

Specialists working to develop skills for making thinking visible to both students and teachers to develop understanding will find this book a useful resource. Reading and reflecting on the purposes and positive effects of visible thinking and the research-based teacher practices to make student thinking visible will provide valuable information for transforming practice. In addition, the benefits of visible thinking for students are explored, as seen below.

Figure 1.3 Visible Thinking: Purposes and Effects for Students

Visible thinking increases equity, the opportunity for every student to learn mathematics, by

- Increasing student interest, engagement, and motivation
- Promoting connections to previous learning
- Providing opportunities to think deeply
- Encouraging reasoning and sense making
- Opening dialogue and discourse within the classroom
- Promoting conceptual learning
- Increasing student feedback through ongoing formative assessment
- Supporting belief in effort over innate ability
- Broadening student understanding about learning mathematics
- Promoting student responsibility for learning
- Fostering a community of learners

STAGE 2 LEADERSHIP DEVELOPMENT

Visible Thinking In The K–8 Mathematics Classroom, by Ted H. Hull, Don S. Balka, and Ruth Harbin Miles, supports stage 2 development of leaders interested in the collaborative development and implementation of instructional strategies. This book might be used as a resource with teachers interested in developing instructional strategies to promote student understanding. Eight Visible Thinking Scenarios in Parts I and II show visible thinking examples in mathematics classrooms. These classroom scenarios also show how teachers might intervene to use the examples of visible thinking effectively, quickly, and appropriately. Each scenario is organized into the subheadings:

- Problem
- Mathematics within the problem
- What are students doing incorrectly?
- What are students thinking and saying incorrectly?
- Teacher intervention
- How did the teacher use visible thinking to intervene and correct a misunderstanding?

These subheadings provide a useful framework for colleagues working together to discuss the mathematics and how problems may be presented to students. Discussing the students' responses, what they do, think, and say, provides a model of anticipating student responses as an important part of planning and reflection. These same subheadings might be useful as teachers reflect on their own classroom experiences.

Part III provides examples of problems useful for implementing visible thinking in classrooms at the K-2, 3-5, and 6-8 level. Three types of problems - Brain-Teaser, Group-Worthy, and Transforming - are presented. Each problem is organized by:

- Problem
- Mathematics within the problem
- Setting the stage
- Exploring
- Summarizing
- Formative assessment of visible thinking
- Connections to strategies, actions, and conditions