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Mathematics discussions by design: creating opportunities for purposeful participation.

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Summary: The purpose of this study was to investigate the relationship between instructional design and classroom discourse as implemented by a mathematics teacher. The instructional design in this study distinguished three different types of discussions – framing, conceptual, and application – based on their sequential position, their purpose, the instructional task, and the associated assessment methods. Data included transcripts from nine videotaped class sessions from a US seventh-grade mathematics classroom during a unit on surface area and volume. The findings showed differences in the types of discourse interactions among the three types of discussions. By understanding the relationship between the instructional design and the discourse interactions associated with each discussion type, mathematics teachers may find opportunities to plan classroom discussions with higher quality interactions. In addition, teacher educators and mentor teachers can use the findings from this study to provide explicit assistance and feedback to prospective and newly inducted teachers who want to incorporate classroom discussion into their instructional units.

Classification: C70 D40

Keywords: classroom discourse; mathematical thinking; discussion-based teaching; formative assessment; instructional design; instructional decision-making

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