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Using challenging tasks for formative assessment on quadratic functions with senior secondary students.

Summary: Senior secondary mathematics students who develop conceptual understanding that moves them beyond “rules without reasons” to connections between related concepts are in a strong place to tackle the more difficult mathematics application problems. Current research is examining how the use of challenging tasks at different levels of schooling might help students develop conceptual knowledge and proficiencies in mathematics as promoted in the Australian curriculum – understanding, fluency, problem solving, and reasoning. Challenging tasks require students to devise solutions to more complex problems that they have not been previously shown how to solve, and for which they might develop their own solution methods.

Another key area of research is on formative assessment which has been found to be effective for increasing student motivation and achievement under certain conditions. This article describes one study within a larger project on challenging tasks. It explored 87 Year 10 students’ responses to a quadratics task, and their views on learning with challenging tasks and with multiple solution methods. Some ideas are shared on the potential for using challenging tasks, not only for conceptual learning, but also for formative assessment. This increases the benefit to students by not only providing opportunities for them to grapple with mathematics concepts relationally, but also giving them timely feedback that motivates them to address gaps between their knowledge and learning goals. It also provides teachers with valuable information on their students’ current levels of understanding to help them make adjustments in their teaching approaches during the learning process. (ERIC)

Classification: I20 D60
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