



Primary Students' Responses to a Cognitive Activation Lesson

Ciara Loughland
University of Sydney,
<char6275@uni.sydney.edu.au>

Janette Bobis
University of Sydney
<janette.bobis@sydney.edu.au>

Jennifer Way
University of Sydney
<jennifer.way@sydney.edu.au>

Cognitive activation, an instructional approach associated with increased mathematical achievement (Lipowsky et al., 2009), involves pedagogical practices that encourage students to engage in high-level thinking and develop a comprehensive understanding of content (Klieme et al., 2013). While cognitive activation is increasingly recognised as crucial for enhancing mathematical literacy, researchers have raised questions about its effectiveness across diverse student characteristics. Initial studies have revealed disparities in opportunities for participation in cognitive activation prompting further investigation into how educationally disadvantaged students perceive cognitive activation instruction.

The research presented in this paper focused on student responses to a lesson designed using cognitive activation principles. A Year 6 class participated in the lesson and ten individuals from the class were selected as case study participants. The case study students, representing a range of achievement and engagement levels determined through baseline testing, participated in semi-structured interviews following the lesson.

Cognitive activation principles, such as cognitively demanding tasks and collaborative learning, were frequently discussed during the interviews. Students responded positively to the cognitively demanding task when the challenge level was deemed suitable but responded negatively when the challenge level was too high or too low. Despite varying responses to the cognitively demanding task, students across all achievement levels recognised the value of challenge and struggle in their learning, emphasising the need for all students to engage in cognitive activation instruction. Positive responses were also observed for collaborative learning opportunities, although breakdowns in collaboration led to reduced task participation. Students also noted a link between increased cognitive and behavioural engagement with cognitively demanding tasks and identified task features that enhanced their motivation and time spent on tasks.

This initial exploration into student responses to a cognitive activation approach highlights its potential benefits for heterogeneous learners and provides insights into supporting students with diverse achievement and engagement characteristics to optimise their learning through this approach.

References

- Klieme, E., Pauli, C., & Reusser, K. (2009). The Pythagoras study: Investigating effects of teaching and learning in Swiss and German mathematics classrooms. In T. Janik & T. Seidel (Eds.), *The power of video studies in investigating teaching and learning in the classroom*. New York, NY: Waxmann Publishing Co.
- Lipowsky, K., Pauli, C., Drollinger-Vetter, B., Klieme, E., & Reusser, K. (2009). Quality of geometry instruction and its short-term impact on students' understanding of the Pythagorean Theorem. *Learning and Instruction, 19*(6), 527–537. <https://doi.org/10.1016/j.learninstruc.2008.11.001>