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Perceived Benefits of Collaborative Learning when Solving Cognitively Demanding Tasks

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Despite evidence linking problem solving and cognitively demanding tasks to higher student achievement, primary mathematics classrooms often rely on teacher-directed instruction (Le Donne et al., 2016). Although student perspectives on challenging tasks indicate they can both enjoy and learn from these experiences (Russo & Hopkins, 2019; Sullivan & Mornane, 2014), a degree of scepticism surrounding this instructional strategy remains, particularly for students of varying achievement and engagement levels. One suggestion in the literature is the integration of such tasks with other instructional practices, such as collaborative learning, to further enhance student engagement and participation (Russo & Hopkins, 2019).

This research was guided by the question: How do students with varying levels of mathematics achievement and engagement perceive the collaborative solving of cognitively demanding tasks? An exploratory case study was conducted with a heterogeneous Year 6 class from an independent school. Five lessons were designed, each featuring a cognitively demanding task to be solved collaboratively. Ten students with a range of achievement and engagement levels were selected to participate in semi-structured interviews after each lesson.

The analysis of student responses revealed six key insights regarding the perceived benefits of collaborative problem-solving, namely: increased peer learning opportunities, heightened efficiency, enhanced peer support, increased behavioural engagement, greater enjoyment and a deeper cognitive engagement.

Results from this study challenge the notion that complex tasks are unsuitable for low-achieving students and that they may disengage in collaborative settings. Instead, the study provides evidence that a collaborative setting can be beneficial for all learners in heterogeneous classrooms. The findings also suggest that a student's engagement level may have a greater influence on their perceptions of collaborative problem solving than their achievement level. In conclusion, the findings suggest that integrating cognitively demanding tasks with collaborative learning can create a supportive and inclusive environment that enhances students' enjoyment, peer support and engagement in mathematics.

References

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For more information, please refer to the following paper presented at the 47th Annual Conference of MERGA in July 2025.
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