Uncovering the Complexities of Mathematical Problem-Solving Instruction: An In-Depth Analysis of a Mathematical Problem-Solving Lesson for Low-Progress Primary School Students

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An important aspect of mathematics instruction in schools is its focus on presenting mathematics as sense-making and problem-solving rather than as a collection of facts, rules, and procedures (Schoenfeld, 1992). Despite the importance of developing mathematical problem-solving pedagogies and infusing them into lessons, many teachers struggle with the notion of teaching mathematics through problem-solving (Kaur et al., 2019). Given its nature, teachers often have to find a balance between scaffolding and challenging low-progress students such that their learning is maximised. Recognising the benefits of problem-solving, the key question that I will be focusing on in this study is: How might we then infuse mathematical problem-solving in classes so that low-progress school students can think creatively and independently while shifting away from a teacher-directed approach? A baseline study, which is part of a larger project, was conducted at a local primary school to examine the complexities of teaching problem-solving to low-progress students. A three-camera approach (Kaur et al., 2019) was used to capture the teacher's view, the students' view, and the whole class' view of the lesson. Data collected hence included video recordings, as well as a post-lesson interview with the teacher. I will examine the lesson in-depth and analyse the critical incidents observed during the lesson. An analysis of the critical incidents provides a detailed account of the significant incidents that take place in the lesson (Randall, 2002). Reflecting on these events is beneficial in enhancing teaching practices that strengthen students' mathematical thinking (Choy, 2014). In this presentation, I will share about these critical incidents observed while relating them to the theoretical underpinnings of mathematical problem-solving in extant literature. I will then invite feedback from participants and suggest how the lesson may be modified differently such that it can maximise the affordances of a mathematical problem-solving lesson for low-progress primary students. This study will support the development of a novel pedagogical model for teaching through problem-solving for low-progress students in future research.

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