



Changing Conditions to Enable Student Problem Posing

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Mathematical problem posing (MPP) offers opportunities for students to engage with mathematics beyond responding to teacher-generated questions. Despite increasing interest in MPP, implementing problem-posing tasks in classrooms remains challenging. This paper shifts attention from problem-posing tasks and student products to the conditions that shape what becomes possible when students are invited to pose their own problems. The research question that frames the paper is: *How are site-specific practice architectures reconfigured across cycles of implementation to further enable student mathematical problem posing?*

The study formed part of a Critical Participatory Action Research project conducted with three Year 6 teachers and their classes in an independent P-12 school in South-East Queensland. Drawing on the Theory of Practice Architectures (Kemmis & Grootenboer, 2008), two iterative cycles were analysed to examine how cultural-discursive, material-economic, and social-political arrangements enabled and constrained student problem posing.

In Cycle One, students collaboratively generated problems from a single visual prompt. Many students initially posed surface-level questions, such as counting words, colours, or people, and required teacher support to connect their questions to mathematical concepts. Students also reported difficulties negotiating which problems to pursue within their groups. These experiences informed the deliberate reconfiguration of conditions in Cycle Two. Students independently generated questions across eight visual prompts before collaboratively identifying mathematical questions and working in pairs to select and solve a problem.

The changes expanded the range of mathematical ideas and contexts students engaged with. Students connected glue bottles with making slime, lemons with fractions and juice yield, and building heights with geometric and proportional reasoning. Independent problem posing enabled broader participation, while smaller groups supported more efficient problem selection and progression into problem solving.

The findings suggest that changes in student problem posing cannot be attributed simply to students becoming more proficient problem posers. Rather, what students were able to pose changed as the conditions for prompts, task structure, and participation were reconfigured. The paper demonstrates how attending to the practice architectures can make visible the dynamic relationship between classroom conditions, teaching practices, and student problem posing. It offers insights for researchers and teachers seeking to create conditions that enable students to pose mathematically meaningful problems.

References

- Kemmis, S. & Grootenboer, P. (2008). Situating praxis in practice: Practice architectures and the cultural, social and material conditions for Practice. In S. Kemmis & T.J. Smith (Eds.), *Enabling praxis: Challenges for education*, (37–64). Sense Publisher.

For more information, please refer to the following paper presented at the 48th Annual Conference of MERGA in July 2026.
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