



Planning for Mathematical Problem-Posing: Exploring Practice Through the Lens of Practice Architectures

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In real life, problems are generated by the solver, Mathematical problem posing (MPP) reflects this reality, helping students to think deeply and make connections. It invites students to generate and solve their own questions, shifting the focus away from teacher-directed tasks and routine problems, towards curiosity and exploration. Although recognised in the Australian Curriculum: Mathematics and increasingly discussed in mathematics research (Cai et al., 2024) it remains rare in the classroom. As part of a larger doctoral action research study exploring teacher practices during the implementation of MPP, this paper uses the Theory of Practice Architectures (TPA) (Kemmis & Grootenboer, 2008) to explore how teachers plan for MPP, offering insight into what enables and constrains the practice of planning.

Three Year 6 teachers in Queensland participated in a planning session for free problem-posing (posing questions based on a prompt image or video). After selecting a lifeguard service sign image as a prompt, the teachers brainstormed possible questions, considered how ideas should be presented, and discussed strategies for helping students generate questions. The paper draws on transcript data to illustrate how cultural-discursive, material-economic and social political arrangements influenced planning in this setting, highlighting that practices do not happen in isolation, but are embedded in broader contexts. For example, the teachers drew on their technical and pedagogical language (cultural-discursive) to support the discussion, while also exposing moments of uncertainty. Shared prompts and access to technology (material-economic) supported quick decision making and collaborative planning but may have constrained creativity by limiting exploration beyond provided resources. Strong collegial ties and positive group dynamics (social-political) encouraged open dialogue and risk-taking.

Changing classroom practice is never easy. Finding the time, energy and confidence to try something new can feel daunting, however, this study shows that prior teaching experience, strong content and pedagogical knowledge, and supportive relationships all help sustain the process of planning when innovating practice. More generally, it is important to take stock of available resources, both physical and human, seek the opinions of others, and be open to change. In relation to MPP, find a prompt which your students will connect with, brainstorm mathematical connections, questions, and concepts, and most importantly, get started even if the path is not perfectly clear.

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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