Teaching Demands for Mathematical Explorations

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Mathematical Exploration is a problem situation that enables investigatory work by students, allowing for multiple starting points, multiple trajectories and approaches, and the flexibility to work at different levels of formalisation. Facilitating such explorations in the classroom places multiple demands on teachers. Literature acknowledges the need for teachers to have mathematical content knowledge, knowledge of students and teaching and the sensitivity to respond to contingent moments in the course of a planned activity (Ball et al., 2008; Rowland et al., 2005). The nature of these demands in an exploratory context differs from that in a curricular context. For example, being based in a game or a puzzle, not necessarily rooted in the curriculum, the nature of content knowledge that comes into play is different compared to that in a curricular context. Moreover, mathematical practices and the structure of mathematics take centre stage in an exploratory context. The flexibility promoted by explorations makes it more likely to encounter student ideas that are different from familiar mathematics. Listening, validating, and responding to students can be a challenging task. In my presentation I intend to look at the teaching demands in an exploratory context and illustrate them through an exemplar exploration.

References

Ball, D. L., Thames, M. H., & Phelps, G. (2008). Content knowledge for teaching: What makes it special? *Journal of Teacher Education, 59*(5), 389–407. https://doi.org/10.1177/0022487108324554

Rowland, T., Huckstep, P., & Thwaites, A. (2005). Elementary teachers' mathematics subject knowledge: The knowledge quartet and the case of Naomi. *Journal of Mathematics Teacher Education*, *8*(3), 255–281. https://doi.org/10.1007/s10857-005-0853-5

2022. N. Fitzallen, C. Murphy, V. Hatisaru, & N. Maher (Eds.), *Mathematical confluences and journeys* (Proceedings of the 44th Annual Conference of the Mathematics Education Research Group of Australasia, July 3–7), p. 602. Launceston: MERGA.