

Enhancing Mathematics Teachers' Pedagogical Content Knowledge in Communities of Practice

Osman Kasimu

University of Tasmania
osman.kasimu@utas.edu.au

Carol Murphy

University of Tasmania
carol.murphy@utas.edu.au

Vesife Hatisaru

Edith Cowan University
v.hatisaru@ecu.edu.au

Robyn Reaburn

University of Tasmania
robyn.reaburn@utas.edu.au

Communities of Practice (CoPs) are defined as groups of people who share a common interest, concern, or a passion about a topic, and who aim to deepen their knowledge and expertise in this area by interacting on an ongoing basis (Wenger et al., 2002). As such, they provide “a promising theme in the professional development of teachers” (p. 352) and a good framework for examining teachers’ learning (Patton & Parker, 2017). The application of CoP in educational research has suggested a positive impact for teacher professional learning (Goos, 2014). While there is much interest in the CoP approach to mathematics teacher professional learning (e.g., Jaworski, 2005), less is known about the impact of this approach on mathematics teachers’ pedagogical content knowledge (PCK) in a specific content area such as algebra word problems.

In this study, the first author established a CoP initiative where a group of eight junior high school mathematics teachers in Ghana met regularly during six months (once a month) to explore pedagogical strategies intended to support students in solving algebraic word problems. Whilst word problems are applied within most domains of mathematics in the Ghanaian mathematics teaching syllabus (e.g., fractions, integers), it is particularly in the algebra strand that most students find them challenging. A major difficulty is in “translating word problems into mathematical equations” (West African Examinations Council, p. 311).

Within the mentioned CoP, the teachers shared ideas and reflected on their use of various adopted strategies with their students. In this short presentation we provide some examples to illustrate the influence of the CoP on participating teachers’ PCK in relation to the use of visual representations such as bar models in solving algebra word problems.

References

- Goos, M. (2014). Communities of practice in mathematics teacher education. In S. Lerman (Ed.), *Encyclopedia of Mathematics Education* (pp. 82–84). Springer.
- Jaworski, B. (2005). Learning communities in mathematics: Creating an inquiry community between teachers and didacticians. *Research in Mathematics Education*, 7(1), 101–119. <http://doi.org/10.1080/14794800008520148>
- Patton, K., & Parker, M. (2017). Teacher education communities of practice: More than a culture of collaboration. *Teaching and Teacher Education*, 67, 351–360. <https://doi.org/10.1016/j.tate.2017.06.013>
- Wenger, E., McDermott, R. A., & Snyder, W. (2002). *Cultivating communities of practice: A guide to managing knowledge*. Harvard Business Press.
- West African Examinations Council. (2020). *Chief examiners' reports*. <http://www.waecgh.org/examiners-report>