

EXPLORING MATHEMATICS TEACHERS' EXPERIENCES IN A COMMUNITY OF PRACTICE

Osman Kasimu^a, Carol Murphy^a, Vesife Hatisaru^b, Robyn Reaburn^a

Contact Author: Osman Kasimu (Osman.kasimu@utas.edu.au)

^aSchool of Education, University of Tasmania, Launceston Tasmania 7250, Australia

^bSchool of Education, Edith Cowan University, Joondalup Western Australia 6027, Australia

THEME:

Teacher education and professional learning in STEM

BACKGROUND AND AIMS

Research studies have shown associations between teacher pedagogical content knowledge (PCK) and the effectiveness of teaching in individual STEM subjects including mathematics (Beswick, & Fraser, 2019). Studies aiming at professional development have shown that teacher collaboration is effective in enhancing PCK (e.g., Evens et al., 2015). The notion of teachers learning within Communities of Practice (CoP) has seen growing interest in educational research (Jaworski et al, 2017), but less is known about teachers' experiences in a CoP. This study aimed to explore Junior High school mathematics teachers' experiences in a CoP and the impact of these experiences on their professional learning.

METHODOLOGY

In this study, we draw on Wenger and colleagues' social learning theory and CoP framework to understand teachers' experiences in a collaborative environment. Eight junior high school mathematics teachers in Ghana participated in this study and met regularly during six months (once a month) to explore pedagogical strategies intended to support students in solving algebraic word problems. Thematic data analysis was used to analyse teachers' responses to semi-structured interviews on their experiences in the CoP.

RESULTS AND CONCLUSIONS

Results revealed that the group exhibited the three characteristics of a CoP (domain, community, and practice) as outlined by Wenger (2011). These characteristics showed a mutual relationship between the teachers, allowing them to share their experiences in teaching algebra word problems. The teachers gained new teaching strategies using visual representations which improved students' interest in mathematics. We conclude by offering recommendations to policymakers in education to look through the lens of CoP as a transformative approach to teachers' professional learning.

REFERENCES

- Beswick, K., & Fraser, S. (2019). Developing mathematics teachers' 21st century competence for teaching in STEM contexts. *ZDM*, 51(6), 955-965. <https://doi.org/10.1007/s11858-019-01084-2>.
- Evens, M., Elen, J., & Depaepe, F. (2015). Developing pedagogical content knowledge: Lessons learned from intervention studies. *Education Research International*, 2015, 1-23. <https://doi.org/10.1155/2015/790417>
- Jaworski, B., Chapman, O., Clark-Wilson, A., Cusi, A., Esteley, C., Goos, M., Isoda, M., Joubert, M., & Robutti, O. (2017). *Mathematics Teachers Working and Learning Through*
2022. J. Bobis & C. Preston (Eds.), Proceedings of the 7th International STEM in Education Conference (STEM 2022), University of Sydney, Sydney, Australia, November 23-26. University of Sydney.

Collaboration. Proceedings of the 13th International Congress on Mathematical Education, ICME-13 Monographs (pp. 261–276). Springer, Cham.

Wenger, E., Trayner, B., & De Laat, M. (2011). *Promoting and assessing value creation in communities and networks: A conceptual framework*. The Netherlands: Ruud de Moor Centrum.