

Editorial: Utilising Brookfield's Lenses of Critical Reflection

Noleine Fitzallen, Tracey Muir, Carol Murphy, and Robyn Reaburn
University of Tasmania

© Mathematics Education Research Group of Australasia, Inc.

Reflective practice has become a key element of many initial teacher education courses and ongoing professional learning for teachers (Hargreaves & Fullan, 2012). Citing Dewey (1933) and Schön (1983), Sellars (2013) defines reflective practice as the "deliberate, purposeful, metacognitive thinking and/or action in which educators engage in order to improve their professional practice" (p. 2). Importantly, reflective practice gives educators the opportunity to explore the reasons that lie behind what they do (Elliott-Johns, 2014). Schön (1983) suggests there are two aspects to reflective practice—reflecting in action and reflecting on action. Reflecting in action involves thinking critically about what is occurring in the moment; reflecting on action is thinking critically about events after they have occurred.

Taking a liberal view of reflective practice, the articles in this issue of *Mathematics Teacher Education and Development* can be described as examples of educators reflecting on action. Each of the articles report on research from the perspectives of the participants, whether they be teacher educators and/or pre-service teachers. In keeping with Schön's (1983) view that reflective practice involves critical examination of teaching and learning experiences, the research reported in this issue strives to derive new levels of understanding of teaching and learning that can be used to guide future action. Although not all the articles were written from a critical reflective perspective, the outcomes reported have the potential to be used by MTED readers to reflect on action in mathematics teacher education to inform; a key aim of the journal.

According to Brookfield (2017), the critical examination of practice can be viewed through four distinct lenses:

- Lens of personal experience
- Lens of students' eyes
- Lens of colleagues' perceptions
- Lens of theory

It is through the personal experience and colleagues' perceptions lenses that Butler, Prieto, Osborn, Howley, Lloyd, Kepert, and Roberts explored the interactions and learning essential for the success of multidisciplinary collaboration in initial teacher education. The study was designed to foster collaboration that united mathematics, science and education scholars across disciplinary boundaries. During the study the authors as participants were committed to developing practices to improve mathematics teacher education based on their individual and collective thoughts and actions. To do so, they reflected on their learning to determine what promoted or hindered the development of sustainable multidisciplinary relationships. The narrative-style used to present the results of the study maintains the personal nature of teaching and learning and adds richness to the story being told. Among other outcomes, the authors highlight the importance of being open with colleagues, which at times was found to be challenging. They conclude that the different ways of seeing shared by the participants enhanced instruction and promoted learning in ways that would not have happened otherwise.

Three articles in this issue of MTED referred to pre-service teachers as students and used the lens of students' eyes to explore the participants' perceptions of their teaching experiences: Preparedness

of Female Mathematics Preservice Teachers in Saudi Arabia (Alsaleh, Anthony, & Hunter), Pre-Service Mathematics Teachers' Self-Perceptions of Readiness to Teach Secondary School Mathematics (Hine & Thai), and Teachers' Experiences with and Perspectives on Grouping by Ability in Mathematics (Webel & Dwigins). The articles acknowledge the importance of determining pre-service teachers' prior learning and exploring factors that may impact on their self-efficacy and confidence. The articles report primarily on the perceptions of the participants from a reflection on action perspective.

Set within the context of mathematics teacher education in Saudi Arabia, Alsaleh, Anthony, and Hunter explored female Saudi pre-service teachers' feelings of preparedness to teach secondary mathematics. The study adopted a qualitative research approach using semi-structured interviews that took place in the fourth year of study of an undergraduate degree, after completion of the final practicum. It was found that the female pre-service teachers felt prepared to teach regarding teaching methods and strategies, but not prepared sufficiently in classroom management, lesson preparation, and integration of technology. Their descriptions of being prepared to teach mostly related to having appropriate teaching knowledge, especially content knowledge and pedagogical knowledge.

Hine and Thai explored pre-service teachers' preparedness to teach secondary mathematics in the Australian context. Their interview strategy targeted pre-service teachers' content knowledge, pedagogical content knowledge, and professional learning needs. Hine and Thai supplemented their data with pre- and post-practicum open-ended survey data. They found that the pre-service teachers were generally confident in teaching lower secondary school mathematics. The pre-service teachers identified the need for more professional development in both content and pedagogical content knowledge to teach higher secondary school mathematics.

In Webel and Dwigins' article, the lens of students' eyes and the lens of personal experiences are used to focus on pre-service teachers' perceptions of "within-class ability grouping" (WCAG) in elementary classrooms. The aim of the study was to better understand the extent to which pre-service teachers' ability grouping experiences can be leveraged for supporting critical interrogation of WCAG practices in elementary mathematics instruction. This study took place in the second year of an undergraduate teaching degree. The participants were asked to reflect on their experiences of ability grouping in their own mathematics education as well as on practicum. Many pre-service teachers (although not all) were negative about their own experiences of the use of WCAG when they were school students, even if they were put into the higher achieving groups. They did not, however, see the "potentially inequitable consequences in the grouping" in the classes they witnessed, even if they did not like the experience themselves. Webel and Dwigins suggested the possible reasons for this were due to the pre-service teachers' inexperience with alternatives and a tendency to express individual opinions in their reflections. The research undertaken provides an example of using cognitive conflict to challenge pre-service teachers' biases, assumptions, and preconceptions.

The fourth lens in the Brookfield (2017) framework is the lens of theory. Critical reflection through this lens utilises philosophy, research, and narrative descriptions of teaching and learning to "open up entirely new ways of thinking about familiar problems and dilemmas" (p. viii). A study conducted by Rouleau, Kontorovich, and Zazkis asked practicing teachers to reflect on the outcomes reported in research literature associated with the teaching and learning of mathematics. Rouleau and colleagues gave teachers four research articles from which to choose for examination. The teachers chose articles that either were relevant to their teaching or easily adapted to their previous mathematics knowledge. The findings of the study included that the teachers believed ideas and theories expressed in the articles helped improve their mathematical knowledge, instigated changes in their teaching of concepts targeted, and provided them with ideas for enacting the changes.

This issue of MTED concludes with a book review written by Glenda Anthony from Massey University. The book, *Numeracy across the curriculum: Research strategies for enhancing teaching and learning* (Goos, Geiger, Dole, Forgasz, & Bennison, 2019) also takes on Brookfield's (2017) view that research can inform classroom practice by looking through the lens of theory. The book was written by well-established mathematics education researchers and educators. It is a resource with practical, research-based strategies for pre-service teachers, practicing teachers, and teacher educators. The authors of the book emphasise that numeracy is a concern across the entire curriculum and provide

guidance on implementing the strategies into every day practice using real-life contexts; applying mathematical knowledge; promoting positive dispositions; and using physical, representational, and digital tools through a critical orientation.

References

- Brookfield, S. D. (2017). *Becoming a critical reflective teacher* (2nd ed.). San Francisco, CA: Jossey Bass.
- Elliott-Johns, S. E. (2014). Working towards meaningful reflection in teacher education as professional learning. *Learning Landscapes*, 8(1), 105-122.
- Goos, M., Geiger, V., Dole, S., Forgasz, H., & Bennison, A. (2019) *Numeracy across the curriculum: Research strategies for enhancing teaching and learning*. Crows Nest, Australia: Allen & Unwin.
- Hargreaves, A., & Fullan, M. (2012). *Professional capital: Transforming teaching in every school*. New York, NY: Teachers College Press.
- Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. New York, NY: Basic Books.
- Sellars, M. (2013). *Reflective practice for teachers*. London, UK: SAGE Publications.