
Editorial

Engagement and Impact: A Focus on Mathematics Teacher Educators' Studies into Practice

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Researching the teacher educator as practitioner is an emerging field and an area that is ripe for further exploration (Anthony, Cooke & Muir, 2016). This Special Issue of *Mathematics Teacher Education and Development* contains seven articles written by experienced Mathematics Teacher Educators (MTEs) who have conducted inquiry into their practice, and evaluated the impact of this practice on their pre-service teachers (PSTs). These authors draw from national and international backgrounds, including Australia, New Zealand, USA and Canada. As such, this Special Issue makes a valuable and timely contribution to the field of MTE research, particularly as evidence-based teacher education is a current political priority (Anthony, et al., 2016).

The focus of this Special Issue reflects the Australian Government's interest in examining how universities are translating their research into economic, social and other benefits, beyond the contribution to academic research. In our call for submissions of articles for this Special Issue, we highlighted an interest in articles and research that focused on MTE practices that demonstrated engagement of, and impact on, PSTs. Specifically, we asked MTEs to share research conducted into their practice as a means to address an identified issue, and to evaluate the impact of their teaching approaches or initiatives. Following a rigorous review process, seven papers were accepted for this Special Issue, and all share a common theme of collaboration and reflection on practice.

We see practitioner inquiry as a way of investigating a situation where the findings can be shared so that it becomes more than reflection or personal inquiry (Menter, Elliott, Hulme, Lewin, & Lowden, 2011). Inquiry is usually conducted within the practitioner's own context, often occurs in collaboration with others, and creates a space for examining existing ways of working, offering practitioners a "better understanding of their practice and ways to improve it" (McLaughlin, Black-Hawkin, & McIntyre, 2004, p.7). As illustrated in the articles in this Special Issue, practitioner inquiry often involves reflection and self-study. Like Loughran (2007), we see reflection as a personal process, whereby self-study takes that process and makes it public. At the heart of both reflection and self-study is a problem, dilemma, tension, issue or concern that causes one to stop and pay careful attention to a given situation (Loughran, 2007). Each of the papers in this Special Issue incorporates practitioner inquiry related to the study of MTEs' work and practice, and are summarised next.

Collaborative inquiry was a feature of many of the studies included in this Special Issue. Anthony, Averill and Drake collaborated to support prospective teachers through the introduction of pedagogies of rehearsals. In their engagement with practice-based teacher education, the authors explored and analysed the affordances and constraints associated with their personal learning as MTEs. The impact was substantive on multiple levels of teacher-educator knowledge, particularly the new possibilities of being more inclusive and responsive to the diversity of their PSTs. Implications from this paper warrant further exploration of practice-based teacher education, and the value of a collaborative community of practice to support reflective practice.

Gibbons and colleagues reported on the facilitation practices in mathematics teacher education and the identities of elementary PSTs. This research team was interested in supporting a cohort of American PSTs in their development as mathematical learners and chose to consider what facilitation practices might provide PSTs with opportunities to develop their mathematical identities. As part of a self-study, and to identify the facilitator's practices, 20 classes of video recordings were coded and analysed. To understand the PSTs' perceptions of their experiences, survey data were also collected. In summary, there were four key mathematics teacher educator facilitation practices that appeared to support PSTs to develop productive mathematical identities: emphasising reasoning, promoting broader engagement, shifting responsibility for learning, and developing a supportive classroom community.

Ingram, Linsell, and Offen drew on longitudinal data from their New Zealand study, and a Growing Mathematics Teachers' Project, to report on primary PSTs' relationships with mathematics over time. The results focused on the development of PSTs' mathematical content knowledge as well as aspects of affective learning. During the study, the researchers adjusted the program to support PSTs' development of their mathematical content knowledge and affective aspects including beliefs, feelings and associated identities. Similar to Gibbons and colleagues, this study also highlighted how PSTs' mathematical identity grew and developed over time. This was evident in the way the PSTs' relationship with mathematics changed due to the impact of the intervention, and their realisation that they needed to build their own content knowledge.

Sellings and Brandenburg used the term 'data praxis' to describe the practice of developing a custom-designed suite of data gathering tools and approaches to inform their mathematics teaching, and enhance the mathematical learning of their PSTs. This approach required them to interact with data in an ongoing way and to use a combination of evidence to refine and reshape their practice as MTEs. Their inquiry focused on identifying the prior knowledge, attitudes and confidence of their PSTs, with a focus on building on these aspects, to develop PSTs' conceptual and pedagogical understandings of mathematics teaching.

Similarly, Bragg and Lang reported a self-study as a collaboration that describes the (re)design of a mathematics education assessment task for primary PSTs over four years within a peer learning team. Barnett and Coate's (2005) dynamic framework of curriculum based on three interacting dimensions "knowing, acting, being" was employed extensively to evaluate the effectiveness of the assessment task, as well as being a feature of the assessment task itself. This honest account of a process of self-study and collaborative review of processes of teaching, learning, and assessment offers valuable insights when contemplating changes in curriculum work and improved learning outcomes for PSTs and teacher educators.

While there are accounts in the literature which involve collaboration between mathematics education researchers and in-service teachers (e.g., Geiger, Muir, & Lamb, 2016; Geiger & Goos, 2006), these studies were usually situated within schools and classrooms. Downton, Muir and Livy provided an account of a co-teaching situation whereby a MTE worked alongside a primary school teacher to teach a cohort of primary PSTs. This initiative was enacted to enable the PSTs to make stronger connections with the teaching profession. The authors chose

two tutorial vignettes to describe how the co-teaching situation facilitated the making of connections between theory and practice. An inter-connected model which incorporated six aspects of practice proved useful in interpreting the results of the study.

Nolan's self-study research explored the re-conceptualisation of her role as a university advisor while disrupting traditional discourses on theory-practice transitions through the development of a Teacher-Intern-Faculty Advisor (TIFA) Internship Learning Community. Nolan conceptualised new Bourdieuan fields of social practice in teacher practicum experience, confirming the third space of an internship learning community. The third field, supported by collaboration and dialogue, situated within the theory-practice nexus of mathematics teacher education. Nolan purports the TIFA learning community strength lies in the diverse noticing perspectives offered from PSTs, experienced in-service teachers and a teacher educator.

These seven papers provide an international perspective on MTE study of their practice in mathematics teacher education. Collectively these papers help us to consider ways to foster individual and collective mathematical agency within PST education (Gibbons et al., 2018). We hope you enjoy reading about the dilemmas identified by our authors and the ways in which they engaged in practitioner inquiry to address challenges that would be relevant to other MTEs.

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