

Special Issue
Mathematics Education in Malta

Editorial

Michael A. Buhagiar
michael.buhagiar@um.edu.mt

Marie Therese Farrugia
marie.t.farrugia@um.edu.mt

Leonard Bezzina
leonard.bezzina@um.edu.mt

Broadly speaking, mathematics education aims “to study the factors affecting the teaching and learning of mathematics and to develop programmes to improve the teaching of mathematics” (Godino, Batanero, & Font, 2007, p. 127). As a relatively recent scientific discipline, mathematics education lacks a consolidated and dominant research paradigm. As a result, as Sriraman and English (2010) note, there have been frequent shifts in the dominant paradigm. They point out the progressive shifts from behaviourism, through to stage and level theories, to various forms of constructivism, to situated and distributed cognitions, and more recently, to complexity theories and neuroscience. Sriraman and English explain that for the first couple of decades of its life, mathematics education as a discipline drew heavily on theories and methodologies from psychology. However, by the end of the 1980s, as researchers began to focus on the social dimension of learning, theories that view mathematics as a social product began to be used, and thus, socio-cultural theories became more dominant. Sriraman and English argue that one plausible explanation for these shifts is the diverging epistemological perspectives about what constitutes mathematical knowledge; another possible explanation proposed by Sriraman and English is that mathematics education is heavily influenced by unpredictable cultural and political forces.

This drawing on a variety of theoretical approaches contributes to the progress and the richness of the discipline (Godino et al., 2007). In our view, the collection of five research papers and a commentary presented in this special issue of *Malta Review of Educational Research* (MRER) gives testimony of this diversity. For sure, the reader gets some indication of the varied research interests and research methodologies that are currently being explored in the field of mathematics education in Malta. However, although this issue aims primarily to generate ideas and discussions among readers with special interest in mathematics education, we are very much aware that MRER has a much wider audience, both locally and internationally. In view of this, we decided to favour topics that have the potential for the widest possible educational appeal. As will become clearer once we refer briefly to each of the six contributions, the non-mathematics education reader has the opportunity to come across a number of diverse issues that, albeit embedded within a myriad of mathematics education environments, can still resonate with his or her research interests.

The first two papers adopt a qualitative case study approach to focus on the professional journeys undertaken by teachers. Calleja investigates the learning journeys of secondary school teachers of mathematics as they engaged in a one-year long continuing professional development programme. He reports on teachers' community of practice experiences as they participated in a purposely-designed programme that aims to support teachers in learning to teach mathematics through inquiry. Calleja explored the teachers' motivations for joining this professional development programme and their learning experiences through in-depth interviews and a focus group. A key discussion in Calleja's paper focuses on the teachers' views about programme effectiveness. Their ongoing interactions generated in-depth practice-based understandings that call for a rethinking in the way professional development is offered to teachers in Malta. On the other hand, Buhagiar uses the notion of change to frame his analysis of one teacher's professional journey over the years from a traditional to an inquiry-based approach. Adopting a narrative research approach, Buhagiar shows that while teacher change can happen, it may be neither linear nor enduring. Furthermore, it appears to be facilitated by certain factors, including a teacher's motivation, available opportunities, and the presence of a professional learning community. In particular, Buhagiar highlights the inspirational role of a school-based educator who is willing and able to support professional learning among colleagues.

The third paper of this special issue also focuses on the role of the teacher. However, in this case, the teacher is the author himself. Borg reflects on his own experience teaching a group of six low-performing secondary school students. Borg uses radical constructivism as a guiding theory, developing a framework which he refers to as 'Mathematics-Negotiation-Learner' (M-N-L).

This framework takes into consideration the mathematics a teacher intends to teach, the classroom interaction with students, and the learners' own constructions of mathematics. In his paper, Borg shows how this framework enabled him to analyse his own teaching strategies. In Farrugia's paper, the focus now shifts to classroom interaction between a primary school class teacher and her pupils. Assuming a Vygotskian perspective, Farrugia considers the teacher to be a more knowledgeable adult, scaffolding her pupils' learning of topic related mathematical words. Farrugia's main focus of attention is the use of both Maltese and English in the interaction; she notes the apparently beneficial use of translanguaging that includes the translation of the topic-related Maltese words with which the pupils were already familiar. The final paper by Zerafa shifts the focus on the learners, in particular learners with mathematics learning difficulties. Zerafa's paper stands out from the other papers in that the author uses statistical methods to standardise mathematics tests – previously standardised in the UK – for Malta. Norms were found by administering the tests to a sample population of 10 year-old boys. The norms were then used to examine the test scores obtained by a cohort of pupils in the school where Zerafa taught. The aim of this procedure was to identify six pupils with mathematics learning difficulties with whom an intervention was to be carried out. Hence, this paper describes the process of sample selection.

This special issue ends with a personal commentary by Mamo who, apart from dedicating his professional life to the teaching of mathematics, also served for a number of years as mathematics Head of Department within the state secondary school sector. Reflecting on his headship experiences, Mamo explains his key contributions to mathematics education in Malta, and shares his perceived successes and disappointments. He also highlights what he considers to be three important elements that have guided the manner in which he had sought to carry out his role of Head of Department, namely, the love of the subject, collegiality, and professional integrity.

This special issue of MRER presents a collaborative effort, which to the best of our knowledge is the first of its kind in Malta, among individuals who are actively involved in mathematics education. A unifying factor among all the six authors is that they have all done, albeit over different periods of time, and following different types of courses, their initial teacher education at the University of Malta. As one would expect, all six individuals have experienced different career pathways after joining the profession. Notwithstanding this, all of them have sought to keep abreast with research related to the teaching and learning of mathematics. Indeed, this group of people have a passion for mathematics, enjoy teaching mathematics and learning more about how it can be taught more effectively, and have always sought to share their knowledge and expertise with pre-service and inservice teachers of mathematics. In recognition of this, all six authors are among the

regular contributors to the mathematics education programmes organised by the Faculty of Education, at the University of Malta. Over the years, Faculty has offered these programmes at both undergraduate and master's levels. More recently, moreover, mathematics education has joined the ever growing list of subject area specialisations being researched at doctoral level within our Faculty.

On a final note, we would like to dedicate this special issue of MRER to all those who have contributed in the past, in some way or another, to the advancement of mathematics education in Malta. One can locate these individuals among those who have worked in schools, who have developed education policies, who have offered support to teachers and schools, and who have guided teachers' formation and learning throughout the various stages of their professional lives. Malta owes a lot to these people, as they are the ones who have laid the solid foundations on which we continue to build today. The contributions in this special issue give testimony, in fact, to the varied and lively field that mathematics education is becoming as of late in Malta. All of this would probably not have been possible had we not benefited from the foresight, dedication and commitment of those who entered and worked the field before us. Some of them are certainly rather well-known, while others are practically invisible to the general public. Still, for us, they are all worthy of our deepest and sincerest gratitude.

References:

- Godino, J.D., Batanero, C., & Font, V. (2007) The onto-semiotic approach to research in mathematics education, *ZDM Mathematics Education*, 39(1/2), 127-135.
- Sriraman, B., & English, L. (2010) Surveying theories and philosophies of mathematics education. In B. Sriraman & L. English (eds.), *Theories of Mathematics Education: Seeking New Frontiers* (pp. 7-32). Berlin: Springer-Verlag.