



Editorial

How can STEM be enhanced by geography?

Terri Bourke, Editor, *Geographical Education*

Susan Caldis, Guest Editor

Welcome to the 2021 edition of *Geographical Education*. This edition is one outcome of the Australian Geography Teachers Association's (AGTA) work around actioning a recommendation from *Shaping Australia's Future: A strategic plan for the discipline of geography*. This recommendation centred on recognising geography as a partial STEM subject, and hence the title for this year's journal is *How can STEM be enhanced by geography?* Susan Caldis as STEM Ambassador for Science and Technology Australia co-hosted national symposia with Dr Grant Kleeman to initiate dialogue with leaders from the discipline about the geography and STEM recommendation. As a result, Susan was invited to be Guest Editor for this edition of the journal.

I would like to thank Susan for accepting this invitation, updating the geography community on where this work is at, and providing the network of authors who kindly accepted to contribute to this publication.

This volume contains four papers from a variety of people engaged in STEM-related activities in geography. The first paper by Caldis and Kleeman outlines the background to the STEM project in geography and reports the findings from the symposia held over the last year. These findings include conceptualising geography as the *science of place*, recognising the connection and contribution that geospatial technologies could offer STEM, and various mechanisms to make geography in the STEM field more visible (for example, this edition of the journal). Caldis and Kleeman offer several recommendations for action in this space in terms of learning, teaching and research as well as other visibility mechanisms such as the appointment of a Chief Geographer. This paper also details the presentations at the symposia – and the next two papers in this edition are published outputs from those presentations.

GeoSTEM: “*The Urban Mess*” *Interdisciplinary Learning in a Project-based Learning High School Environment* by Parnis and Hendry, teachers at Parramatta Marist High School. The article showcases a geography STEM integrated

initiative at the western suburbs school in Sydney. This project focuses on issues of urbanisation, sustainability and design within a local context, in line with the New South Wales syllabus Stage 5 Changing Places. Specifically, students explored data, statistics and processes associated with population projections and considered engineering and technological advancements that allowed sustainable urban designs for the future. This initiative is an example of real-world problem-solving which engaged students and showed the complementary nature of geography and STEM.

The third paper is written by Dr Kate Selway; Superstar of STEM, Senior Lecturer and Australian Research Council Future Research Fellow at Macquarie University. Selway, coming from an earth scientist perspective, advocates for geography to be part of STEM for three reasons: (1) it would help students pursue and achieve their own goals; (2) it would help interested students find fulfilling careers in areas of national skills shortages; and (3) it would help develop a population and future leaders who will make successful and well-informed decisions. In relation to the first reason, Selway is particularly interested in how mathematics and such geographical skills, such as geographic information systems (GIS) and online mapping tools, can be integrated to solve problems. She maintains that, in a world where big data is prevalent, having these STEM/geographical skills would be fruitful. In the second reason, Selway points out the unique skills geographers have which, when combined with STEM skills, could rectify shortages in our workforce in such fields as environmental monitoring, mineral exploration, and geospatial science. And lastly, how individuals with STEM/geography backgrounds can not only be active global citizens but become the decision-makers for the future.

The last paper was an invitation extended to Professor Graciela Metternicht – Chair of the National Committee for Geographical Sciences. This paper by Teece et al. showcases a project (Copernicus for Sustainable Agriculture in

Australia or COALA) that promotes the adoption of satellite earth observation products and services for sustainable agriculture in Australia. In this project researchers, curriculum developers and teachers co-designed activities tailored to specific educational outcomes of the New South Wales syllabus. This is an example where the newest technologies from the European Space Agency aided the development of problem-based learning activities for the classroom. In this paper, the authors encouraged getting new scientific research into high school curricula for the benefit of all stakeholders.

Many thanks to both the writers of the papers and the book reviews. Many thanks also to Geoffrey Paterson as proof-reader and Reviews Editor of the current volume. The book review titles reflect a range of topics in geography that teachers and researchers alike should find useful and interesting. AGTA looks forward to contributions to the next edition of the journal Volume 35, 2022. Details will be forthcoming.

A note from Susan Caldis, Guest Editor

Geographical Education is the peer-reviewed journal of the Australian Geography Teachers Association. Over the years, each editorial team enables important international and national debates in geographical education to be showcased by a range of scholars.

Since 2018, Associate Professor Terri Bourke and Associate Professor Rod Lane have worked tirelessly to bring rigour, relevance and diversity to the forefront of each edition. Themed sets of papers which span empirical, theoretical and personally reflective domains are carefully curated to promote dialogue and challenge readers to consider their thinking and practice in and

about geography education. In 2018, the focus was on assessment; in 2019 on innovation as *Geographical Education* celebrated its 50th year. In 2020, the cross-curriculum priorities of the Australian Curriculum were given prominence in a geography education context while in 2021 the spotlight is given to geography and STEM.

This year, it has been a pleasure to take on a Guest Editor role and work alongside Terri. I am immensely grateful for the opportunity to learn, and to continue the journey of a recommendation for geography education in *Geography: Shaping Australia's Future*. To see symposia presentations take on a new form as a publication offers further reach and opportunity for dialogue about the future of geography education.

In signing off my Note from the Guest Editor, I would like to do so in my recently acquired role as AGTA Chair. On behalf of the AGTA Board, I would like to extend our sincere appreciation and gratitude to Terri and Rod for their years of service to the journal. In 2018, Terri and Rod commenced their term as co-editors of *Geographical Education*. In 2020 Rod departed Australia and academia to pursue new career opportunities in New Zealand. Terri continued to lead the journal during 2021, however, this edition does conclude the "Terri and Rod era". Terri and Rod embraced the co-editor role as a team. With their combined vision, scholarship, and professionalism, they have greatly enhanced the quality, relevance, and visibility of *Geographical Education*. Thank you for your leadership of the journal, your collegial approach, and for your sustained interest in the work of AGTA. As a Board, we wish each of you every success in your future endeavours and look forward to new opportunities for our paths to cross.