

DIVERSITY IN NUMBERS – CULTIVATING A GROWTH-MINDSET FOR NUMERACY DEVELOPMENT

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Developing a solid foundation in quantitative skills (QS, e.g., numeracy, statistics) is essential for students' academic success. More broadly, numeracy is a core language for understanding and developing critical thinking around current and future challenges in sustainability, artificial intelligence and climate change. However, Australian tertiary QS teaching is often limited to one 100-level unit and between 1-3 units later in the degree (Matthews et al., 2012). This provides little opportunity for vertical scaffolding of QS or even STEM students' recognition of QS as an essential element of their learning, as QS development is not prioritised in their courses.

The ACDS-funded Diversity in Numbers (DiN) project evaluates an alternative curricular model for numeracy skills development within the science curriculum: scaffolded, course-wide implementation of digital numeracy modules with embedded interactive content and rich automated feedback to maximise learning. Pilot modules have been developed, each focusing on a core QS concept (e.g., statistical testing, unit conversions). Modules are framed around a published article relevant to unit content, with the goal of broadening student awareness of how numbers can be used to explore global diversity. By promoting a culture of inclusivity and diversity, where students can see themselves within the curriculum, we aim to foster a sense of belonging among our diverse undergraduate students, supporting the emergence of an increasingly diverse scientific community.

Preliminary qualitative findings from student focus groups during semester two 2022 will be presented, considering the implications of DiN modules on student engagement and learning, numeracy anxiety and awareness of diversity.

A major finding of this work was that most students in the focus group displayed a fixed mindset to QS, although we did see some variability depending on the context in which students received their school-level mathematics education. While most students could recognise a fixed mindset around maths, leading to anxiety or avoidance of QS, students educated outside the Australian education system were not constrained by this. From these findings, it seems that fostering a growth mindset around QS development is a crucial first step in engaging Australian students with university-level numeracy concepts. We propose that participating in scaffolded QS modules that sit outside the graded curriculum and offer formative feedback may support students to develop a growth mindset towards QS.

REFERENCE

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