

REIMAGINING MATHS PEDAGOGY IN NQ

Sophie Raynor^a, Shaun Belward^a, Madalyn Casey^b, Kiana Payne^a, Zoe Pettifer^c, Grace Jefferson^d

Presenting Author: Shaun Belward (shaun.belward@jcu.edu.au)

^aPhysical Sciences, College of Science and Engineering, James Cook University, Townsville QLD 4810, Australia

^bPathways, Academy, James Cook University, Townsville QLD 4810, Australia

^cEducation Design, Quality, and Standards, Education Division, James Cook University, Townsville QLD 4810, Australia

^dEducation, College of Arts, Society & Education, James Cook University, Townsville QLD 4810, Australia

KEYWORDS: Regional, Anti-deficit pedagogy, UDL, Strength-based, Maths Education

SUBTHEME: Equity, Diversity and Inclusion

The higher education sector is responding to intense challenges. The effects on mathematics subjects are amplified due to a consistent decline in mathematics proficiency in schools and in the broader population. The Australian Mathematical Sciences Institute reports 20% of the Australian adult population demonstrate a numeracy level insufficient to meet work and life demands (Marchant & Kennedy, 2024, p. 53); a concern amplified by emerging employment opportunities that demand advanced quantitative skills (p. 46). Here, we describe an intervention at James Cook University (JCU) in North Queensland, that responds to these challenges.

JCU has significant proportions of regional and remote students whose average mathematical literacy is reported below that of metropolitan students by an equivalent of 1.5 – 4 years of schooling (Marchant & Kennedy, 2024, p. 16). Additionally, the decline in participation in senior school mathematics in the JCU catchment is much greater than the national average (QCAA, 2020-2024). At JCU, students are failing preparatory mathematics subjects at a greater rate than university averages, and the success rates of students from disadvantaged backgrounds are disproportionately poorer.

This project seeks to improve outcomes for all JCU students, enabling proficiency equal to the broader population. We draw together institutional knowledge from the perspectives of academic and ancillary staff to explore supporting transition pedagogy with Anti-deficit Pedagogy (Peck, 2021), and Universal Design for Learning (Nieminen & Pesonen, 2020). At this stage we are yet to collect any data however our research in 2025 will allow us to synthesise the experience from stakeholders with pedagogical strategies to inform small interventions for implementation in 2026 and broader interventions resulting in updated program structures in 2027.

ACKNOWLEDGEMENTS

This work is supported by the Higher Education Participation and Partnerships Program (HEPPP).

REFERENCES

- Marchant, T. & Kennedy, S. (2024). *The state of mathematical sciences 2024*. Australian Mathematical Sciences Institute. <https://amsi.org.au/?publications=the-state-of-mathematical-sciences-2024-8th-discipline-profile-of-mathematics-and-statistics-in-australia>
- Nieminen, J. H., & Pesonen, H. V. (2020). Taking universal design back to its roots: Perspectives on accessibility and identity in undergraduate mathematics. *Education Sciences*, 10(1), 12. <https://doi.org/10.3390/educsci10010012>
- Peck, F. (2020). Towards anti-deficit education in undergraduate mathematics education: How deficit perspectives work to structure inequality and what can be done about it. *PRIMUS*, 31(9), 940-961. <https://doi.org/10.1080/10511970.2020.1781721>
- Queensland Curriculum & Assessment Authority. (2020-2024). *Senior subject enrolment by school* [Data set]. <https://www.qcaa.qld.edu.au/news-data/statistics/statistics-from-2020>