

# FACING THE CHALLENGES OF UNDERGRADUATE MATHEMATICS EDUCATION: FINDINGS FROM THE FYIMATHS PROJECT

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## BACKGROUND AND AIMS

Mathematics departments experience many challenges in teaching increasingly large cohorts of first-year students, who have more diverse academic backgrounds and lower levels of mathematical preparation than ever before. The situation is further complicated by the fact that many students are not particularly motivated to study mathematics, but are required to do so as part of their business, science, education, health sciences or engineering degrees. Institutions have responded by introducing a range of measures including establishment of teaching-focused academic roles, developing new approaches to teaching and in expanding mathematics support resources and services. However significant challenges still remain.

In recognition of the complexity and size of first-year mathematics programs, a number of institutions have appointed academics to First Year Coordinator roles. These academics have a wide range of duties which can include the management and training of sessional staff, quality assurance of teaching, curriculum review, oversight of assessment and results, running first-year transition programs and providing course and career advice to students.

An Office for Learning and Teaching funded project, *Building leadership capacity in university first year learning and teaching in the mathematical sciences*, known as *First Year in Maths (FYiMaths)* investigated all aspects of the role of First Year Coordinator and the challenges of teaching undergraduate mathematics. This project aimed to develop leadership capacity through provision of workshops, mentoring, sharing of resources and the creation of an improvement-orientated network.

## METHODOLOGY

The project involved qualitative data collection, organising workshops and seminars, developing a website and collecting resources. The data obtained from 40 interviews at 26 universities in Australia and New Zealand, provided an in depth insight into the roles of First Year Coordinators in mathematics, the challenges they face and how they are addressing these challenges.

The approach taken to developing the network and organising the workshops focused on identifying common interests, providing opportunities for developing personal contacts, information sharing and facilitating collaborations and mentoring relationships. The workshops served as a focal point for building the network's sense of identity and purpose.

## FINDINGS

The project identified a clear need for an undergraduate mathematics network to provide not only support to individual First Year Coordinators and teaching academics, but as a means of facilitating a broader approach to solving sector wide challenges. The project activities immediately struck a chord with the undergraduate mathematics community by providing an opportunity for many to voice long held concerns, establish connections with peers in other institutions and disciplines and to participate in a community of practice. The data collection provided a rich source of information about how mathematics departments manage first-year teaching, assessment, student support, development of coordination roles, curriculum design, teaching innovation and professional development. In addition,

the project demonstrates the potential for discipline networks to provide academics with a voice in the current policy debates on STEM education.

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