

First Year in Maths

Building leadership capacity in
university first year learning and
teaching in the mathematical sciences

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Why is this
important?

First year students are our future

- Graduate students
- Professionals with maths qualifications
- Scientists
- Economists
- Teachers
- Decision makers

First Year in Maths Project

This is a project about people rather than things

The aim of the project is to:

- Develop a position description/attributes
- Raise the profile of FYC's work
- Articulate the value of designated positions
- Describe first year culture

- Create a vibrant and supportive network

An Office of Learning and Teaching funded project (2012-2014)

With many thanks!

What's in a name?

- Few designated first year directors
- Individual subject coordinators rather than a single person with oversight of multiple subjects
- Wide range of responsibilities, similar duties to a director but on a smaller scale



Activities

How did we go about it?

- **In-depth interviews**
 - 39 academics who teach first year mathematics at 25 universities in Australia and New Zealand.
- **Two workshops (Melbourne, June 2013 & 2014)**
 - provided a space for people to meet and exchange ideas and identify key concerns and challenges.
 - Workshop 1 focused on identifying key issues
 - Workshop 2 focused on modes of teaching
- **A national forum (Sydney, Feb 2014)**
 - attended by 145 academics, educators and representatives from all STEM disciplines.
 - focused on the impact of assumed knowledge entry requirements on STEM disciplines.

Network building



Key findings: Responsibilities

- **Leadership**
 - Input into departmental, faculty and university decision making
 - Strategies and vision for mathematics program
- **Management**
 - selection and allocation of staff
 - tutor training
 - monitoring and feedback (QA)
- **Administration**
 - Enrolment, student progress, complaints, reporting requirements, databases, timetables
- **Teaching and Assessment**
 - Curriculum update and reform
 - Exam papers/results



Key findings: Diversity

Meeting the needs of diverse student cohorts in terms of support, curriculum design, administration and teaching.

- Students

- Preparation/background
- Ability
- Needs/interests
- Engagement
- Career aspirations

- Service teaching

- Maths staff don't know context
- Service discipline colleagues don't know content



Key findings: Adaptive responses

Developing adaptive responses to student diversity by creating new teaching, assessment and support mechanisms and services.

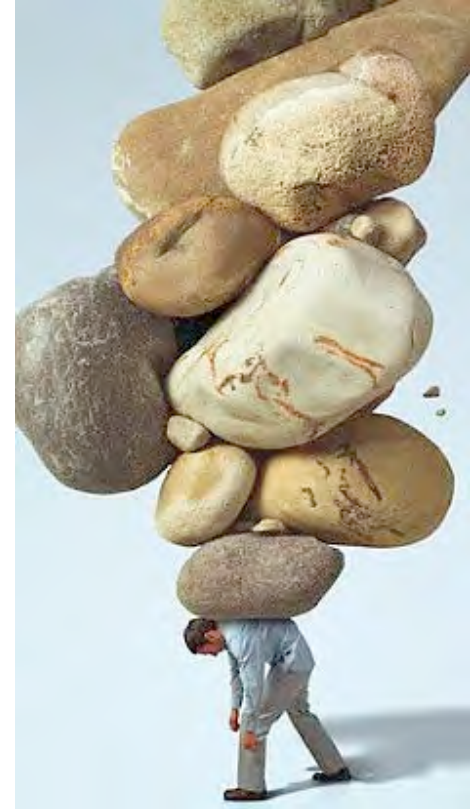
- Extension for advanced students
- Multitude of service courses
- Diagnostic testing
- Bridging subjects
- Maths support
- Online resources
- New teaching methods



.....but *“when colleagues are trying to protect their research space it’s hard to shift the status quo in teaching”*

Key findings: Challenges

- High workload
 - Constant interruptions
 - Lack of support
 - No validation from colleagues
 - Lack of contact with peers
- Effecting change
 - Lack of positional authority
- Balancing research, training, admin and life
 - $40+40+20+X > 100$
 - Learning on the job – no professional development



Feeling under pressure and under-valued!

A poison chalice?

The role of a first year university mathematics director/coordinator is extremely varied:

- subject coordination
- curriculum design
- student administration
- student services
- staff management

It is often a role with:

- no position description
- no positional authority
- significant decision making
- responsibilities
- enormous challenges

Roles are often detrimental to careers



A contradiction

- We want good people in these roles
- **We hijack their careers**
- We ask them to take on managerial roles
- **We give them no professional development**
- We want them to improve curriculum, retention and engagement
- **We give them no authority**
- We want them to improve teaching and be innovative
- **We give them no training or time to do it**



Building a network

The project has successfully initiated a network that has:

- **Advocated** for individuals by becoming a stakeholder in the debate over mathematics and science education
- **Raised awareness** about the challenges in teaching first year mathematics
- **Developed** a website providing resources, information and a contact point for isolated staff www.fyimaths.org.au
- **Organised events** for professional development
- **Facilitated collaboration** between individuals
- **Built supportive relationships** between previously isolated individuals

What is leadership?

- Positional authority means the ability to make changes
 - *"I do think there has to be a champion and that's what I think these roles do provide."*
- Taking the lead when innovation is required
 - *"being the guy in teaching and learning I have to show leadership and show whether it [the innovation] can be done in maths."*
- Showing leadership
 - *".....I don't feel I've really done that yet, and he said oh yes you have, ... you're very visible, you're running these teaching and learning seminars, you're leading with the (assessment) innovation..."*

Are we there
yet?

Can the network develop leadership in coordinators of first year mathematics?

- The success of our project so far suggests that support for, and recognition of, leadership roles needs to come from outside an organisation, as well as from within
- Building a community of practice around shared concerns in mathematics provides valuable context and evidence for effecting change
- People need personal contact and face to face meetings in order to share challenges and devise strategies and solutions



Project Team

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