First Year in Maths

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

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First year students are our future

- Graduate students
- Professionals with maths qualifications
- Scientists
- Economists
- Teachers
- Decision makers
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
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.
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!**
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](http://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…”
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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