

Green Table

Compare first-year subjects across your institutions

- Separate calculus and linear algebra subjects. Some all tied up together
- Linear algebra: common content -> vectors, not vector spaces, etc...
- Calc: no longer epsilon delta stuff
- Organisational constraints (teaching Engineers so limited in no. of maths subjects they can take)
- Stats: some have compulsory stats, some optional
- Calc: common content pretty standard up to DE's.
- Melb Model: course geared towards what mathematicians want?
- Not many unis teaching calculus and linear algebra as the one course. But when taught together, the two topics don't really talk to each other.

Blue Table

Where do your first year courses sit in various programs at your institutions?

- Most have service and maths subjects together in first year. Need a common curriculum.
- Same course that can be streamed for different disciplines.
- Some places can do maths in different degrees (B. Arts, B. Science, etc.)
- Drivers for first year program guided by size of university.
- Flexibility: what entry level students are entering university with.
- Providing choice when students arrive.
- Common driver for all: needs of service faculties.
- Collaboration with other disciplines: demands come from the service faculties. Limited team teaching going on between faculties (e.g., UQ). Fed U: feedback comes in on how students fare from service courses after a specific subject is taken.
- Collaboration: chairs from two schools will first talk to each other. Once plan is agreed, then staff that do the teaching will go ahead and plan. Committee structure rather than individual decision.
- More similarities than differences between universities. What caused differences was size and service subjects.

Red Table

What are the articulation arrangements from school to first-year university maths?

- Baby, Intermediate, and Specialist maths.
- UQ: Intro, Intermediate and Advanced option
- Not that different across universities
- La Trobe: has more options available at first year. Some need Intermediate, everything else needs no prerequisites.
- Fed U: no prerequisites. Everyone is lumped together.
- 2:5:10 ratio at UQ
- Monash: 1:2:1
- Success for bridging units at Fed Uni.
- UQ: students that do bridging course often do not do well when doing Intermediate Calculus course.
- Basic maths: tends to be business, environment students (UQ).
- Monash: basic maths filled with many students who have not done maths, and many international students who have to “prove” maths competency. Large disparity.
- UQ: looking to weed out high ability international students from bridging subjects. Possibly testing students before the subject starts.
- ANU: third year students taking bridging course for an easy grade.
- Issues from multiple universities that students are taking subjects they should be taking.
- Anti-requisites aren't quite stopping the problem

Orange Table

What are the articulation arrangements from first-year mathematics to higher levels of maths study?

- Some unis mix calculus and linear algebra. The other half have them as separate subjects.
- $\frac{1}{4}$ of first year maths load has to be maths in order to progress to 2nd year maths. But typically students do 3/8. However, UQ they do a half load for B. mathematics.
- Monash: not allowed to do only maths subjects. Melb Uni: can't do 4. 3 is the max.
- Specialised streams for subject areas: e.g., maths for biomed, computer science, engineering. Engineering common.
- Some unis – maths does the service teaching at first year then other faculties take over at higher year levels.
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Green and Blue Table

Are level 1 mathematics subjects fit-for-purpose?

- No (Green)
- Yes (Blue)
- Purpose: are fit for purpose but have to be careful how we teach them. Pedagogical issues. Change student focus. Content is fit for purpose but change focus for different disciplines.
- Subjects are streamed for different disciplines. Same content, but tutorials might have different topic focused questions.
- Bridging: not fit for purpose. Trying to fit a whole year's curriculum into 12 weeks. Aim – reduce maths phobia. In this way it is fit for purpose.
- Organisation constraint UQ: can't have subjects specific for disciplines.
- Pass/fail rates. Does high failure rate mean not fit for purpose?
- What's the relationship between accreditation and fit for purpose?
- Organisational constraints to be order to make our subjects fit for purpose. For example, high failure rate, want to extend length of subject but can't fit into degree.

Orange and Red Table

What else, beyond mathematics content should be taught/included in a level 1 mathematics subject?

- Presentation standards. Student writing and oral presentations. Should students produce videos instead of oral presentations?
- Peer review
- Improve mathematical communication
- Use of software (CAS), programming skills
- Improve problem solving skills.
- Unable to apply skills to unfamiliar contexts
- WRITE AN ESSAY!!
- Thinking skills.
- What does stuff actually mean?
- Backlash from mathematicians for “thinking” subjects
- Non-maths things aren’t taught. Depends on the educator.
- Collaborative learning.
- Lack of indigenous knowledge.
- Lack of history and philosophy of maths
- More whiteboard tutorials wanted!
- Need mathematical literacy
- Teaching learning how to learn (metacognition, self-regulatory skills)