Review and Reflection – Engaging first year mathematics students as self-reflective learners

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Assessing a foundation mathematics unit

- Portfolio based assessment
- Some sections of portfolio presented for checking of completion only
- Some sections marked – defacto assignments
- Exam – with student compiled summary sheet allowed
- **In class review tasks**

Review task

- Essentially an in class test covering 3 to 4 weeks of work
- 3 review tasks in one semester – last one a practice exam
- Students were told about task in advance
- Students were asked to do task under exam like conditions
- Could ask tutor for clarification
- Consult notes for formulas

Reflection

- Last page of review task a reflective proforma
- Used a likert like scale to rate students' self confidence with mathematical techniques being tested
- Two open ended questions – what was easiest and why? What was most difficult and why?

Now that you have completed these questions please indicate how comfortable you feel about completing each of these mathematical skills on the scales below.

	I need significant help Have to refer to text I don't understand this					Can do most of these Mainly make silly mistakes A few bits are unclear	Comfortable doing all of these types of questions
Simplifying fractions	○	○	○	○	○	○	✓
Converting to a mixed number	○	○	○	○	○	○	✓
Converting to a fraction	○	○	○	○	○	○	✓
Adding and subtracting fractions	○	○	○	○	○	○	✓
Multiplying fractions	○	○	○	○	○	○	✓
Dividing fractions	○	○	○	○	○	○	✓
Finding a percentage of a number	○	○	○	○	○	○	✓
Converting a fraction to a Percentage	○	○	○	○	○	○	✓
Using ratios	○	○	○	○	○	✓	○
Converting a number to scientific notation	○	○	○	○	○	○	✓

Likert scale considerations

- Odd number of choices / even number
- Number of choices (5, 7 or 9?)
- Implicitly numbered or no real scale
- Implicit labels or a variety of scales
- Language use – formal vs. informal

Student honesty

Now that you have completed these questions please indicate how comfortable you feel about completing each of these mathematical skills on the scales below.

me in a nutshell

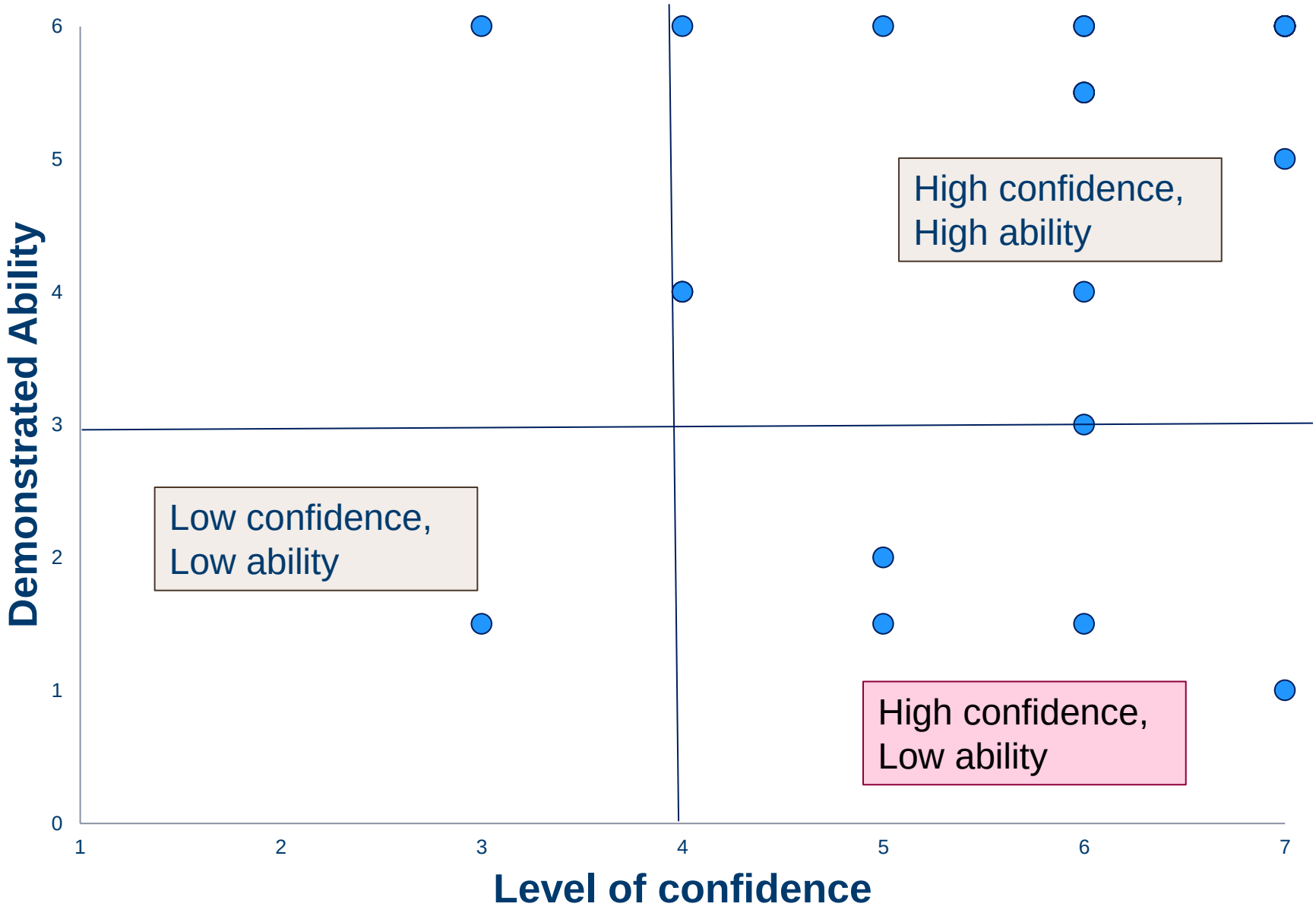
	I need significant help Have to refer to text I don't understand this			Can do most of these Mainly make silly mistakes A few bits are unclear			Comfortable doing all of these types of questions
Simplifying fractions	○	○	○	○	○	★	✗
Converting to a mixed number	○	○	○	○	○	○	✗
Converting to a fraction	○	○	○	○	○	○	✗
Adding and subtracting fractions	○	○	○	○	○	○	✗
Multiplying fractions	○	○	○	○	○	○	✗
Dividing fractions	○	○	○	○	○	✗	○
Finding a percentage of a number	○	○	○	○	○	○	✗

only because I'm forgetful

Usefulness of reflections

For teaching staff

- Quick summary of class level of understanding
- A cross check of students' self ratings and achievements can pinpoint issues to be followed up (i.e: students who feel they can do questions in a topic but have a fundamental misunderstanding of the required technique)


Demonstrated Ability
Level of confidence
0
1
2
3
4
5
6
1
2
3
4
5
6
7
High confidence,
High ability
Low confidence,
Low ability
High confidence,
Low ability

Usefulness of reflections

For students

- Exposure to the mathematical framework / language / concepts behind the techniques
- Self assessment of both skills and confidence – allows targeted follow up by student
- Exposure to the concept of reflective learning early in their course

Comments that challenge

Which areas do you have the most difficulty with and why?

I have no idea how logs work since I never used them. I also didn't ~~[illegible]~~ retain any knowledge from further mathematics in years 11 and 12.

Why were students having difficulty?

- Hadn't paid enough attention in previous maths studies
- Concept difficult to grasp / visualise (e.g. unit conversions)
- Not good at showing clear working – setting out
- Not remembering rules / formulas
- Hadn't seen it before (Significant figures)

What could they do and why?

- They were confident with Geometry and Pythagoras
- Lots of previous practice
- Spatial / visual mathematics

Questions?

Which areas do you have the most difficulty with and why?

I have no idea how logs work since I never used them. I also didn't ~~[illegible]~~ retain any knowledge from further mathematics in years 11 and 12.