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Enhancing Feedback Delivery to Large Classes

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The Problem: scale

- Level 2 Mathematics
  - over 400 students
  - 8 modules
  - each week 80 tutorial groups meeting
- Level 1 Mathematics
  - over 700 students
  - 4 modules
  - each week 50 tutorial groups meeting

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The Problem: not enough feedback to students

- Plenty of formative assessment, but limited feedback
- Level 2 feedback
  - 1 class test
    - 3-4 questions
- Level 1 feedback
  - 4 workshops
    - 2 questions
  - 1 class test
    - 8 questions

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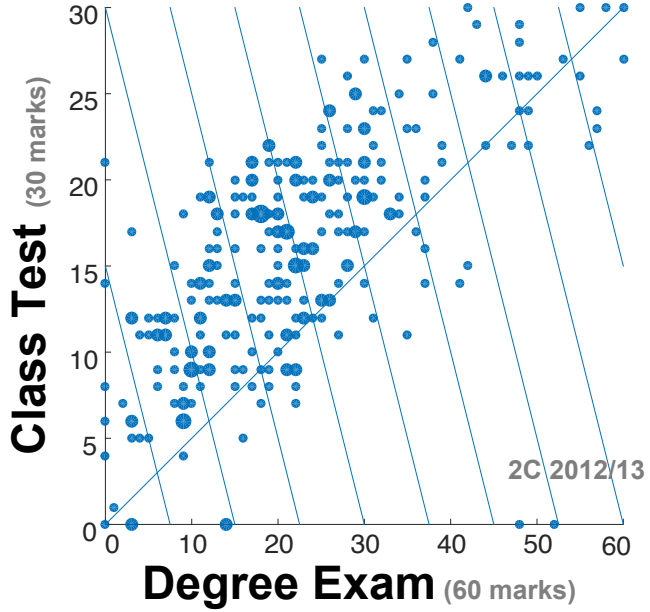
The Problem: no positive effect from class test



- Class tests returned near end of semester
- Poor attendance during class test weeks
- Class test disrupted learning; students disengaged with course

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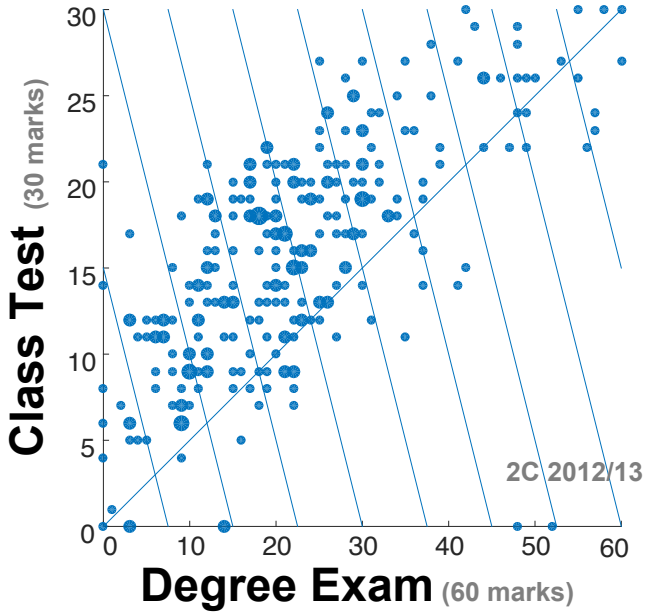
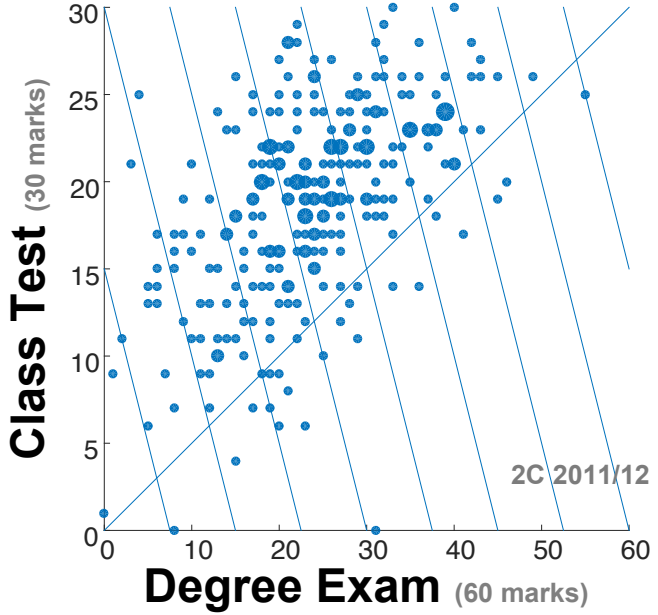
The Problem: no positive effect from class test





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The Solution: increasing feedback, not workload

- Over 2,000 individually assessed pieces of work per week
- Integration of technology
  - e-assessment software: WebAssign
  - scanning technology: written assignments
- Efficiencies: team work
  - School Office – IT staff – Academic staff –
- Recognition:
  - University Teaching Excellence – Herald Innovation Technology Excellence

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The Solution: efficient teamwork

	Course Head	Lecturers	Tutors	Markers (2B and 2F)	Office	IT	Students
Monday	Check whether any announcements are needed for the week. (2B) Post solutions for sheet $n-1$ and new exercise sheet n at 12pm.		Attend tutorials, (2ABFP).	Submit marked feedback exercises (2B or 2F) by 4pm.	After marking is returned, notify IT that scripts are ready for scanning. Pass information on total number of submissions and marking allocation to IT.	Upload 2A, 2B WebAssign results to Sharepoint.	Attend tutorials. WebAssign 2A (deadline 3am).
Tuesday	Upon notification by IT, make visible the access to feedback on Moodle, forum announcement for students.	Deliver lectures (2A and 2F).			Photocopy relevant feedback exercise sheet for distribution to 2B or 2F lecturers.	Scanning. Upload `.pdf` feedback to Moodle, upload completed grading worksheet to Moodle, upload marks to Sharepoint. Notify completion, send raw data (with marker initials) to course head.	Attend lectures.
Wednesday	Post feedback exercise at 12pm (one week before deadline). Reveal solutions to the submitted feedback exercise at 3pm (sharp).	Deliver lectures (2B 2P). Distribute feedback exercise forms (2B), spares t submission cabinet.			Collect feedback exercises (3pm deadline). Allocate marking, notify markers for collection.		Attend lectures. Submit feedback exercise (2B or 2F).

Office

After marking is returned, notify IT that scripts are ready for scanning. Pass information on total number of submissions and marking allocation to IT.

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The Solution: live SharePoint database

studentID	name	fb1	fb2	fb3	fb4	wa1	wa2	wa3	wa4	wa5	wa6	wa7	wa8	wa9	wa10	degree mark (out of 60)	Comments
Count= 431																	
[redacted]		19	20	12			100	96.5	98.831	75.625	80	85.9895	59.5	79.64	60.125	37	
[redacted]		17	11	15		81.5	76.5	86.5	61.4135	84.75			90	66.18	43.62	34	
[redacted]	*** Unenrolled	20					76.9										
[redacted]				6	7	71.25	56	56.5		26.888	50			33		30	
[redacted]		18	19	20	20	89.5	70.5	79	94.1655	93	100	91.143	79.5	96.5	97.2105	50	
[redacted]		17	15	17	14	81.831	90	100	93.0035	30	94.75		93	95.919	68.001	44	
[redacted]		13			8	63.8615	78.3345	46	58.161	38.032	64.375	65.419	69.5	69.04	36.1625		Medical
[redacted]		12	11			78.0845		69	73.169			21.8245	63		34.775	21	
[redacted]		16		12		68.25	89.5	86.5	60.669	50	100	75.41				31	
[redacted]		20	11	15		77.75	94.75	96.5	81.8345	93	96.5	47.312	72.5	56.2335	39.7	42	Medical
[redacted]		15		13	16	78	63.4	56	78.2445	38.506	89.125	67.621	72.5	69.82	54.863	46	Medical
[redacted]		18	12	17	6	83	80.75	73	79.7475	71.494	86.5	86.68	63	67.216		28	
[redacted]		11	19	17	13	93	84.1345	76	78.7455	86	83	87.051	86.5	94.826	46.193	42	
[redacted]		9	10	15			86	49.5	81.581		96.5	80.18	79	89.279	17.95	39	

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The Results: what our students say

The constant online assessments kept me focused and led me to study regularly

I like the way we are constantly assessed as it helps me to keep on top of my learning and study

constant assessment meant I was kept on top of my studies

was brilliant, made me work and look into things more

makes me sit down and ensure I understand the week's work

motivates you to actually go home and do work for the course

The online work was compulsory, this was good as it actually made me do it, unlike some other subjects where it is optional

why can't we have WebAssign on every subject we do at university?

Weekly assignments forced us to revise - makes exam easier

Keeps you on the balls of your feet,

the regular webassign homeworks are a good way of forcing you to absorb the last weeks learning with the reward of credits and grades!

loved the multi assessment aspect, meant i was continuously revising

It was really well structured, loads of feedback throughout on the work you'd done

regular homework feedback

Everything is online, it's engaging

it's very easy to get on anywhere and quick

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The Results: what our students say

getting % for doing your homework every week to give you a bit of a buffer for the exam — I think I speak for everyone when I say we all have a love/hate relationship with webassign

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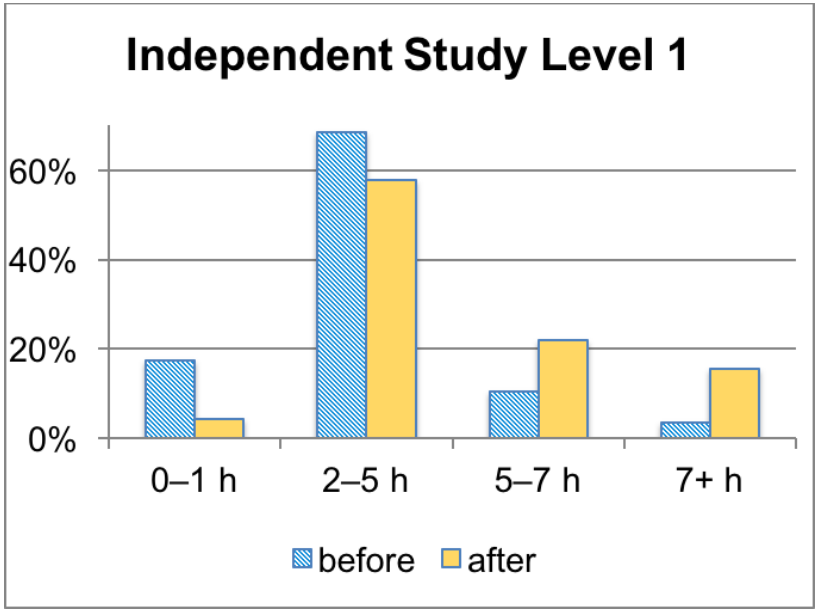
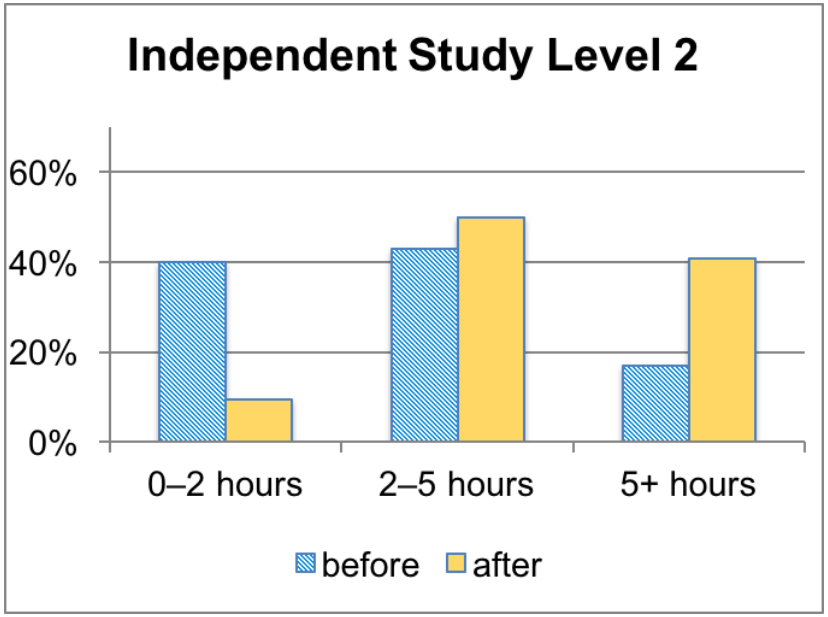
The Results: time-on-task





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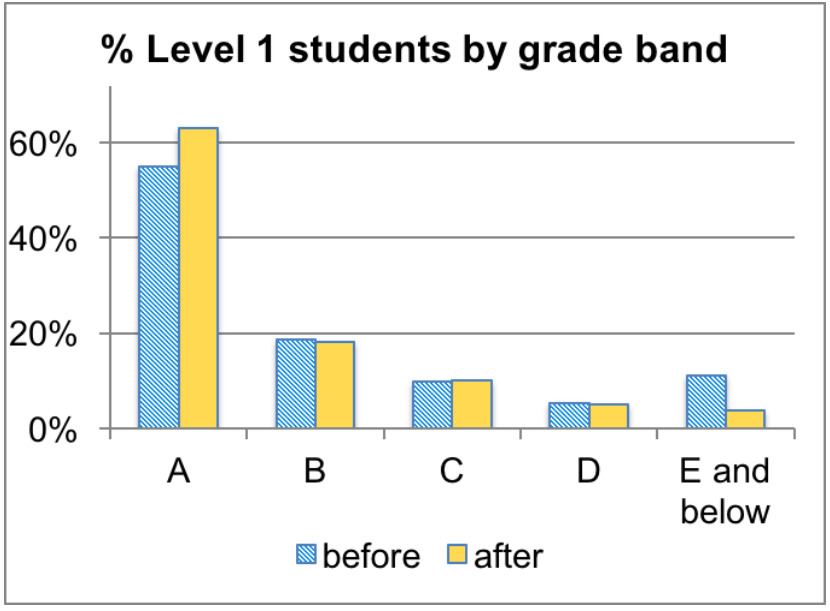
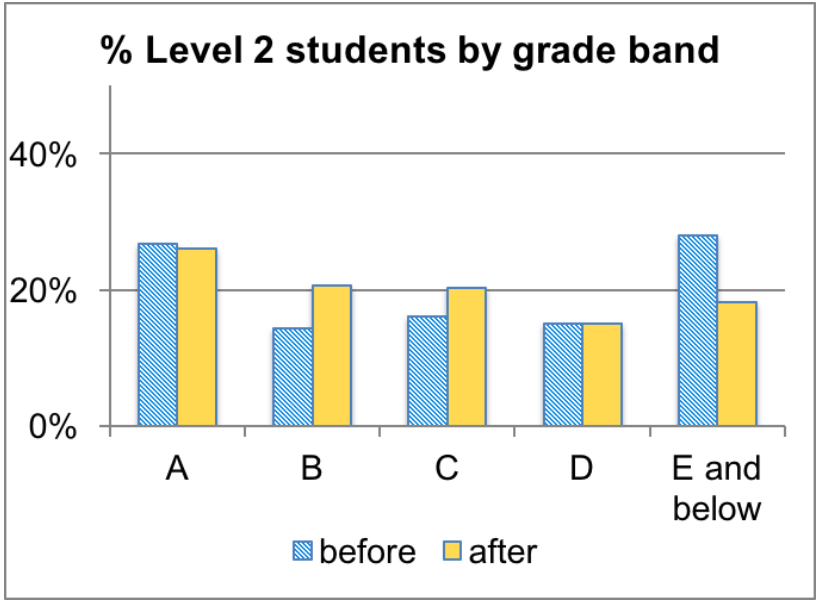
The Results: student grades





Refinements: ‘just-in-time’ teaching philosophy

Image: CC The Center for Teaching — Vanderbilt University

‘provide[s] a good way to understand the parts of the course that need more care when delivered to students, and to better shape tutorials.’

Level 1 Lecturer & Tutor

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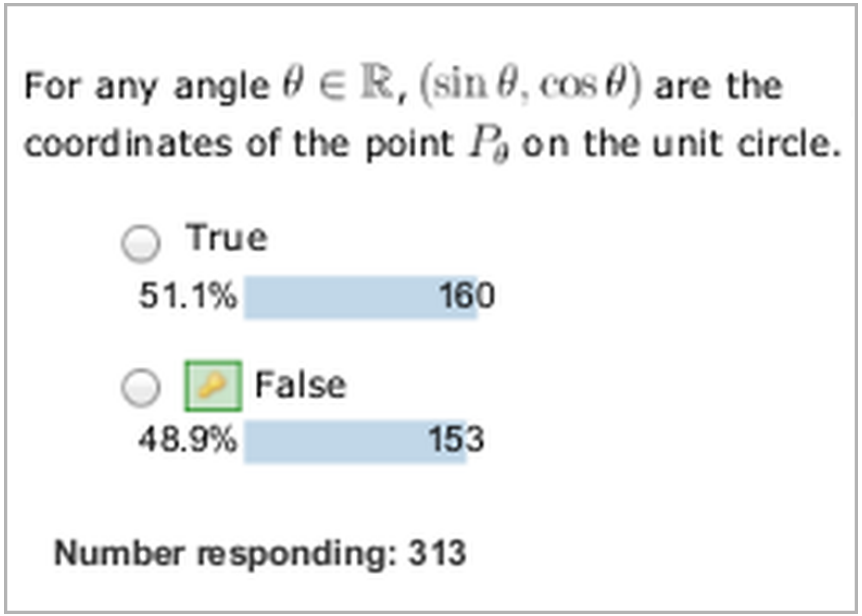
Refinements: ‘just-in-time’ teaching philosophy

Monday

- short online T/F quiz completed
- questions designed to
  - foster conceptual change
  - highlight concepts students may be struggling with
  - encourage student-student & student-faculty interactions



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Refinements: ‘just-in-time’ teaching philosophy

Feedback

- Q18 (false) *For any real angle θ, (sinθ, cosθ) are the coordinates of the point P_θ on the unit circle.*

  Owch! The responses to this question were split 50-50. Firstly recall that these questions are based on the lecture notes, so you needed to read through these to find the definition of P_θ as the point with argument θ and modulus *1*. Secondly, this is very close to the definition of the sine and cosine functions for all angles. To show that this statement is false it is enough to draw a quick sketch of a right angled triangle with hypotenuse *1* and other side lengths determined by the 'coordinates' given in the question – you will quickly see that this statement cannot be true in general.

Tuesday

- Provide Feedback to Students, Tutors & Lecturers
  - results & analysis (see left) shared via Moodle forum direct to all
  - further feedback on problem areas for students
  - teaching staff have ‘finger on pulse’

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Refinements: ‘just-in-time’ teaching philosophy

Wednesday

- Tutorials & lectures enriched and enhanced
  - tutors address issues in tutorials
  - increased student-student & student-faculty interactions (even faculty-faculty!)
  - lecturers can revisit problem areas in later lectures

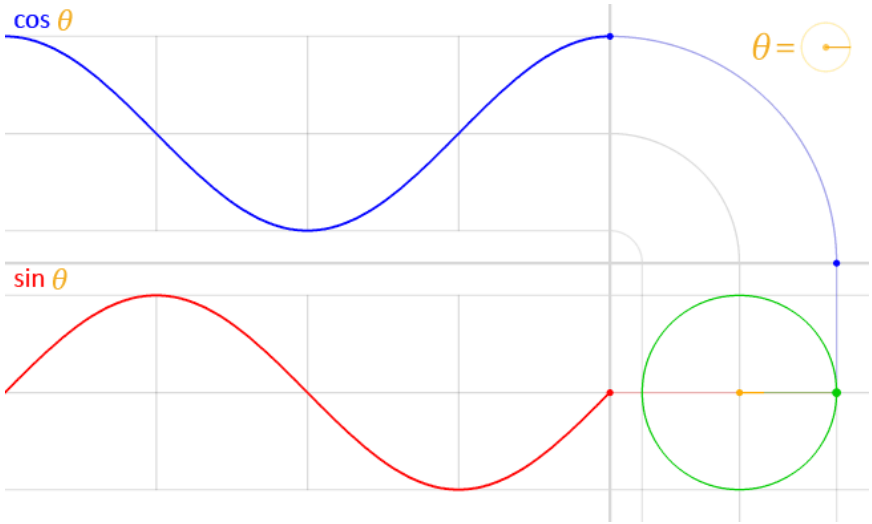

Image: WikiMedia Commons — user: LucasVB

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Looking Forward

- Further efficiencies in coordination
  - reduction in number Level 2 tutorial groups (80 → 19)
  - Level 1 redesign applying all we have learnt
- Identify non-engaged students and intervening
- Providing Advisors of Studies with actionable information
- Tailoring interventions accordingly
- Student retention

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Reflections: what have we learned?

- We produce large volumes of data — interrogate it!
- We can increase feedback without increasing workload — but this requires:
  - Efficient teamwork
  - Integration of technology
  - Enthusiasm