Using STACK at the Open University

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The Open University

The Open University
50 YEARS

The Open University

- Europe's leading distance learning organisation

- Mainly part-time students
  - Study at home
  - (Local) tutors

- $\sim 175\,000$ student headcount

- $\sim 65\,000$ student FTE

- ~ 1000 academic staff

- ~ 5000 part-time tutors

(Data: 2017/18)

The Open University: Mission

Open to:

- people
- places
- methods
- ideas

- No formal entrance requirement
  - 50% students have one A-level or less
- Students aged 18 (and less) – 80 (and more!)
  - Median age of new undergraduates: 28 years
- 52% students study while working
- 19% active students ($\sim$22000) have a declared disability

(Data: 2016/17)

- Enable (remote) students to practise mathematics *with immediate feedback*
  - ► algebra
  - ► higher-level skills

- Randomised questions, with corresponding solutions

- Multiple attempts

- Deadlines set a pace through the module

2006 I started at the OU: "Maths online" project
(Had previously seen STACK at a MSOR event)

Colleague also seen STACK at a conference and was keen.

2007–10 CETL project trialling own installation with students.
- "Campaigning" for OU adoption
- Subject specific v general developments
- Concerns over robustness and security
- OU involvement with redeveloping STACK
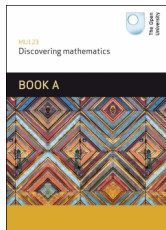(Coincided with Tim Hunt's redevelopment of Moodle quiz.)

Find the general solution for the ODE
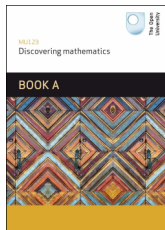
$$\frac{d}{dt}x = 4\sin(3t) - 3\cos(3t)$$

$x =$ [   ]

Submit

2010: Discovering mathematics (MU123)

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  - Multiple-choice, numerical
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- Some issues: "Give your answer as a number without units"
  - "£26"
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- Maintenance laborious (still want to migrate to STACK . . .)
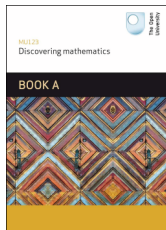
A new hope

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2014 (Feb) Launch of *Essential Mathematics 1* (MST124)
- ~3000 students
- One practice STACK quiz for each of 12 units
- Four summative STACK tests
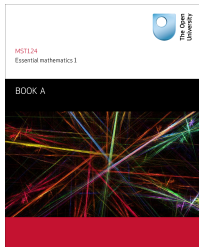
Question 3 Tries remaining: 3

Marked out of 1.00 | ⚑ Flag question

Find the integral

$$\int \cos(2x + 3)\, dx.$$

$\int \cos(2x + 3)\, dx =$ [   ]

Check

The students strike back

A few teething troubles!

- Students do not read instructions
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- $\mathrm{Sin}(x)$ not $\sin(x)$
  - ► Overcame with validation improvements

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- But no *system* problems!

2014 (Oct)
Second presentation of MST124
Launch of *Essential Mathematics 2*
(MST125)
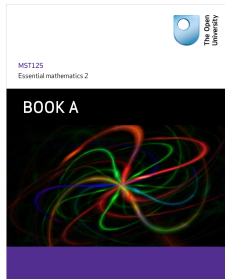
- Much "tidying" of questions

- Much happier students

Student Quotes

I do value the practice quizzes because you do get practice, the feedback explanations are very good and detailed

[I] have done two runs of the practice quiz which has made a big difference for me and will become something I will be doing much more as helps so much

I have been doing the practice quiz every morning now for 2 weeks ... I managed 100% on one of the quizzes and over 90% now on all of them so my confidence level is going up!

The practice quizzes were excellent and I think absolutely essential for consolidating your understanding of the subject. I must have done each one 10 times before taking the relevant iCMA

[The practice quizzes] were useful because they highlighted specifically which areas you weren't comfortable with, so you didn't have to go back and revise the entire chapter.

Mathematics

Undergraduate

(MU123)	(from Oct 2016)	∼3 500 students/year
MST124	(from Feb 2014)	∼3 000 students/year
MST125	(from Oct 2014)	∼1 400 students/year
MST224	(from Oct 2013)	∼430 students/year (partly STACK)
M303	(from Oct 2015)	∼150 students/year

Postgraduate

M823 (from Oct 2016?) ∼100 students/year
M820 (from Oct 2017) ∼130 students/year

Revise and Refresh

R&R for MST124 (from July 2016) ∼200 students/year
R&R for MST224 (from July 2017) ∼200 students/year

Engineering

T193   (from Apr 2017)   ~1000 students/year
T194   (from Oct 2017)   ~400 students/year
T271   (from Oct 2018)   ~700 students/year
T272   (from Apr 2019)   ~420 students/year

Computing

TMXY311   (from Oct 2019)   ~50 students/year

Using the paper Enigma machine you downloaded from the module website using the first three letters of your last name as the initial positions for the rotors, encode the word "ROSE"

Please enter the first three letters of your last name (the initial rotor position):   HAL

Please give your encoding of "ROSE"   QLOY

Check

OU Question type usage

Questions answered: 1 Jan 2015 - 1 March 2016
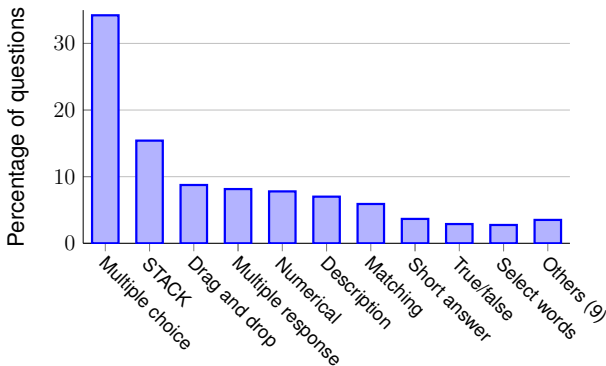
2017/18

- ~6% of database questions are STACK
- ~15% of questions *answered* are STACK
- ~1 000 000 STACK questions answered per year

Future uses

- More modules, as they are revised

- "Early start" resources

- Pre-entry diagnostic quizzes
  - with results available to educational advisors

- Students in Secure Environments

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  - ‣ How long to write a question?

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- Stragetic time-poor students

I like the practice quizzes, you can do lots of them until (hopefully) the lights come on.

These quizzes made a big difference to me coming to grips with the material. They were extremely useful! Thank you!

When I've finished a Unit I do the Practice Quiz over and over again until I get a really high score.