

Numbas Update

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NUMBAS

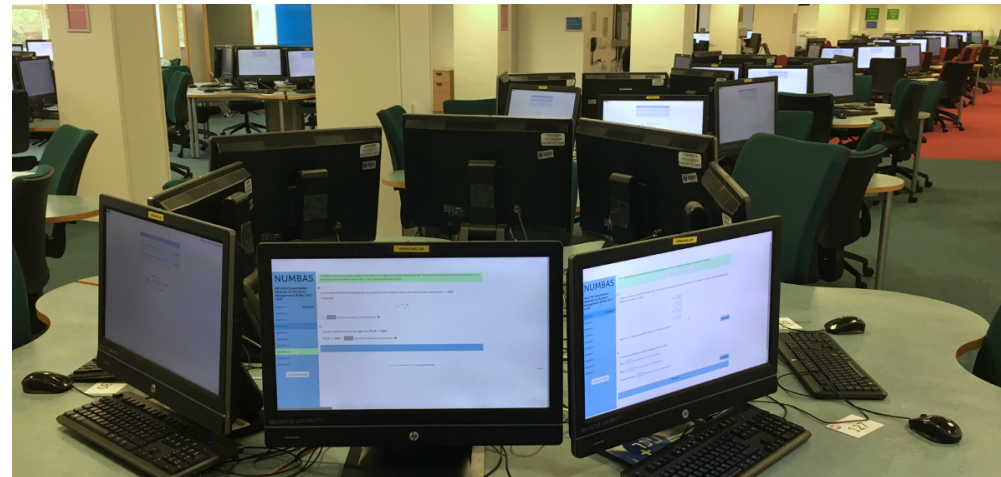


Xrun

In this update

I'm focussing on Numbas for exams / summative assessment

- New Numbas application
- New exam lockdown mechanism
- New assessment possibilities: hybrid and whitelisting



Not in this update

I'm not covering the core of what Numbas can do, only updates on how we're using Numbas at Newcastle. See numbas.org.uk for full details and a demo.

The collage displays various Numbas question types:

- Geometry:** A trapezoid with a top base of 150 and a bottom base labeled with a question mark. It is divided into several triangles, with some colored yellow and others orange.
- Fluid Dynamics:** A diagram of a tank with a volume $V = 500 \text{ L}$. An inlet at the top has a flow rate $q = 110 \text{ mL/s}$ and a concentration $C_p = 50 \text{ mg/L}$. An outlet at the bottom has a flow rate of 110 mL/s .
- Calculus:** A network diagram with nodes A, B, C, and E. A function $f(x) = 3x^7 + \xi$ is given. The derivative is calculated as $\frac{df}{dx} = 21x^6 + 48x^5 + 9$, with the final result $21x^6 + 48x^5 + 9$ marked as correct with a green checkmark.
- Matrix:** A 2x2 matrix is shown with rows and columns defined. The matrix is $\begin{pmatrix} 2 & 3 \\ 4 & -1 \end{pmatrix}$, and the Python code `seq[-1]` is provided to access the last element.
- Integration:** A graph of a function $f(x)$ over the interval $[0, 1]$ is shown, approximated by three rectangles. The x-axis is divided into three equal-width intervals.

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The New Numbas application integrates closely with Canvas to launch automatically if installed (like Zoom).

We strongly recommend using this for summative assessment.

Exam lockdown

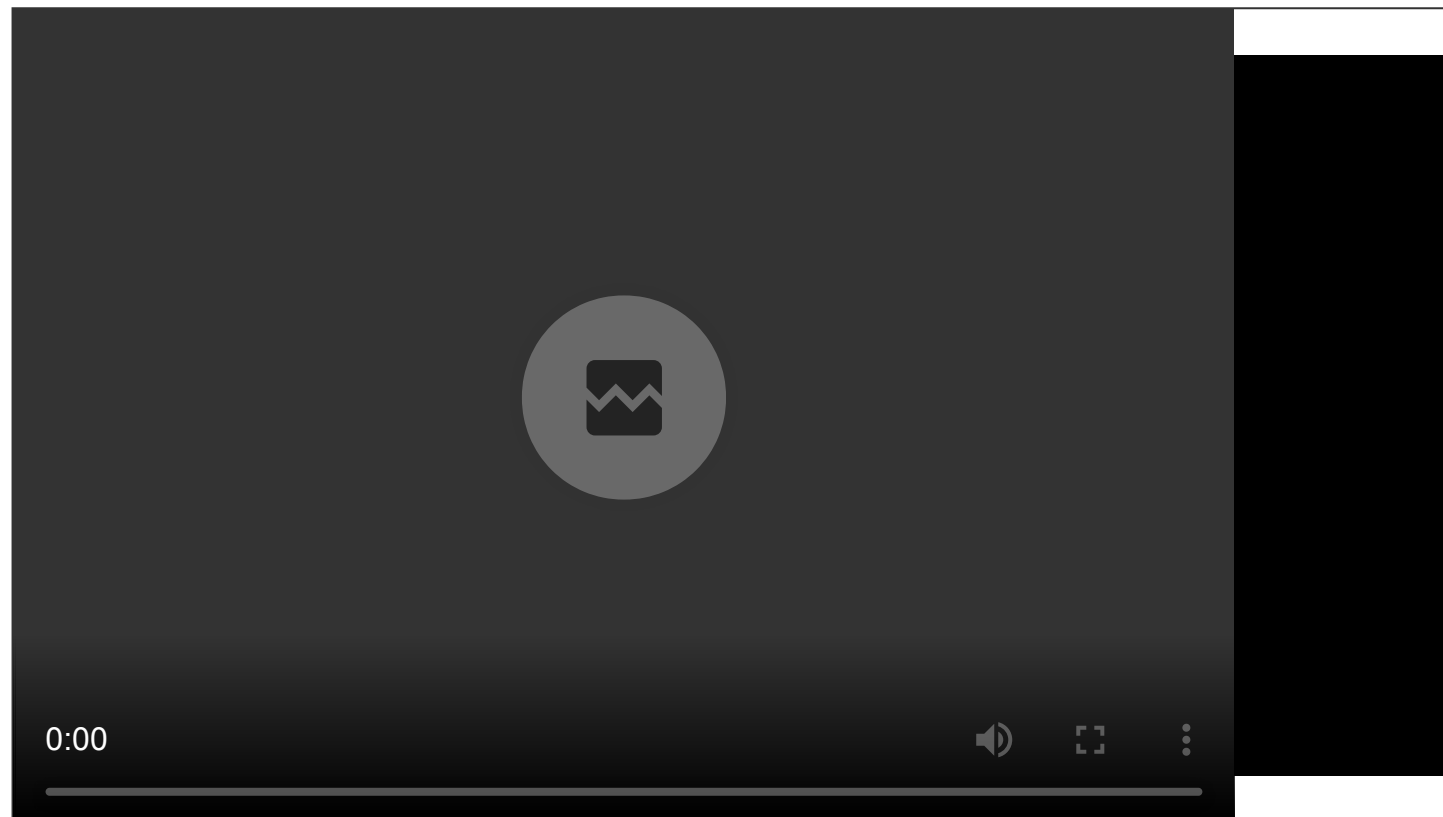
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In semester 1, we moved to Safe Exam Browser, which is a much slicker start to exams.

SEB & Numbas integration



Whitelisting

We have tested and run exams using whitelisting in semester 1: SPSS and OneNote used so far.

One use case is that Numbas can generate files to work with in e.g. SPSS, R, MATLAB, Python and mark student's subsequent answers.

The following data arose in a comparison of the effects of hydration on the time taken (in minutes) to complete a set of exercises. There were three groups of subjects;

- group 1 (fully hydrated),
- group 2 (partially hydrated),
- group 3 (dehydrated).

The data are contained in the SPSS worksheet [hydration.sav](#) (click to download).

a)

Analyse the data using one-way ANOVA to test the null hypothesis that the mean is your conclusion?

☐ We reject the null hypothesis at the 0.1% level ☐ We reject the null hypothesis

region	id	age	sex	region	deficit	relig	gnd	attend	gnd
1	01000001	25	1	1	1	1	6	7	
2	01000002	25	1	2	1	1	6	5	
3	01000003	25	1	3	2	1	6	5	1
4	01000004	25	1	2	1	5	2	0	
5	01000005	24	1	5	2	1	6	3	
6	01000006	24	1	3	2	1	6	7	
7	01000007	24	1	3	2	2	6	3	
8	01000008	24	1	3	2	2	6	3	
9	01000009	25	1	5	2	1	6	3	
10	01000010	25	1	6	2	1	6	7	
11	01000011	25	1	6	2	1	6	2	
12	01000012	25	1	7	2	1	6	3	
13	01000013	25	1	8	1	1	6	3	
14	01000014	25	1	1	2	1	6	6	
15	01000015	25	1	3	2	1	2	1	
16	01000016	25	1	3	2	1	6	6	
17	01000017	25	1	3	2	2	2	3	
18	01000018	25	1	7	2	2	6	3	
19	01000019	25	1	1	2	4	6		
20	01000020	25	1	3	1	2	3	2	
21	01000021	25	1	6	2	2	6	2	
22	01000022	25	1	6	1	2	5	5	

Hybrid formats

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Hybrid formats offer a solution to focus marking time where it is needed.

- Free text box for answers marked later
- Write on an answer book questions

What are the key steps in a thematic analysis as described by Braun & Clarke (2006)'s seminal paper?

My answer

✖

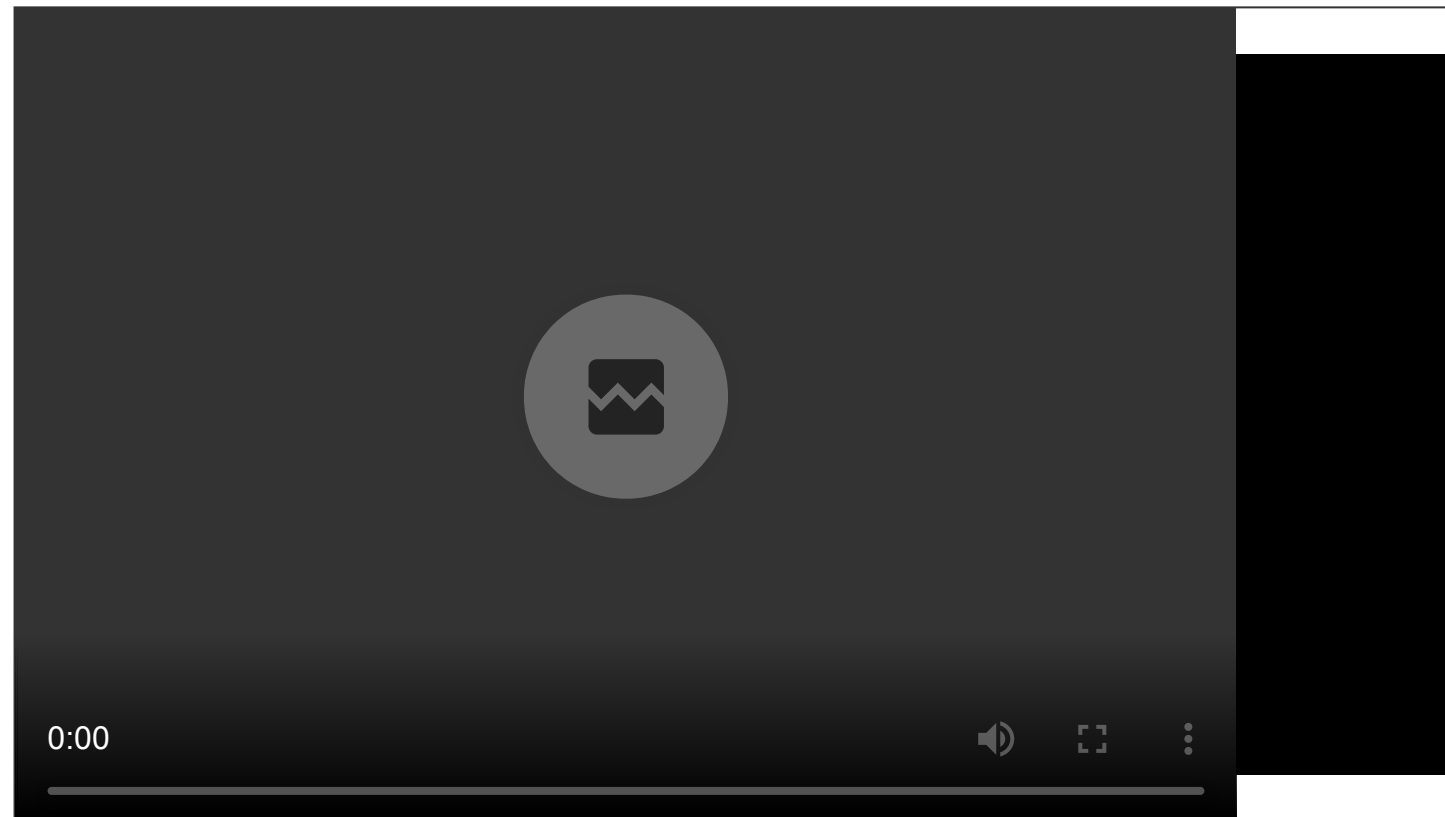
Submit part

This answer will be marked by hand.

Take home exams

In Maths, Stats & Physics, we're also using hybrid formats, with parts of questions where students upload their work to Canvas for manual marking.

Programming is a good example, allowing auto-marking of code, but e.g. plots marked manually.



Looking ahead

For semester 2:

- More guidance for colleagues preparing Numbas exams, in terms of settings to use and backup papers.

Challenges:

- Safe Exam Browser will require ongoing support to run Numbas exams, if Inspera exams move to IEP.
- Instructions for hybrid need to be clear.

Questions?