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Using Bespoke ReView Screencasts to Enhance the Student Learning Experience in Chemical Engineering

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> It's the little things, because we are proficient in (MS) Excel and Word but what makes the difference between a good report and an extremely good report is the details. So that's what she was focusing on.
>
> Level 5 student

Using Bespoke ReView Screencasts to Enhance the Student Learning Experience in Chemical Engineering

Reaction engineering is a core chemical engineering topic that relies heavily on integral calculus and mathematical modelling. At Teesside University, it is taught in modules across two years – simple reactor modelling at Level 5, and complex reactor modelling at Level 6.

Whilst many students demonstrate high levels of attainment on both modules, the topic is considered challenging and a significant proportion struggle to master the mathematics contained within.

This content is assessed via examinations requiring derivation of mathematical relationships, and computer-based coursework requiring presentation of data analysis and mathematical modelling using Microsoft Office 365. To support this, two types of bespoke screencasts have been produced.

Approach

Explanatory Screencasts

Originally, the Level 6 derivations were demonstrated during the lecture with a supplementary typed handout.

However, comprehension was poor even amongst those who engaged well. Students complained that during revision, they couldn't remember why a particular mathematical manipulation had been performed and therefore couldn't complete the derivation.

Screencasts were introduced to resolve this issue, with a focus on keeping them succinct. They were designed to reinforce the lecture content, refresh the student's memory and support revision.

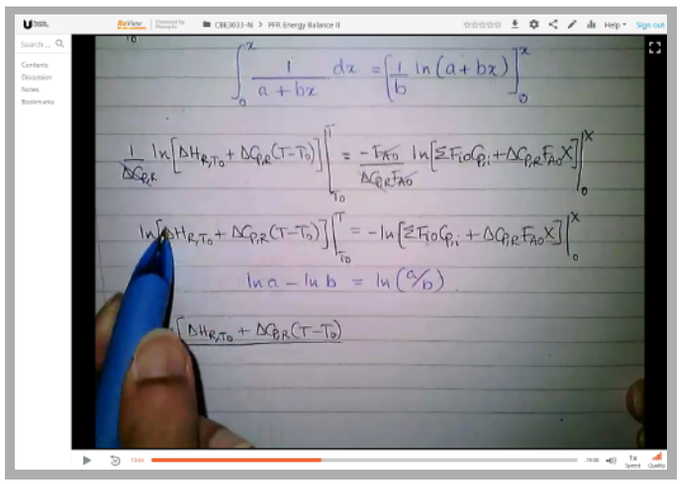

Fig. 1 Video still of explanatory screencast

The screencasts were generated by capturing handwritten narrated walk-throughs of the derivations (see Fig. 1). Typed handouts were still provided for additional support.

Feedback Screencasts

The Level 5 coursework assesses the understanding of technical concepts, as well as the presentation of data and mathematical derivations. Students are encouraged to consider the professionalism of their MS Excel and Word submissions beyond what they've been taught previously.

Analysis of submissions revealed that whilst students could use software to provide information and obtain results, they weren't as proficient at presenting these in a professional manner. Furthermore, they weren't familiar with inbuilt functions that could improve their efficiency.

A bespoke screencast was created to communicate general feedback and software tips. Whilst there are online tutorials that cover similar topics, this screencast was tailored specifically to the assessment and was therefore contextualised. The screencast clarified where students had lost marks on data presentation and provided them with some useful tools for future assignments.

> The videos were extremely helpful in my exam revision, very easy to follow and completely covered the methods we were using so there was no room for doubt. I got the most use out of them when I completed tutorial questions on my own and wanted to go back for confirmation that I was doing it right.
>
> Level 6 student

Outcome

Explanatory Screencasts

59% of eligible students have accessed these and many of the later screencasts have been generated in response to student requests.

It has emerged that students engage with the screencasts at different times, sometimes long after the topic is covered in class (see Fig. 2). Most students access the screencasts multiple times, with some Level 6 students returning to their Level 5 screencasts for a refresher.

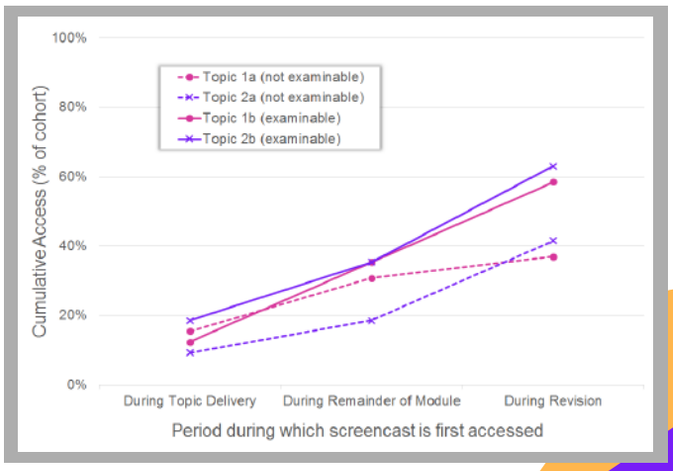

Fig. 2 Analysis of cumulative access for typical explanatory screencasts

Feedback Screencasts

Only 29% of eligible students have accessed these but many of those who have, have used the content in other assignments. They have also recognised the usefulness of the information beyond a single assessment or module.

Key Points

- Students prefer short screencasts, and the majority replay specific sections that they need help with
- Students prefer screencasts to static text as they are more engaging, and suitable for different learner styles
- Screencasts are an effective medium for conveying general visual feedback to students
- Students recognise and appreciate the value-added aspect of screencasts that provide holistic assessment support

Challenges and Next Steps

There is a tendency for students to request screencasts for a broad range of topics. Whilst requests are encouraged, the tutor must act as curator and identify the requests worth pursuing so that the screencasts retain their purpose.

A potential improvement is to better utilise the features within the ReView (Panopto) software. Earlier videos can be updated with tables of content, and comments can be activated to facilitate interactive engagement.

Finally, whilst students have found the screencasts useful, engagement levels could be improved. This could be achieved via better signposting, as well as by referring to the screencasts within lectures to highlight their relevance.

Scan the QR Code to watch an example of the explanatory and feedback screencasts