

Case Study Template : Designing modules for the digital age

Designing modules for the digital age

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Video: <https://lboro.cloud.panopto.eu/Panopto/Pages/Viewer.aspx?id=7f4e60e6-4ade-49c0-acee-ad3c00cce1f1>

Abstract

This case study looks at the development and delivery of a new undergraduate module 'Battery technology' and shows how embracing modern digital teaching tools with traditional teaching passion can lead to a positive learning experience from the students.

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1. Background

Batteries are going to replace combustion engines in the vehicles of the future. Therefore, our Automotive Engineering graduates need to be prepared for this change and have the skills required by industry to lead this transition. To reflect this need I proposed and set up a new optional third year undergraduate module 'Battery technology' (TTC202) to introduce the concepts of electrochemistry, batteries, and electric vehicles. Having been an academic for just over two years, this was the first new module I have developed which gave me the opportunity to apply techniques I had encountered during the training for my FHEA.

The main challenges were maintaining engagement during online delivery, preparing for the uncertainty of face-to-face teaching restrictions and most significant, getting the students interested in the topic! Many automotive engineering students tend to dislike modules that contain significant amounts of electrical engineering or chemistry, so it was not clear how they would engage with learning about the fundamentals of electrochemistry required for batteries!

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2. Methodology

Starting a new module is a lot of work, but does present a clean slate and plenty of opportunities. My methodology was to design and deliver high quality teaching material that can be used for both online and in-person teaching and to try and overcome the challenges of student engagement in online sessions. Rather than focussing on a single tool, my approach consisted of four areas:

1. **High quality on-demand teaching content.** Outside of their academic studies, many students will be consuming free media content from vloggers or streamers. Students should expect that the content they are paying for through their tuition fees at least matches the quality of free content. To improve the quality of my pre-recorded sessions I set up a green screen and lighting rig in my office then edited recordings in Adobe Premier Pro to place myself next to my slides and better replicate the body language cues that students would see in an in-person lecture.
2. **Access to teaching materials** – I made full use of the Learn tile format to organise content week by week. I made sure all the pre-recorded and live recordings were embedded within the learn environment and made additional categories for tutorials and further reading. All content could be accessed within two clicks from the main module page.
3. **Interaction and reflection** – I utilised Vevox to encourage interaction and had a recap section at the start of each live session where I would ask questions on the previous weeks content. This helped reinforce learning and allow me to provide informal feedback on answers.
4. **Making the content relevant** – I love batteries, but learning about intercalation of lithium-ions might not be what students were signing up for when they chose Automotive Engineering! To help relate the fundamental knowledge to the application I ran a 'news' section at the start of each session to give an update on what was happening in the electric vehicle industry that

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week.

3. Issues

Developing new skillsets – I am not a media producer and have never used a green screen before so there was a steep learning curve in producing high quality pre-recorded content. I taught myself how to use the tools in Adobe Premier Pro from online tutorials and experimented with different lighting, audio and camera setups.

Gauging engagement – The biggest issue was judging how the students were responding to new material in a topic that would be very new to many of the students. Was I going too fast or slow and was the content pitched correctly? This is really difficult to judge online with 40 muted students and no visual clues! The Vevox questions helped here, along with looking at viewing data for recorded sessions and trying to promote more questions in tutorials.

Tutorials – I have struggled to represent the interaction during tutorials online. Normally I would walk around the room and actively speak to individual students to see how they were doing. This is very difficult to replicate online. I tried to promote engagement through online tutorials through wider discussion and offering 1 to 1 calls, but still to not have a way to identify students falling behind.

4. Benefits

Designing the lecture content for mixed delivery worked well. The pre-recorded content flowed into the live session content and presented a cohesive delivery structure throughout the module that the students appreciated. Dedicating the first 10-15 minutes of the session to a battery news segment and interactive quiz also worked very well for myself and the students. The vevox tool worked well here and these sections were highlighted in positive comments by the students.

5. Evidence of Success (if available)

The main evidence is from the recent student feedback survey with is overall very positive 4.90/5 and 4.98/5 for module and lecturer specific questions respectively from a 40% response. Evidence of the techniques working can be seen from some of the written comments below:

“The content was delivered in a well structure way which was engaging and easy to follow. Overall, I think this has been my favourite module for the whole of my duration of my degree so far and would recommend to future students to do. Well done to Ashley Fly for creating an amazing module.”

“The interaction with the class was great. I loved the in-class quizzes at the start – it got your brain thinking!”

“Very modern application & the weekly updates surrounding real world battery development from Ashley improved my enthusiasm for the topic.”

“Other lecturers need to be shown how this module has been run and take note. The level of teaching is far better than a lot of much more experienced lecturers, and the tutorials/lectures/recorded videos were clearly organised into weeks, unlike a lot of other modules.”

“Ashley went above and beyond I've seen any lecture go regarding the lectures and pre-recorded lecture content. The videos were engaging, and I liked how the lectures started with news of batteries and a quiz you can participate in, to recap knowledge. His passion for the subject shines through and it made me really interested too to learn about batteries.”

“The module was incredibly interesting and has shone light on something which I did not understand prior to

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starting this module. Ashley's delivery of the module was fantastic, both in On Demand and Live lecture sessions, and his tutorials were incredibly helpful."

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6. How Can Other Academics Reproduce This?

The successes of my approach can be applied to any academic discipline. Other than £40 of green screen and LED lights I only used tools already available through the university. All you need to do is take a fresh look at your existing material and think about how it best suits the delivery method, and if your use of interactive tools meets the modern expectations of students. That and a passion for the subject you are teaching! The biggest limiting factor is time, it takes a longer to make better quality material, but if done well it should last a few years before another major update.

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7. Reflections

Aside from the mixture of digital tools, the biggest contributing factor to the success of the module is that I wanted it to succeed for both me and the students! This meant I put more time and passion into the development of materials and was more invested in it rather than recycling old material. I would love to further improve the quality of my videos, perhaps moving away from over reliance on Powerpoint. I would also like to encourage more open interaction beyond the relatively constrained Vevox answers to improve online tutorial sessions.

8. References *(if available)*

Link to pre-recorded lectures <https://lboro.cloud.panopto.eu/Panopto/Pages/Sessions/List.aspx?folderID=469de7a6-2298-41cf-af80-acb100b797e3>

Link to learn page <https://learn.lboro.ac.uk/course/view.php?id=15811>

Please email me if you want to borrow my greenscreen! A.Fly@lboro.ac.uk