**Using** **supplementary screencasts in teaching computational tools to undergraduate chemical engineering students**

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**Highlights**

* Computational Tools in Chemical Engineering.
* Supplementary screencast videos.
* e-learning material.

**1. Introduction**

The application of screencast videos in teaching chemical engineering courses and their advantages have been reported [1], [2]. Screencasts are mainly used to enhance students’ learning by giving them extra support through explaining certain topics or solving examples in short videos with narrations. One of the main advantages of using screencasts is that students with mixed abilities can benefit from these videos and replay them as many times as they need which will also increases student confidence [3]. This is also very useful for students with English as their second language, with hearing problem and dyslexic students.

Screencasts can either be used for flipping teaching approach [4], [5] or supplementary [6] to conventional teaching methods. In the latter, the videos are short (under 10 min) and are topic based to keep the attention of students. Also, short videos are more encouraging for students to go through this material. In this paper we will be reviewing the use of short screencast videos (~ 3 min each) as additional supplementary resources in teaching computational tools in chemical engineering.

**2. Methods**

In the Department of Chemical Engineering at University College London (UCL), we have already established using e-learning material to enhance students’ learning in computational tools, and we have received very positive feedback from our students that it helped them to improve their learning [7]. Our undergraduate students receive some in–class lectures on use of computational tools (gPROMS, GAMS, MATLAB and Aspen Plus) followed by some computer lab tutorials. They also benefit from online-resources, which are particularly designed as supplementary material to give them extra support towards their learning, more specifically the details which cannot be covered during the in-class lectures due to the time restrictions.

After successfully implementing the use of e-learning material mainly in the form of self-learning lecture slides, the department has decided to also incorporate video learning materials in how we teach computational tools (gPROMS) in undergraduate core modules. The use of gPROMS in solving mathematical models, and in particular differential equations, of chemical process engineering is integral to our undergraduate programmes, from Year 1 through to Year 4, during which they learn the main concepts and programming principles in gPROMS. The tool is introduced in an in-class lecture followed by two tutorials in Year 1. In Years 2 & 3 they experience advanced material only through the online resources. Yet more advanced topics are covered in Year 4 through a combination of in-class lectures and tutorials. This initial provision is now augmented by videos that have been developed by Process Systems Enterprise Ltd [8] and which are incorporated into, initially our Year 1, but will also be used for Years 2-4 going forward.

**3. Results and discussion**

The screencast material have very recently been introduced to our first year students and although we have received some positive feedback from those who have used this material, but we will receive more comprehensive feedback by end of the term. At the meantime, the main challenge could be encouraging students to go through this material as these are optional material and some students may not bother to approach the material. Details of students’ feedback will be available to be presented in the congress. We will be reviewing students’ performance through their in-class quiz (of gPROMS) and a coursework in a module known as Computational Modelling and Analysis. We will be comparing their performances to previous years which student did not have these screencast resources. We will also be tracking students’ feedback and comments to Computational Modelling and Analysis, which usually happens at end of the term, and includes the use of gPROSM in solving model equations in this module.

**4. Conclusions**

The use of supplementary screencast material has been incorporated into teaching one of the computational tools for first year students in chemical engineering programme. So far, we have received positive feedback from students, but the details of the impact of these additional learning resources will be available by end of the term through their assessment results and also through the regular end of the term student survey.

**References**

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