



Using text-scrolling to increase student engagement in the STEM classroom: a collaboration

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Presentation abstract

The benefits of using active-learning approaches to increase student engagement and participation in the HE classroom are well known (Allsop et al., 2020). In STEM disciplines specifically, active-learning approaches can contribute to a reduction in achievement gaps for underrepresented students by promoting self-efficacy and a sense of belonging (Kovarik, Robinson and Wenzel, 2022). Despite these benefits, academics in those disciplines may be reluctant to adopt active learning for reasons such as lack of familiarity or more time spent in traditional, lecture-style delivery (Arnaud, 2021).

This presentation reported on the outcome of a small-scale pedagogical innovation in one tutorial of a first-year undergraduate theory module in Chemistry. The aim was to increase students' classroom engagement in the tutorial by using a text-mapping activity with scrolled research papers (Abegglen et al., 2019), with the additional benefit of introducing tutors to this active-learning technique. The transcript of a professional conversation between a Chemistry lecturer and Learning Developer discussing the approach along with slides outlining a typical session were circulated to tutors a week prior to the timetabled tutorial.

Qualitative feedback from tutors was presented to indicate the success of the text-mapping activity as a way of increasing student engagement in the tutorial. Insights were also gained about tutors' own perceptions of pedagogical value and confidence in adopting such approaches in future. Implications were presented for how the first-year tutorials

might be redesigned to include more active learning, as well as how Learning Developers can work in collaboration with academic colleagues in STEM programmes.

Keywords: active learning; learning environments; student engagement; collaboration.

Community response

The collaboration and rapport demonstrated between Suzy, a Learning Developer, and Jenny, a T and S academic, was a fantastic example of what collaborative practice looks like. Jenny's experience of the challenge of student engagement and attendance reflected something experienced by many module teams. Could collaboration/discussion with Learning Developers about the challenges of engagement be part of the solution?

It also demonstrates one of the reasons why LD can have an uncomfortable position in HE: some of our best work happens when we create something where the individual LD and subject ingredients become invisible or impossible to separate. But what if we then need to justify our existence? We need more work like this, but perhaps also clearer communications about the fact that this work is better not because there is a distinct LD element in it, but because the LD elements have infused what subject lecturers do.

It was fantastic to see the impact that close working together can have in a large STEM department, which resonates with my own experience in practice. The concept of the learning cycle of perceptions and passive or disengaged behaviours that students may fall into when presented with answers rather than having the opportunity to problem-solve collaboratively during tutorials really resonated. The presenters' reflection on the clash between assumptions made by teaching staff about the aims of a tutorial and the pedagogical value of this contact time were extremely useful. Can we sometimes be so focused on delivering content in teaching sessions that we overlook the inherent value of forging community through collaborative problem-solving, discussion, and working through our ways of thinking together? Providing this space for 'reflective, critical conversations with a non-subject specialist', brings a novel approach to creating learning experiences.

Next steps and additional questions

- What is the scalability of this approach to student engagement?
- Can a framework of active-learning approaches through digital solutions be created to afford transferability to other subjects and modules?
- What are the different forms of active learning that may create effective and dynamic learning environments which inspire and motivate?
- Does the study show that the students benefited from knowledge retention, deeper understanding, and developed a motivation for self-directed learning?

Authors' reflection

When we decided to present together at ALDCon24, we had hoped to share something interesting about how academics and Learning Developers can collaborate on pedagogical innovations in STEM disciplines. With insightful questions from participants on the day, and with the community responses recorded here, what we came away with were the ideas and inspiration to take our small-scale project further.

We were both struck by the positive response to what one response termed our 'collaborative practice'. While the practice context was using an active-learning approach to address poor student engagement, some of the most important insights for us were gained simply by having conversations about the way programmes are delivered in Chemistry. As a complete non-specialist with no disciplinary experience, Suzy was able to ask questions about the role of tutorials in student learning, about their pedagogical purpose and value, and how they differed from workshops and lectures. This allowed Jenny to reflect on her own assumptions and those of her academic colleagues, and she designed survey questions that exposed contradictory underlying assumptions that could account for some aspects of the cycle of low engagement. Our ability to have these 'reflective, critical conversations', as one community responses highlighted, was largely due to our good working relationship. This reminds me of how much LD work relies on developing relationships with a whole range of colleagues, but especially teaching academics.

As a direct result of insightful questions from participants on the day, we have plans to develop the text-scrolling activity. Plans include bringing the same 'mapped' scrolls back in the second semester for a deeper look at the introduction section of journal articles, for use as a model for students' own lab-report writing. Jenny is also keen to make explicit connections for students between physical and electronic texts by modelling how text-mapping can work with digital formats, especially given that we know most students will access journal articles electronically.

In terms of research, focusing on the impact of this active-learning technique on student learning is the natural next step. Time constraints for this study meant that we were restricted to gathering survey data from tutors. This meant that student behaviour in tutorials acted as a necessary but imprecise proxy for student engagement. We hope to return in future with some further insights from students into the benefits of our collaboration.

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Jenny Eyley is a lecturer in Chemistry at the University of Leeds. Alongside her teaching, she is primarily interested in Chemistry education and scholarship, with a focus on surfacing skills, the hidden curriculum, and the language and linguistics of chemistry.

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