

# ENHANCING STUDENT ENGAGEMENT AND SUCCESS THROUGH ONLINE INTERACTIVE MICRO-LECTURES

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**SUBTHEME:** Modes of Learning

## PROBLEM

Following observations teaching second-year science students, traditional live lectures were failing to maintain student engagement and did not accommodate their various learning styles. Ultimately, this resulted in decreased retention rates, higher failure rates and poor student feedback. This highlighted the need for a more interactive and engaging approach to content delivery.

## PLAN

To address this challenge, I devised a plan to transition from traditional live lectures to an online lecturing environment. Drawing from educational literature that emphasises the effectiveness of micro-lectures and active learning in improving student engagement and performance (Guo et al., 2014; Freeman et al. 2014), I segmented each lecture into short 10-minute videos, each focused on a specific learning objective. These micro-lectures were enhanced using H5P, adding interactive questions and activities, fostering active learning and immediate engagement with the content (Brame & Biel, 2015).

## ACTION

I implemented the plan by producing and distributing the micro-lectures online, ensuring each video was interactive with embedded questions and activities. Students engaged with the content before attending practical sessions, which were designed to build upon the lecture material. This approach provided a cohesive learning experience, linking theoretical knowledge with practical application. These changes resulted in significant improvements in student outcomes. The average unit mark increased from 56 to 65, aligning with the average Weighted Average Mark (WAM) and the fail rate decreased dramatically from 33% to 5%. Student feedback scores also improved, with many students expressing greater engagement and satisfaction with the new format.

## REFLECTION

The new approach was well-received by students and staff, who noted significant improvements in engagement and understanding. The positive shift in student performance and feedback highlighted the success of integrating interactive elements into the micro-lectures. While the transition was effective, future iterations could benefit from incorporating more diverse interactive elements and gathering more frequent feedback to continuously refine the approach. These results underscore the effectiveness of this innovative teaching approach and our commitment to continuous improvement in education, demonstrating the value of adaptability and responsiveness to student needs.

## REFERENCES

- Brame, C. J., & Biel, R. (2015) Test-enhanced learning: the potential for testing to promote greater learning in undergraduate science courses. *CBE Life Sci Educ.* 14:14:es4
- Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014) Active learning increases student performance in science, engineering and mathematics. *Proc Natl Acad Sci USA*, 111:80410-5
- Guo, P. J., Kim, J., & Rubin, R. (2014) How video production affects student engagement: an empirical study of MOOC videos. In *Proceedings of the first AMC conference on Learning @ scale conference*. Association for Computer Machinery, New York, NY, USA, 41 – 50

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