To block or not to block: Does teaching delivery method affect students' performance and learning experience?

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Thursday 2 September, 11.30:13:00 BST

In this paper, we investigate the link between lecture delivery schedule and students' performance and learning experience. We use three course delivery categories: conventional delivery refers to engaging in 3 to 4 hours of teaching activities each week; block teaching refers to an intensive schedule with continuous teaching of one course for 1 to 2 weeks; and mixed delivery refers to a smaller block of teaching spread over the semester with study time in between.

To explore the link between student performance and delivery method, we exploit a natural experiment to conduct quantitative analysis of summative assessment results from three courses in a petroleum engineering MSc programme. Using a difference-in-differences approach, we focus on the control and treatment groups in our natural experiment to study the final course marks from three modules: Formation Evaluation (FE), Reservoir Engineering (RE), and Drilling Engineering (DE). In our dataset, students' assessment performance is based on final marks obtained in each course by two cohorts of full-time students studying at the Edinburgh campus of Heriot-Watt University from two different academic years as shown below:

Course / Academic Year	2015-16	2016-17	Group
Reservoir Engineering (RE)	Block	Conventional	Treatment 1
Drilling Engineering (DE)	Block	Mixed	Treatment 2
Formation Evaluation (FE)	Block	Block	Control

Based on the performance of the two cohorts in our dataset across these three courses, we find no evidence that switching from block teaching to conventional delivery increases or decreases the expected course average. However, we do find some evidence that a switch from block to mixed delivery increases the expected average mark. Hence, we conclude that students tend to perform better when courses are scheduled with a mixed schedule rather than a block schedule, but we find no clear distinction between mixed and conventional delivery methods.

Further, we design a questionnaire to focus on the students' learning experience in each delivery method. In addition to analysing the responses to the questionnaire, we use this information to select focus group participants, which has enabled us to ensure that we have as diverse a group of participants as possible. Specifically, we include students who like and dislike block delivery keeping in mind elements of their backgrounds. A key finding is that students with work experience prior to joining the MSc programme were more likely to prefer block teaching than their peers without work experience.

Our analysis of the focus group transcription highlights that our participants used some keywords and phrases repeatedly depending on their views. Those who indicated that they enjoy block teaching in the questionnaire opted for such words as “subject”, “one”, “just”, “block”, and “exam.” Meanwhile, those who dislike block teaching referred to “time”, “connect”, “see”, and “knowledge.” Further investigation of more complete statements, rather than individual words, by each of the participants suggests that students with a preference for block teaching are, unbeknownst to them, engaging in surface learning, while those with a preference for other delivery formats are adopting a deep learning approach. Lastly, noting our quantitative results and the general preferences expressed in our focus group session, our findings suggest that a mixed delivery schedule could provide a happy medium that has a positive impact on student performance as well as learning experience.