

Online Learning versus classroom learning: Questioning who learns what

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Should educators demand mandatory levels of online engagement, or “take attendance” for distance learning sessions, such as during the COVID-19 crisis? After all, when teaching in front of an undergraduate student cohort with their many laptops open, it’s likely that quite a few of them are surfing the web or are on social media. Is this kind of classroom attendance really necessary? The COVID-19 crisis has highlighted this question. Even before the pandemic, the ubiquity of lecture capture broke the traditional link between classroom attendance and student exam performance.¹

A small but vocal minority of students complain about attendance requirements. Yet many medical schools still maintain a minimum attendance requirement, although these regulations are changing school by school. We know, and there is clear research in the education literature, that some motivated students are perfectly capable of learning the knowledge tested by multiple choice questions (MCQs) without attending traditional lectures at all! MCQ tests rely on cognitive recognition by providing a cue for your memory (the correct option) that bypasses the need to mentally construct the answer from scratch; so, recognition tests require less cognitive processing, and are easier (when testing the same material), than recall type tests (e.g. fill in the blank or essay). It may be that live learning only benefits problem solving and higher cognition, rather than MCQ-style recognition learning, or live learning may only add to subtle but important conceptual learning, rather than rote learning. In that case, would research based on MCQ tests even be able to detect this additional conceptual learning that is fundamental to physiology?

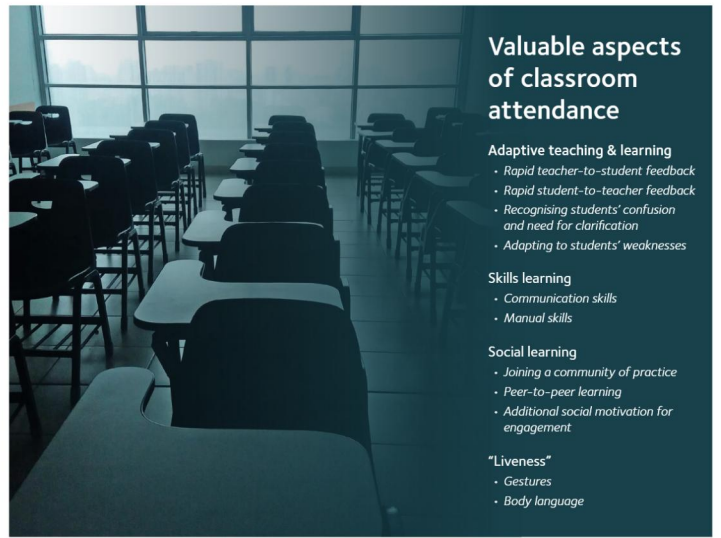
On the question of whether lecture attendance should be mandatory, we recognise that students in scheduled lectures may not be in a ready state for learning. We seem comfortable with students who have mitigating circumstances missing a few classroom sessions. Is that different for students who miss large numbers of classes, particularly if video lectures are available? Does this encourage laziness, disengagement, and sleeping in? The evidence is extremely mixed as to whether lecture capture does actually lead to lower attendance and subsequently lower engagement for some students.^{1,2} Students at the Open University seem to cope with minimal attendance,

although their engagement is strongly encouraged in other ways.

We must frame any attendance or engagement requirements in supportive rather than punitive terms. We know that the best learners use active learning strategies, which are learner-centred and so comprise additional activities (beyond passively listening or reading), in which the student formulates their own cognitions; examples include discussing, researching, self-testing, laboratory practicals or solving problems. Formal active learning strategies can range from a 5 minute in-class exercise to an entire curriculum of problem-based learning. It is worth mentioning that many undergraduates do not like or appreciate the value of formal active learning. One option for those students whose learning is online is to frame our requirements as mandatory engagement rather than attendance; we already have tools to measure online engagement. However, those students who are training to be professionals, such as in medicine, after graduation will need to attend their work daily; surely they should be prepared to accept a minimum engagement requirement now.

What, if anything, is uniquely useful about classroom attendance? Before lecture capture, students only had textbooks, so live instruction functioned to curate and prioritise the vast content; nowadays, recorded lectures can do all that. To answer whether live lectures can or should be replaced by video screencasts, we need to be specific and contextual about the purpose of each live session. Obviously there is a big difference between blended learning, such as when scripted lectures are replaced by videos in flipped classrooms, versus distance learning, when scripted lectures are replaced by videos and teaching texts such as in MOOCs. Might there be other contextual factors (such as the type of module) that determine how students learn online?

A major benefit of live/synchronous learning of knowledge is responsive teaching, including rapid teacher-to-student feedback (see Box). Another is the ability to recognise students’ confusion and need for clarification; switched-on teachers are willing to abandon a teaching plan in favour of addressing student weaknesses, but this does not always happen in a PowerPoint world. Some skills (e.g. manual dexterity and communication) are less learnable



Valuable aspects of classroom attendance

Adaptive teaching & learning

- Rapid teacher-to-student feedback
- Rapid student-to-teacher feedback
- Recognising students’ confusion and need for clarification
- Adapting to students’ weaknesses

Skills learning

- Communication skills
- Manual skills

Social learning

- Joining a community of practice
- Peer-to-peer learning
- Additional social motivation for engagement

“Liveness”

- Gestures
- Body language

online. There are “softer” benefits to live classes such as socially motivated learning, which seems fundamental for developing a community of practice. We still need to make the case for what is special about “liveness” and attending a class, irrespective of the rest of the student’s engagement.

Other contextual matters include age and maturity. In the literature on how medical students learn, it is fundamental to note that USA medical students are postgraduates whereas in the UK they are usually undergraduates. This highlights the confounding factor that class attendance is often a proxy for overall student engagement. Some students may have insufficient self-efficacy or academic reserve to teach themselves. By forcing them to attend, we may increase their engagement. There is already some evidence that making lecture capture available leads to some students not attending.³ If lecture recording does lead to lower attendance and performance, should it be instituted anyway?

Despite students’ strong preference for it, maybe lecture capture is damaging. Is there strong evidence that forcing weak students to attend will cause them to engage and learn? Perhaps only good students

benefit and engage more when mandated to attend. Having no recordings provides an incentive to practise good study habits for their professional careers (e.g. note-taking, attentiveness and keeping up). There is a risk that if we institute recording of all learning sessions, some students might not prepare for class, even if there are individual or team readiness assurance tests at the start of each classroom session. Some may be less inclined to join in classroom discussion if it is always recorded. However, lecture capture aids both accessibility and inclusivity. Some instructors compromise by recording lectures but not the flipped classroom sessions, so that non-attenders miss out. This seems like a retrograde step to motivate classroom attendance by making the flipped classroom the source of emphasis and knowledge curation. Many instructors have mixed feelings about lecture capture.²

Physiological Society Members with an interest in education are getting involved in helping to determine answers to these questions. You can too, by joining an education symposium on conceptual learning plus a classroom attendance workshop at Physiology 2021 in Birmingham. Do you think we should take charge of the educational narrative and develop recommendations

and policies for different educational programmes? What are the factors that determine successful learning outside the classroom? What experiments or data would we need to determine that we are on the right track? How and where would such educational research need to take place? If you are interested in physiology education, we are keen to know your opinion and to have you contribute.

References

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