

Regular demands on attention and memory keep students on task in online courses, study reports

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Credit: pcconlinecourses.com

(Medical Xpress)—Somewhere between the traditional classroom and old fashion home schooling, online learning has emerged as the dominant educational resource. Skyrocketing tuition, particularly at the college level, has sped the inevitable migration to online accreditation. While the benefits are obvious, the loss of those seamless instances of microfeedback between student and teacher makes attention the primary casualty of its rapid adoption. Efforts to bridge this gap and reduce mind wandering among online students are underway at Harvard University, an institution well poised to be a leader in providing online content. A new study in *PNAS* from their psychology department gives one possible solution to the problem. By making attentional demands in the form of brief quizzes on 5-minute intervals, student performance in online courses can be significantly improved.

Even the most highly motivated student still battles the constant urge to search or click on a link to learn more—or less as the case may be. Undoubtedly striking the right balance between freedom and oversight is the central challenge to giving students mastery over a given body of knowledge. Various models have emerged that have garnered massive worldwide enrollment. Free courses at edX.org, coursera.org, 2u.com, Udacity.com have all been highly successful. Perhaps not surprisingly, the call for help in maintaining [selective attention](#) in the absence of the normal controllers has come from the students themselves.

The approach taken by the new Harvard study is based on what they call interpolated memory. It is based upon the idea of interpolating the coursework or task with short [memory tasks](#). Students were given a 21-minute statistics video lecture which was segmented into four periods, each followed up with a 2-minute testing period. The testing period involved brief review, testing, and even unrelated arithmetic. The perhaps predictable results were that [students](#) given the additional retesting at each segment, did much better on cumulative testing done after the lecture.

This formalization of the obvious was corroborated by the student self-assessment in which they invariably reported reduced periods of mind wandering. The study adds rigor to the idea that replacing a human lecturer with a human on a screen can work, provided appropriate considerations for the learning process are taken. A useful analogy might be to consider running on a field compared to running on a treadmill. On your own on the field, you can control your speed at every step, and go in any direction you choose. On a treadmill your pace is set for you. The best performance seems to be somewhere in between, as on a track. Here the goal is set, the student has some freedoms in getting there at their own pace, but is guided at every turn.

More information: Interpolated memory tests reduce mind wandering and improve learning of online lectures, *PNAS*, Published online before print April 1, 2013, [doi: 10.1073/pnas.1221764110](https://doi.org/10.1073/pnas.1221764110)

Abstract

The recent emergence and popularity of online educational resources brings with it challenges for educators to optimize the dissemination of online content. Here we provide evidence that points toward a solution for the difficulty that students frequently report in sustaining attention to online lectures over extended periods. In two experiments, we demonstrate that the simple act of interpolating online lectures with memory tests can help students sustain attention to lecture content in a manner that discourages task-irrelevant mind wandering activities, encourages task-relevant note-taking activities, and improves learning. Importantly, frequent testing was associated with reduced anxiety toward a final cumulative test and also with reductions in subjective estimates of cognitive demand. Our findings suggest a potentially key role for interpolated testing in the development and dissemination of online educational content.

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