



TODAY'S CLASSROOM

## Are You with Me? Measuring Student Attention in the Classroom

<http://teachingcenter.wustl.edu/Journal/Reviews/Pages/student-attention.aspx#.U4ad55RdVHE>

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*Review of Bunce, D. M., Flens, E. A., & Neiles, K. Y. (2010). How Long Can Students Pay Attention in Class? A Study of Student Attention Decline using Clickers. Journal of Chemical Education, 87, 1438-1443.*

Most university classes last 50 to 90 minutes—much longer than the attention span of a typical student. Sustained attention varies widely, and the quality of attention depends on several factors, including time of day, motivation, emotion, and enjoyment. Instructors use a variety of strategies to increase student attention during class—from incorporating demonstrations or visuals to requiring student participation, asking students to turn off cell phones and laptops, and waking up the occasional sleeper. The idea, of course, is that increased attention during a class results in better, longer-lasting retention of the presented information; decades of memory research confirm this basic idea.

How long can you reasonably expect your students to sustain attention in the classroom? One common belief is that the typical student's attention span is about 10 to 15 minutes long. This belief has been reinforced in numerous books and articles on teaching. In a 2007 literature review, however, Wilson and Korn (2007) found no evidence to support this belief. In fact, in an examination of the references given for

this very precise span estimate, Wilson and Korn found that most were based on remarkably imprecise studies of attention. For example, one study found that note-taking by students generally declined over the duration of a lecture. The researchers interpreted this decline as evidence of a decrease in attention; however, they found no direct evidence of a consistent 10 to 15 minute attention span.

In another study of student attention in the classroom, trained observers watched students during a lecture class and recorded perceived breaks in attention (Johnstone & Percival, 1976). Attention lapses were noted during the initial minutes of “settling-in,” again at 10-18 minutes into lecture, and then as frequently as every 3-4 minutes toward the end of class. It is uncertain whether observers can accurately measure students’ attention spans. More broadly, the evidence examined by Wilson and Korn suggests that while there may be a pattern of decline in student attention during a lecture, the length of average attention span has not been determined.

More recently, Bunce et al. (2010) revisited the measurement of student attention during class by asking students in three introductory chemistry courses to report lapses in attention using “clickers” (small devices on which students can remotely register button-press responses to questions or prompts). The courses were taught by two instructors: General Chemistry for Non-Science Majors and General Chemistry for Nursing Students (each taught by one instructor) and General Chemistry for Engineering Students (taught by the other instructor). A total of 186 students were enrolled in these three courses, and 35.3% of the enrolled students participated in Bunce et al. study.

The researchers measured the average length of the students’ reported attention lapses, and they also examined the relationship among attention lapses and various pedagogical methods used by each instructor. Previous studies have focused on the frequency of breaks in attention, but this classroom study is one of only a few that have captured information about the perceived duration of attention lapses.

The students who volunteered to participate in this study were asked to report attention lapses by pressing a button on their clickers after they became aware that they had experienced a period of inattention. The students clicked one button to indicate an attention lapse lasting 1 minute or less, another button to indicate a lapse of 2 to 3 minutes, and a third button to indicate a lapse of 5 minutes or more. The clicker-responses were sent to a computer. Then, this information was mapped onto a timeline of the different pedagogical methods (lecturing, demonstrating, or asking a question) used by each instructor. This procedure allowed the researchers to determine, for example, if reported lapses in attention became more or less frequent, or stayed the same, when an instructor switched from one method to another.

### **Attention Lapses are Frequent, but Brief**

This work produced three main findings. First, the researchers observed that the most frequently reported length of attention lapse was 1 minute or less, suggesting that very short breaks in attention are more common than longer breaks. The second main finding was related to the frequency of reported lapses. If it is true that the students typically have a 10 to 15 minute attention span, one would expect to see a pattern of reported lapses every 10 minutes or so, but that was not what the researchers observed in this study. Instead, across the three courses that were studied, the researchers observed a pattern in which the first spike in reported attention lapses occurred just 30 seconds into a lecture segment, likely reflecting the same “settling-in” period of disruption observed by Johnstone and Percival (1976). The next consistent spike in reported attention lapses occurred at 4.5 to 5.5 minutes into the lecture, followed by another spike at 7 to 9 minutes, and then another at 9 to 10 minutes into the lecture. This waxing-and-waning pattern continued throughout the lecture, with attention lapses occurring more frequently as the lecture progressed. By the end of the lecture, lapses occurred about every two minutes.

### **The Dual-Benefits of Active Learning**

The third—and possibly most intriguing—finding of this study was a relationship between the timing of active-learning, or “student-centered,” pedagogies and the pattern of reported lapses in attention. As previously described, the researchers carefully noted periods of transition from lecturing to incorporating active learning. The two most frequently employed active-learning methods were demonstrations and questions. All students in the class answered the questions using a clicker (study participants were therefore using two different clickers—one to answer the instructor’s questions and one to report attention lapses). The researchers found that there were fewer attention lapses reported during active-learning methods compared to those reported during lecture segments. They also found that there were fewer reported lapses in attention during lecture segments in the period immediately following either a demonstration or a question, when compared to lecture segments that preceded the active-learning methods. This finding hints at the possibility that active-learning methods may have dual benefits: engaging student attention during the segments when faculty use these methods and “refreshing” attention immediately afterward.

### **Study Limitations**

One note of caution on interpreting these results: Using clicker responses to measure attention in the classroom is a new approach, and while it may be an improvement over previous methods, it is not perfect. Of particular concern is the fact that students in this study were required to attend to and “self-report” lapses in their own attention. One could reasonably ask if students are best suited to judge their

own attention lapses, particularly if they are simultaneously taking notes and answering lecture-related clicker questions and—perhaps—engaging in activities unrelated to the class, such as texting, surfing the internet, or playing games on their phones or laptops.

### **Classroom Applications**

These study findings have several implications for university-level teaching. First, they support the notion that it is important to “break-up” lectures with periods of active learning, not only because of increased attention during such activities, but also because of the indirect boost in attention that can occur during lecture periods immediately following such activities.

Second, these findings should encourage instructors to reflect on their expectations regarding student attention in their classrooms. As you plan your teaching approaches, it is reasonable to expect brief lapses in student attention. In addition to incorporating active learning, you can use visual and verbal strategies to reinforce the most important information. For example, you might provide students with a “concept map” or outline to help them identify and organize key concepts in a lecture. You can also slow down and raise the volume of your voice when underscoring key points. Varying your teaching methods and maintaining an engaged teaching style over a 50 to 90 minute class session will help keep your students engaged and learning. For additional suggestions, see The Teaching Center’s handout, *Teaching with Lectures*.

If you would like to discuss the findings of this study, please contact [Carolyn Dufault](#), Assistant Director of The Teaching Center. If you are a faculty member who would like to discuss student attention in your own classroom or who is interested in developing ways to incorporate active learning, please contact [Gina Frey](#), Director of The Teaching Center.

### **References**

Bunce, D. M., Flens, E A., & Neiles, K. Y. (2010). How long can students pay attention in class? A study of student attention decline using clickers. *Journal of Chemical Education*, 87, 1438-1443.

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