# Orchestrated Attention During Classroom Learning

**Research in Process** 

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#### Abstract

Studies on attention span provide insight into why students struggle with the traditional lecture format. Considering that students typically maintain focus for about 15–20 minutes and university classes often last 50 or 75 minutes, educators need strategies to manage student attention effectively. We suggested a teaching strategy that aimed to manage students' attention in the lectures by incorporating brief breaks during the lecture. Those breaks reset the attention span. We prepared a questionnaire to test our new teaching method and determine the students' satisfaction with it. The aim was to evaluate the impact of those brief breaks on students' attention during the entire lecture and examine different effects of those brief breaks on the learning process.

Keywords: attention, brief breaks, lecture, teaching-learning process, factor affecting attention

### 1 Introduction

Attention is considered the gateway between information and the process of learning. It is a cognitive function that involves the selection of significant issues while disregarding those deemed less relevant or important. However, a significant gap remains in our understanding of how students focus within the classroom setting (Hartley & Davies, 1978; Keller et al., 2020).

The attention span represents the amount of time an individual can devote to a specific activity without succumbing to distractions. Given that students generally stay attentive for approximately 15–20 minutes and university classes tend to last 50 or 75 minutes, instructors must direct their students' focus effectively. One option is to integrate a "change-up" strategy within the class framework to refresh attention spans, especially if lecturing is the main instructional approach and students engage in passive listening (Hartley & Davies, 1978).

According to Hartley and Davis and others (Davis, 2009; Hartley & Davies, 1978;

McKeachie & Tips, 2006; Wankat, 2002) the average adult's attention span for a particular topic typically ranges from 10 to 20 minutes, with slight shifts in mental focus facilitating the renewal of attention for a brief period. Various factors, such as fatigue, hunger, and environmental noise, can reduce a person's attention span. Some studies raise doubts about the concept of a 10–15-minute attention limit for a particular topic (Bradbury, 2016; Wilson & Korn, 2007).

Middendorf and Kalish (1996) conducted a study to evaluate students' capacity to recall lecture content. The results indicated that most students could recall the initial content of a lecture, suggesting a heightened attentiveness at the beginning of class that wanes gradually. This underscores the importance of incorporating breaks or engaging in learning activities in lengthy classes to sustain students' attention and foster optimal concentration. Our research is based on this claim and focuses on how educators can manage and direct students' attention in the classroom setting.

## 2 Study description

#### 2.1 Research rationale

"Attention orchestration" during a lecture refers to the process of managing and directing students' attention for effective learning. The proposed pedagogy tries to orchestrate attention dynamics by a direct on–off approach with short pauses during a lecture. The pedagogy is based on attention loops 15–20 minutes long and includes the following steps:

- The lecturer writes the topic of the presentation on the board, along with the goals of the lecture.
- 2. The lecturer teaches the theory of the topic.
- 3. The lecturer gives examples of the topic.
- 4. The students can ask questions, and the lecturer gives related explanations and comments on the board.
- 5. The lecturer gives formal "brief breaks" of about a minute or two. Those breaks follow the following rules:
  - 5.1 The lecture is stopped.

5.2 Students are allowed to speak but not get out of their seats.

5.3 No questions are permitted.

The proposed pedagogy is designed to maximize the effectiveness of learning by breaking the lecture into manageable chunks, interspersed with questions and answers and brief breaks. This approach acknowledges the fact that attention spans can be limited and that providing regular breaks can help to maintain students' focus and engagement. The rules during the pause aim to give students a mental break while keeping order in the classroom. For flexibility, the lecturer can focus some loops solely on theory or examples, depending on the nature of the topic being taught.

#### 2.2 Study population

The research was carried out among undergraduate students enrolled in the Department of Electrical and Electronics Engineering at an engineering college. The study consisted of three groups of students: two groups from the Random Processes course and one from the Deep Learning course. The Random Processes course is a mandatory third-year course that comprises three-hour-a-week lectures and one-hour-a-week practical meetings. The proposed pedagogy was implemented only during lectures, and students encountered it for the first time. The Deep Learning course is an elective fourth-year course. Students enrolled in this course had already been exposed to this pedagogy during the Random Processes course in the previous year, with the same instructor. The number of students who participated in the questionnaire is summarized in Table 1.

Course	Time (hours)	Number of participants per questionnaire
Random Processes	09:00-12:00	27
Random Processes	16:00-19:00	11
Deep Learning		7

Table 1. Students'	participation.
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#### 2.3 Research tools and methods

The main research tool was a questionnaire. The questionnaire was distributed among the study population and was administered online on the Moodle course homepages. The questionnaire collected information about participants' opinions and demographics.

## **3** Preliminary results

The questionnaire was run on the 5th week of the semester. Questionnaire results, on a 1–5 Likert scale, are summarized in Table 2. The students were also asked about the recommended number of pauses and the length of each pause. The student can choose one to three answers from the available options. For the recommended number of pauses, the options were 0, 1, 2, 3, or 4. For the recommended length, the options were "no," "30 seconds," "1 minute," "1.5 minutes," or "2 minutes." The summary of the responses is presented in Figure 1 and Figure 2. The relationship between the answers is presented in Figure 3. The presented results show that the most recommended combination was two breaks of 1 minute each. The second favorite was three breaks of 1.5 minutes each. Most of the students recommended two or more breaks at least 1 minute long.

#	Question	Mean	SD
1	I find it difficult to concentrate during lectures	2.84	1.07
2	Talking in class creates difficulties for my learning process	4.09	1.26
3	I find it hard to avoid talking to other students during lectures	2.27	1.29
4	The course pauses help me to maintain concentration	4.27	0.78
5	It helps me maintain silence throughout the lecture (except for during the pauses)	3.91	1.08
6	During the lecture, pauses help others remain silent	4.11	0.78
7	By talking to friends during the pauses, I can avoid talking during lectures	3.93	1.07
8	After a lecture with breaks, I feel less tired	3.76	1.23
9	After a lecture pause, I have difficulty returning to concentration	1.69	1.06
10	Breaks in lectures enhance my learning	4.16	0.82

Table 2. The questionnaire



Figure 1. Student-recommended number of breaks.



Figure 2. Student-recommended length of breaks.



Figure 3. Relationship between student-recommended number of breaks and their lengths.

## 4 Summary and conclusions

Overall, the proposed pedagogical approach seems well-suited to maintaining student attention and promoting effective learning. Moreover, breaks in lectures enhance learning by allowing students to digest and process information more effectively. They also give students a chance to ask questions, clarify doubts, and exchange ideas with their peers. Breaks also allow students who are slow in copying to finish copying what the lecturer wrote on the board. Breaks also reduce stress and fatigue, leading to improved concentration and focus.

The effectiveness of the method seems to be advantageous for the teachers as well. However, this advantage needs further examination involving more teachers and additional research. In follow-up research, we would like to compare the students' preferences regarding the number and duration of breaks they need and their achievements in the course.

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