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RESEARCH ARTICLE

The design of a "1-minute break" to help with students' attention during lectures in a Pharm.D. programme

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Abstract

Background: The "*1-minute break*" is a novel educational approach that introduces intentional breaks through trivia questions to address students' challenges with paying attention during class time. **Methods:** After it was initiated and optimised, the "*1-minute break*" has been offered to students in different cohorts within the Pharm.D. pre-APPE programme for the past five years. Feedback on the utility of this innovative approach and its optimisation was gathered over the five years. Students also shared their perception of the impact of the "*1-minute break*" on their attention during classes using a survey with open-ended questions. **Results:** The "*1-minute break*" was highly accepted by all student cohorts. Students strongly favoured implementing this technique across the curriculum. Qualitative analysis of student feedback revealed that the "*1-minute-break*" helped them stay focused or regain attention in class. Student feedback provided similar comments before, during, and after the COVID-19 pandemic, reflecting that this technique can be implemented independently of the online and in-person teaching formats. **Conclusion:** The "*1-minute break*" technique, which uses intentional breaks by incorporating trivia questions during lectures, seems to help students stay focused or regain their attention during classes. This approach is easily implemented and apparently independent of the content taught.

Introduction

Over the past few decades, the pedagogical flip classroom approach has been implemented in many disciplines. However, in some areas, lecturing remains the most common educational approach (Islam *et al.,* 2016; Knoer *et al.,* 2016). In general, students find it challenging to maintain their attention for the length of the class period (Bradbury, 2016). Recent generations appear to have increasing difficulty keeping focused in class, indicating that the instructor should make more effort to enhance student attentiveness during lessons (Gage & Berliner, 1998).

Previous scholarly work indicated that it can be challenging to determine the actual length of students' attention span. Different factors that influence attention have been identified: 1) Student-related, such as motivation level and background knowledge of the topic; 2) Material-related, such as how appealing or new the material is; and 3) Intrinsic factors, such as class time and duration (Ames, 1990; Church *et al.,* 2001; Bunce *et al.,* 2010; Banas *et al.,* 2011). According to Sousa (2011), unmotivated students can pay attention only for 10-20 minutes in the classroom.

Although using breaks to help students stay attentive during class has been described in the literature (Miller *et al.,* 2013), this work depicts a new pedagogical approach termed the "*1-minute break*". This technique consists of inserting breaks of trivia questions strategically scheduled every 15 minutes of class time. This manuscript describes the evolution and

optimisation of the "*1-minute break*" and students' perception of the utility and value of this intervention.

Methods

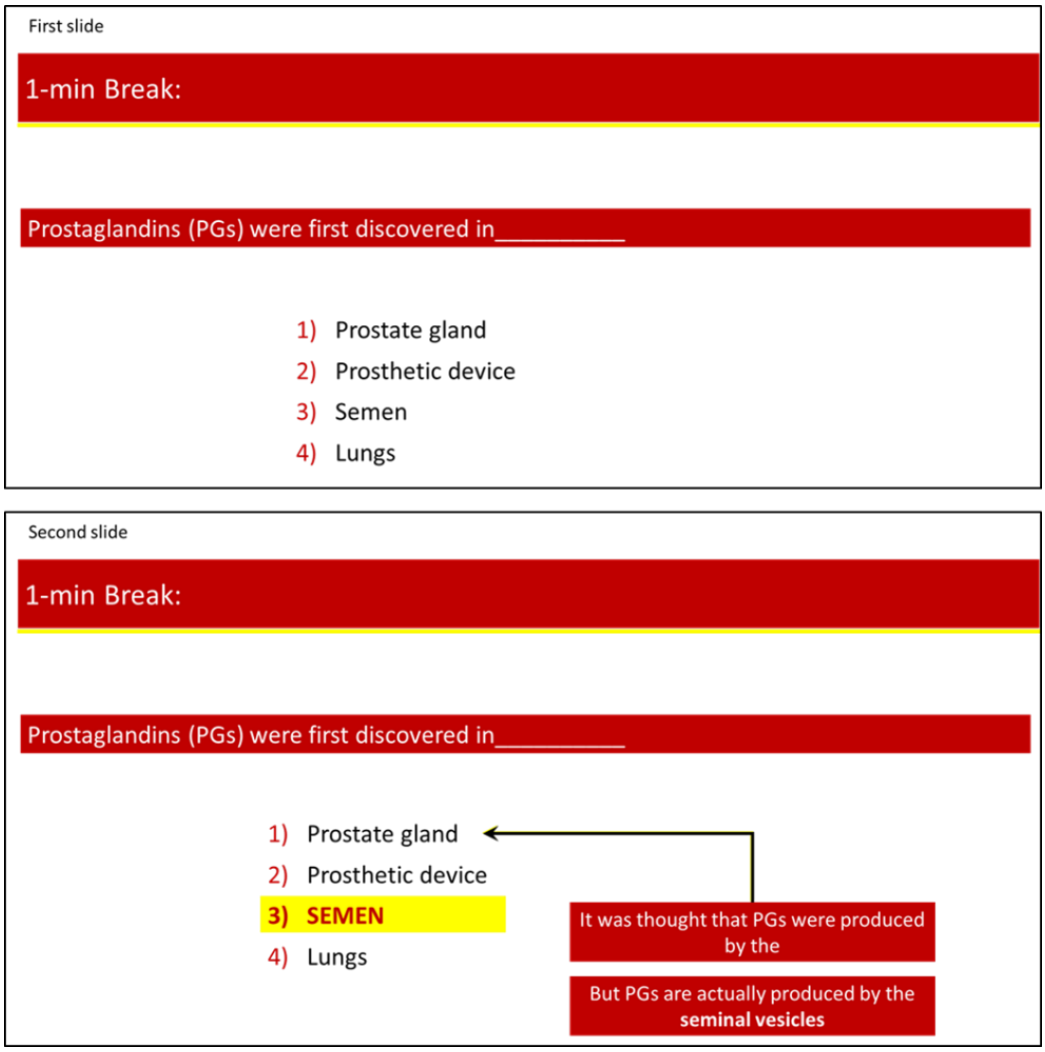
Description of the "1-minute break" educational intervention

The "*1-minute break*" was designed on PowerPoint (Microsoft) slides with distinctly different background colour from the rest of the lecture material. The different colour and the break time announcement slide were meant to help draw students' attention and indicate the beginning of the break time. The question heading appeared first, and then multiple answer choices appeared afterwards using slide animation. At each step, the instructor read aloud what appeared on the slide and encouraged student participation in a relaxed atmosphere. Finally, the correct answer choice was highlighted with another animation click, followed by a brief comment by the instructor. Students were given the chance to comment by sharing what they knew about the question topic.

The "*1-minute break*" slides were only available in the instructor's version of the PowerPoint handout to enhance the effect of capturing student attention and surprise. Regarding content, the "*1-minute break*" topics were meticulously selected to draw student attention and arouse their curiosity. Topics were either material-unrelated (Figure 1) or material-related (Figure 2).

The top slide appears first, where students are encouraged to participate and guess the answer. The second slide (bottom) appears afterwards.

Figure 1: An example of material-unrelated 1-minute break



The top slide appears first, where students are encouraged to participate and guess the answer. The second slide (bottom) appears afterwards. This example is used in an endocrinology class.

Figure 2: An example of material-related 1-minute break

Material-unrelated topics included humour, social studies, and influential figures, such as celebrities and politicians. Potentially controversial topics were carefully avoided. Since the "*1-minute break*" was not designed to test student knowledge in a particular field, there was no tracking of what was answered or which student participated. The sole purpose of this approach was to intentionally provide a break to the class session to help change the dynamic and tone of the class with an appealing topic in a safe and relaxing environment. The class sessions in the Pharm.D. programme are usually 110 minutes long, with a ten-minute break at the end of the first hour. The time each "*1-minute break*" took was roughly one minute, which was the reason behind naming it the "*1-minute break*". Hence, a total of four "*1-minute breaks*" would maximally take away up to four minutes from the class time of the 110-minute class.

During the pilot phase (2017-2018), the instructors experimented with different ways of delivering this educational approach, such as inserting the "*1-minute break*" at different intervals and adding an animation sound before each break to indicate the break time. Instructors then solicited verbal feedback about their experiences with the "*1-minute break*". Student feedback helped standardise how the "*1-minute break*" would be implemented. For example, the "*1-minute break*" appeared approximately every 15 minutes or similar time to have the break after each key objective/concept was taught before moving to the next topic in class. Also, the animation sound was removed after students stated it was too loud when replaying the lecture recording.

Figure 3 illustrates a summary of the design process.

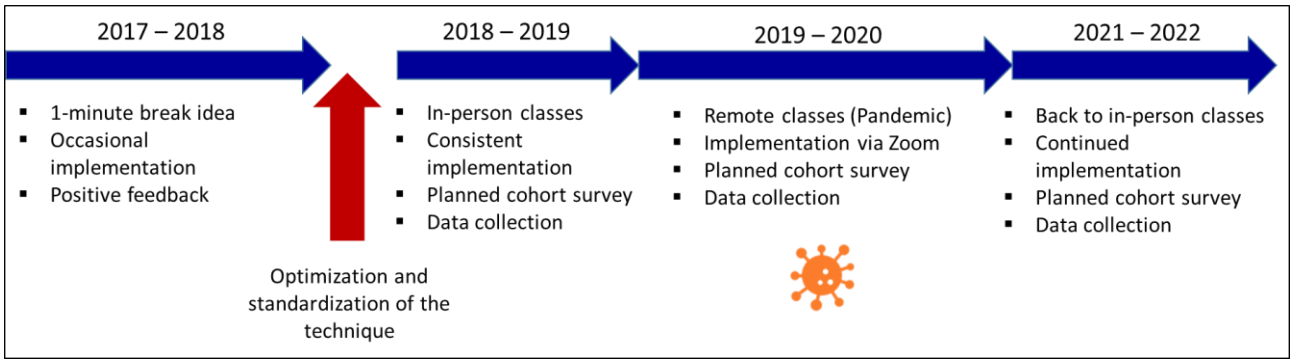


Figure 3: A timeline showing the progress of the 1-minute technique from conception in 2017-2018 to standardised implementation in 2018-2019, 2019-2020, and 2021-2022

During remote synchronous teaching due to the COVID-19 pandemic, the intervention was maintained, and discussion was facilitated live using ZOOM (Zoom Video Communication Inc.) sessions. When in-person classes were restablished, the "*1-minute break*" was brought back as before.

Assessment of the intervention

An anonymous and voluntary survey that included Likert-scale and open-ended questions was offered electronically to five different student cohorts of the Pharm.D. programme using a web-based portal made available by the authors' institution. Five cohorts were invited to participate across the academic years 2018-2019, 2019-2020, and 2021-2022. Surveyed students consistently had the "*1-minute break*" in the class blocks taught by the authors and were offered to participate in the survey at the end of each course. Although five student cohorts were surveyed, the "*1-minute break*" was implemented in courses taught by the authors in the P1, P2 and P3 years (this institution follows a 4-year Pharm.D. programme), e.g. Drug Delivery, Principles of Microbiology and Immunology, Biochemical Pharmacology, Pharmacogenomics, and the system-based therapeutic courses of Cardiology, Endocrinology, Autoimmune Diseases, and Infectious Diseases. These courses are team-taught, and other instructors involved in the same courses did not use the "*1-minute break*". The disciplines covered by the authors focused on pathophysiology, pharmacology, medicinal chemistry, pharmaceutics, and pharmacogenomics.

Data analysis

Statistical analysis comparing multiple cohort Likert-scale responses was performed using the Kruscal-Wallis test and Chi-Square (Prism 7.0, GraphPad Software Inc.). For the qualitative analysis, the investigators independently analysed the open-ended answers by searching for key themes and keywords using Microsoft Excel (Microsoft). Results were then compared, and percentages of these themes and keywords were calculated.

During the COVID-19 pandemic, instructors maintained using the "*1-minute break*", but the survey was not offered to reduce students' survey fatigue since students were asked for feedback on multiple occasions to ensure their learning during the remote teaching due to the pandemic. Instead, students were only asked if they found this tool helpful to stay engaged during class (not shown). The original survey was used again in the 2021-22 academic year.

Results

Student feedback on the "1-minute break"

A total of 350 students were surveyed across the five cohorts. Since students had the option to leave questions unanswered, the participation rate ranged between 77% and 86% (Table I).

The survey included a question related to attention in class to gain a baseline knowledge on how long students self-perceived their capability to pay attention during class. The results from 2018-2019 helped the instructors establish the optimal time to incorporate a break during the lecture. In the first cohort, 78% of students reported a self-perception of paying attention in class for 10-20 minutes (Table I). The same question was included in subsequent years to monitor if there was a change in the trend and adjust accordingly. Interestingly, student self-perception of maintaining class attention was consistent across all five cohorts (Table I), and no statistically significant difference in results was found. Further analysis compared changes pre- and post-pandemic, but no statistically significant differences were found. Overall, 71% of respondents

across all years perceived that they were capable of maintaining their attention for 10-20 minutes, with approximately 29% of them able to only pay attention for 10-15 minutes, 42% for 15-20 minutes, 8% for 5-10 minutes, and 7% for less than 5 minutes. Only 13% of students reported being able to pay attention for more than 20 minutes. The only significant difference was in the P1-2021-2022 cohort that asked for more frequent breaks ($p < 0.0001$, Chi-Square) in comparison with the rest of the answers across the years (Table I).

Table I: Summary of all student feedback on the "*1-minute break*"

	2018-2019 P2 N (%)	2018-2019 P3 N (%)	2019-2020 P2 N (%)	2021-2022 P1 N (%)	2021-2022 P2 N (%)	Total N (%)
Self-perception on attention during class						
Less than 5 min	2 (3)	8 (13)	2 (3)	3 (6)	5 (11)	20 (7)
5-10 min	4 (6)	4 (7)	7 (12)	4 (7)	5 (11)	24 (8)
10-15 min	24 (36)	17 (28)	17 (29)	14 (26)	11 (25)	83 (29)
15-20 min	28 (42)	27 (44)	20 (34)	26 (49)	19 (43)	120 (42)
More than 20 min	9 (13)	5 (8)	13 (22)	6 (11)	4 (9)	37 (13)
Total	**67**	**61**	**59**	**53**	**44**	**284**
Frequency of the break						
Every 10 min	8 (11)	13 (20)	12 (21)	29 (56)*	14 (32)	76 (26)
Every 15 min	44 (61)	38 (58)	36 (62)	16 (31)	23 (52)	157 (54)
Every 25 min	20 (28)	14 (22)	10 (17)	7 (13)	6 (14)	57 (20)
Total	**72**	**65**	**58**	**52**	**43**	**290**
Topic†						
Related to lecture topic	5 (7)	0 (0)	1 (2)	0 (0)	3 (6)	9 (3)
Unrelated to lecture topic	22 (32)	22 (35)	29 (49)	22 (42)	20 (46)	115 (40)
Combination of related and unrelated to lecture topic	41 (60)	40 (65)	29 (49)	30 (58)	21 (48)	161 (57)
Total	**68**	**62**	**59**	**52**	**44**	**285**
Non-related topics preferences						
Comic/humour	20 (31)	18 (32)	32 (27)	10 (19)	7(16)	87 (26)
US history/geography	8 (13)	11 (19)	17 (14)	12 (23)	5 (11)	53 (16)
Science fiction	6 (9)	6 (10)	16 (13)	6 (11)	3 (7)	37 (11)
International history/geography	8 (13)	9 (16)	20 (17)	9 (17)	4 (9)	50 (15)
Celebrities	11 (17)	9 (16)	16 (13)	13 (25)	18 (41)	67 (20)
Others	11 (17)	4 (7)	18 (15)	2 (4)	7 (16)	42 (12)
Total	**44**	**57**	**103**	**52**	**44**	**300**
Qualitative feedback key words‡						
Attention	23 (43)	25 (44)	22 (41)	23 (44)	12 (27)	105 (27)
Focus/gain focus	37 (69)	34 (60)	30 (55)	40 (77)	16 (36)	157 (41)
Helpful	29 (54)	23 (40)	21 (40)	28 (54)	24 (55)	125 (32)
Total	**89**	**82**	**73**	**91**	**52**	**387**

*$p < 0.001$ compared with the rest of the cohorts (Chi-Square test); † Topic options were selected all that apply, that justify higher totals for that answer;
‡ Students may have included one or more of these words in their responses

Further responses helped instructors identify, optimise, and maintain best practices for this technique. When specifically asked about the frequency of the "*1-minute break*" within each class block, 54% of students preferred to have the break every 15 minutes in the regular 50-minute class time, compared with every 10 minutes and 25 minutes (26% and 20%, respectively). Therefore, the "*1-minute break*" was implemented initially every 15 minutes and kept as such for the rest of the cohorts (Table I).

Regarding trivia questions, 40% of students chose content unrelated to course material, while 57%

preferred a combination of course-related and non-course-related material, with only 3% selecting course-related topics exclusively (Table I). Those who chose topics non-related to course material preferred various themes, the two most cited across the years being comics/humour (26%) and celebrities (20%) (Table I).

When asked if they felt the "*1-minute break*" should be adopted by other instructors and used in other courses, 98% of students across the five cohorts recommended having this approach in other disciplines (data not shown in the table).

Qualitative analysis on the impact of the "1-minute break" on students' attention

An open-ended question was used to assess student perception of the impact of the "*1-minute break*" on their attention during lectures. Qualitative analysis revealed that students perceived the "*1-minute break*" activity as "*helpful*" in bringing their attention back. The most common themes and keywords students used in their feedback were "*attention", "focus"*, and "*help*/*helpful"*. These terms were used 387 times by the 271 students who filled out the open-ended question to give feedback on the "*1-minute break*" experience. Most students (98%) described a positive impact of the 1-minute break on their attention/focus. Those who reported not finding it helpful (1%) mentioned the need for some time to refocus on the class block material after the "*1-minute break*", while the remaining 1% were unsure of their perception of its usefulness (not shown).

Representative answers of feedback from students who favoured the "*1-minute break*":

> *"Honestly it's a good way to bring attention back, it causes a great refocus when many are starting to drift off from the presentation." (P2 2018-2019);*
>
> *"they shifted my attention to something more interactive and in a sense recharged my brain" (P3 2018-2019);*
>
> *"It greatly helps improve my focus and attention. It allows my brain to take a 'rest' and then resume focusing on needed material" (P2 2019-2020);*
>
> *"I think having the 1 minute breaks improves my ability to pay attention to the lecture material. They are interesting, fun, and draw my attention to the speaker when i am almost ready to tune out" (P1 2021-2022);*
>
> *"They have been really helpful in keeping my brain alert. I have ADHD and these small breaks have been key to keeping me focused throughout the entire class session without zoning out" (P2 2021-2022).*

Discussion

Pedagogical approaches aim to benefit students and provide solid education (Saroyan & Snell, 1997). A plethora of factors are involved in determining the effectiveness of any educational process, such as the style of lecturing, the topic of the session and discipline(s), the level of motivation students have, the classroom environment, and personal and social factors that students could be experiencing at that particular time (Sousa, 2011)

Evidence confirms that lectures, when done correctly, can be an effective method of teaching and can transmit knowledge efficiently, explain challenging concepts, and stimulate enthusiasm and motivation (Gage & Berliner, 1998). A lecture has to be interactive between the instructor and students and foster discussion between students to be effective (Steinert & Snell, 1999). Factors that could contribute to how students interact in the classroom are similar to those listed previously, including, among others, the topic and student involvement (Gage & Berliner, 1998). Student involvement is essential to the effectual education process and depends highly on student attention and motivation (Steinert & Snell, 1999). Educational studies have confirmed that the memory of students can be enhanced by improving their attention and motivation (Gage & Berliner, 1998), which would contribute to the long-term knowledge retention required for further critical thinking and decision-making (Steinert & Snell, 1999).

Most instructors aim to be able to keep their students engaged and attentive for much of their class time. However, maintaining attention during class time and decreasing mind-wandering seem challenging to most students (Saroyan & Snell, 1997; Church *et al.,* 2001; Banas *et al.,* 2011).

Although the pedagogical community does not have a definite, research-supported answer to exactly how long students can stay attentive during class time, it is known that students, for the most part, find it extremely difficult to maintain their attention for the majority of the length of a class time (Sousa, 2011). Contrary to common belief, students cannot stay attentive for longer than 10-15 minutes (Bunce et al., 2010). Moreover, some studies on attention span suggest that students' attention considerably dwindles after 20 minutes in the traditional lecture setting (Steinert & Snell, 1999) and that later generations need more effort by the instructor to enhance their attentiveness during class (Gage & Berliner, 1998). A group of researchers found that students alternate between periods of engagement and disengagement (Bunce et al., 2010); thus, increasing efforts to engage

students in the classroom could enhance their performance (Miller *et al.,* 2013).

Therefore, the pedagogical community has developed a multitude of active learning techniques, such as changing pace and adding activities that enhance their interest, including real-life applications, to be used during interactive lectures to improve student engagement in their classes (Steinert & Snell, 1999; Miller *et al.,* 2013).

Of the many available techniques, changing pace through intentional breaks was more appealing to the authors. The concept of the "*1-minute break*" evolved over a few terms. At first, it was a simple way of breaking up the monotony of the lecture and allowing students to take a short pause from the challenging material presented to them. The breaks were also random, and their names were not consistent, sometimes called "*Trivia Questions*" and others "*Break Time*".

Interestingly, when surveying students regarding their self-perception of attention time, the majority selected 10-20 min, which coincided with the frequency of those who found the "*1-minute break*" to be more helpful in refreshing their attention. Constant positive feedback from students about these mini breaks was crucial to optimising and standardising this technique. By spring 2019, the authors decided to apply this technique to all Pharm.D. courses they taught and designed a survey to be offered at the end of some courses. Since then, it has been known as the "*1-minute break*"; it appeared in the same format, font, and colour and was timed to occur in 15-minute intervals. The surveyed Pharm.D. student cohorts were from different years in the programme (P1, P2, and P3 students).

The most striking features of this interactive tool were its simplicity, versatility, low cost, and acceptance. After the COVID-19 pandemic started, the model was adapted for a hybrid teaching format. The high acceptance rate is based on the observation that all surveyed students expressed their desire to have the same tool applied to all their classes.

The observation that student feedback did not change based on the teaching format, in-class *vs*. remote, supports the versatility and applicability of this technique in enhancing student attention in the classroom. Also, the lack of statistically significant differences between cohorts and courses implemented further corroborates the potential usefulness of this educational approach for different student classes in the programme and additional courses or topics.

The "*1-minute break*" is simple as a concept, but the experience has shown that it is often more time-demanding and effort-requiring than it sounds. This task could be challenging, as time is limited (about 1 minute), and the topics for the trivia questions need to be attractive to students while avoiding controversial themes. One has to keep in mind the generational gap between students and instructors, hence the reason for avoiding potentially controversial topics. Moreover, course-related topics were included whenever possible to support the material or give a new perspective on the content. This approach was supported by more students who preferred a combination of material-related and material-unrelated topics. Also, trivia questions included riddles to bring humour to enhance student well-being, an idea supported by students' preference for the humour category. This observation also corroborates previous scholarly works about the positive impact of introducing humour in the classroom (Ames, 1990; Miller *et al.,* 2013). The time invested in the "*1-minute break*" seemed worth the few minutes it would take in the typical 110-minute class. There was no indication that the lecture material was compromised by the time used for these breaks.

Strengths and limitations

Although one of the strengths of this study was that it was conducted across different student cohorts and course levels, this study was limited to one institution, which limits the generalisability of the findings. Further studies are needed to evaluate the impact of a "*1-minute break*" on student knowledge retention of the material covered before and after each break to assess whether learning is also improved.

Conclusion

This work describes a brief, low-cost, seemingly efficient educational intervention to help students stay focused or regain attention in a classroom setting. The "*1-minute break*" is a short pause that occurs in a unique format every 15 minutes during class time and presents trivia information (related and unrelated to lecture topics) to students in a relaxed environment. The intervention was implemented in 2018-2019, and five Pharm.D. cohorts from P1, P2, and P3 classes were surveyed from 2018-2019 to 2021-2022 academic years. Most students found the "*1-minute break*" helpful and recommended having the same technique in other courses. This approach can be easily implemented by other faculty at no cost. No subscription to any response audience application is required since the intention is not to see which students got it correct but to intentionally disrupt the class to regain attention.

Conflict of interest

The authors have no conflicts of interest to disclose.

Ethics approval

This work has been approved the institutional review board of West Virginia University School of Pharmacy and was considered to be exempt.

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References

Ames, C. (1990). Motivation: What teachers need to know. *Teachers College Record,* **91**(3), 409–421. https://doi.org/10.1177/016146819009100306

Banas, J. A., Dunbar, N., Rodriguez, D., & Liu, S. J. (2011). A review of humor in educational settings: Four decades of research. *Communication Education,* **60**(1), 115–144. https://doi.org/10.1080/03634523.2010.496867

Bradbury, N. A. (2016). Attention span during lectures: 8 seconds, 10 minutes, or more? *Advances in Physiology Education,* **40**(4), 509–513. https://doi.org/10.1152/advan.00109.2016

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**(12), 1438–1443. https://doi.org/10.1021/ed100409p

Church, M. A., Elliot, A. J., & Gable, S. L. (2001). Perceptions of classroom environment, achievement goals, and achievement outcomes. *Journal of Educational Psychology,* **93**(1), 43–54. https://doi.org/10.1037/0022-0663.93.1.43

Gage, N. L. C., & Berliner, D. C. (1998). *Educational psychology.* (6th ed.). Wadsworth Publishing.

Islam, M. A., Khan, S. A., & Talukder, R. M. (2016). Status of physiology education in US Doctor of Pharmacy programs. *Advances in Physiology Education,* **40**(4), 501–508. https://doi.org/10.1152/ADVAN.00073.2016

Knoer, S. J., Eck, A. R., & Lucas, A. J. (2016). A review of American pharmacy: Education, training, technology, and practice. *Journal of Pharmaceutical Health Care and Sciences,* **2**, 32. https://doi.org/10.1186/s40780-016-0066-3

Miller, C. J., McNear, J., & Metz, M. J. (2013). A comparison of traditional and engaging lecture methods in a large, professional-level course. *Advances in Physiology Education,* **37**(4), 347–355. https://doi.org/10.1152/advan.00050.2013

Saroyan, A., & Snell, L.S. (1997). Variations in lecturing styles. *Higher Education,* **33**(1), 85–104. https://doi.org/10.1023/A:1002992423519

Sousa, D. A. (2011). *How the brain learns.* (4th ed.). Thousand Oaks: Corwin Press.

Steinert, Y., & Snell, L. S. (1999). Interactive lecturing: Strategies for increasing participation in large group presentations. *Medical Teacher,* **21**(1), 37-42. https://doi.org/10.1080/01421599980011