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Do ‘brain breaks’ help students learn?

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Statement of the problem

It is essential for attention to be maintained for learning to happen effectively. In a classroom situation, there are several internal and external factors that can lead to inattention and a loss of focus. Orienting attention to a specific input or task (concentrating) requires conscious effort. This draws on executive functions that are still developing in children and they therefore can have difficulty attending to lessons for long periods of time.

Proposed solution

Punctuating learning with ‘brain breaks’, typically either a physical or mindfulness/meditation activity for 1 to 5 minutes, is a popular tactic among teachers to reset and refocus students’ attention to the learning task. This allows them to briefly shift focus to a less cognitively demanding activity.

The theoretical rationale – how does it work?

It is hypothesised that a brief shift in focus will allow the brain to reach a state of low cognitive load that will let the information being held in working memory begin its transfer to long term memory, before returning to a learning activity. For young children who are unused to sitting still and paying attention, or for children with attention and/or hyperactivity disorders, brain breaks are seen as a way to release energy and then re-engage with learning.

What does the research say? What is the evidence for its efficacy?

Several studies have examined the effects of active breaks on academic achievement and cognitive functions involving primary school children of a range of ages.

A study by Mavildi et al. (2019) with Australian students in Years 3 and 4 found that active breaks resulted in significant improvements in engagement and significant effects for mathematics performance (d = 0.4, p = 0.045). Mazzoli et al. (2019) studied the relationship between time spent sitting, stepping and sit-to-stand movement with cognitive functions and brain activity in younger Australian students. They concluded that students who spent longer sitting were more easily distracted, but the results for cognition measures were inconclusive. Müller et al. (2021) studied active breaks for Year 4 and 5 students and reported a significant positive effect on attention but not reading comprehension. The reverse was reported for mindfulness breaks, with small positive effects on reading comprehension but no effect on attention.

A systematic review by Watson et al. (2017) included four studies of academic outcomes and found only one significant effect for maths. A meta-analysis by de Greeff et al. (2018) found that active breaks had a positive small to moderate effect on attention (d = 0.43) and mixed but weak results for reading (d = 0.17) and maths (d = -0.18). Likewise, Daly-Smith et al. (2018) described active breaks as resulting in no change in cognitive outcomes and weak effects on academic performance. Masini et al.’s (2020) systematic review described the results of studies of active breaks on cognitive functions as inconclusive and determined that active breaks have “limited or no impact on academic achievement”.

Conclusion

Overall, evidence for the effect of active classroom breaks on cognitive and executive functions such as attention/active engagement is moderately positive, but this does not necessarily translate into learning. There is mixed but weak evidence of the effect of active breaks and mindfulness breaks on academic achievement. This may be due to the quality of the studies, or differences in the type, frequency and duration of the breaks; however, based on the current research, there is insufficient evidence to support the benefits of ‘brain breaks’ for learning.

Key references

Daly-Smith, A. J., Zwolinsky, S., McKenna, J., Tomporowski, P. D., Defeyter, M. A., & Manley, A. (2018). Systematic review of acute physically active learning and classroom movement breaks on children’s physical activity, cognition, academic performance and classroom behaviour: understanding critical design features. B*MJ Open Sport & Exercise Medicine, 4*(1). https://doi.org/10.1136/bmjsem-2018-000341

de Greeff, J. W., Bosker, R. J., Oosterlaan, J., Visscher, C., & Hartman, E. (2018). Effects of physical activity on executive functions, attention and academic performance in preadolescent children: a meta-analysis. *Journal of Science and Medicine in Sport, 21*(5), 501–507. https://doi.org/10.1016/j.jsams.2017.09.595

Masini, A., Marini, S., Gori, D., Leoni, E., Rochira, A., & Dallolio, L. (2020). Evaluation of school-based interventions of active breaks in primary schools: A systematic review and meta-analysis. *Journal of Science and Medicine in Sport, 23*(4), 377–384. https://doi.org/10.1016/j.jsams.2019.10.008

Watson, A., Timperio, A., Brown, H., Best, K., & Hesketh, K. D. (2017). Effect of classroom-based physical activity interventions on academic and physical activity outcomes: a systematic review and meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity, 14*(1). https://doi.org/10.1186/s12966-017-0569-9