



Impact of a Six-Month Active Brain Breaks Programme on Attention Performance Among Elementary School Children

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ABSTRACT

The purpose of this pre-experimental research was to investigate the impact of a Six-Month Active Brain Breaks Programme (ABBP) on the Attention Performance of Elementary School Children aged between 9–11 years. For this purpose, 30 children studying at PICT Model School, Pune, participated in the research study. The Active Brain Breaks Programme consisted of 2–3-minute structured physical activity sessions conducted after every two academic periods, five days a week, for six months. The participants were selected using a non-probability convenience sampling technique. The d2 Test of Attention (Paper-Pencil Test) developed by Rolf Brickenkamp (1981) was used to assess the attention performance of the participants before and after the intervention. Concentration Performance (CP) scores obtained from the d2 Test were analysed using a paired samples t-test. The descriptive statistics revealed an increase in the mean Concentration Performance score from 98.47 (39.31) during the pre-test to 109.23 (40.79) during the post-test. Inferential statistics using a paired samples t-test revealed a statistically significant improvement in attention performance ($t = -9.124$, $p < .001$). The intervention also demonstrated a very large practical effect (Cohen's $d = 1.67$). It was concluded that the Six-Month Active Brain Breaks Programme had a significant positive impact on the attention performance of elementary school children.

Keywords : Active Brain Breaks Programme, Attention Performance, Concentration Performance, d2 Test of Attention, Elementary School Children.



Introduction

Attention constitutes a foundational cognitive process that underpins children's capacity to engage with learning tasks, follow instructions, and sustain participation in classroom activities. As a key executive function, attention is consistently associated with academic achievement, classroom behaviour, and effective learning (Hillman et al., 2008). Physical activity is widely recognised as an important modifiable factor supporting cognitive functioning in school-aged children. Empirical evidence indicates that habitual engagement in physical activity positively influences attention, concentration, and academic performance among children (Donnelly et al., 2016; Liu et al., 2020).

In response to this evidence, schools have increasingly sought to integrate movement into the academic day. One such strategy is the Active Brain Breaks Programme, which comprises short bouts of structured physical activity conducted during school hours to provide movement opportunities and may help children return to academic tasks with renewed focus and engagement. Classroom-based physical activity programmes have been reported to improve on-task behaviour and classroom engagement among children (Howie et al., 2014; Infantes-Paniagua et al., 2021; Schmidt et al., 2016). The importance of physical activity for children's holistic development is reinforced by the World Health Organization, which recommends an average of at least 60 minutes of moderate-to-vigorous-intensity physical activity daily to support physical, mental, and cognitive health (Chaput et al., 2020).

The present study is a continuation of an earlier pilot exploratory study conducted by the researcher, which examined the feasibility and preliminary effects of the Active Brain Breaks Programme among elementary school children over a three-week intervention period (Jagdale & Shendkar, 2025). Although the pilot study demonstrated the feasibility of implementing the programme, previous research suggests that longer intervention periods are more likely to produce meaningful and sustained improvements in attention (Egger et al., 2019; Ferrara et al., 2025). Therefore, the programme was extended to a six-month intervention period. Therefore, the programme was extended to a six-month intervention period. The present study therefore aims to examine the impact of a six-month Active Brain Breaks Programme on attention performance among elementary school children and to contribute empirical evidence regarding the role of long-term school-based physical activity interventions in supporting children's attention and learning.



Material and Methods

Variables

The Active Brain Breaks Programme served as the independent variable. Attention constituted the dependent variable, operationalised through scores derived from the d2 Test of Attention.

Research Design

The present study adopted a pre-experimental one-group pre-test–post-test design to examine the impact of a six-month Active Brain Breaks Programme on attention performance among elementary school children. Participants were assessed using the d2 Test of Attention before the commencement of the intervention and after the completion of the six-month programme. The pre-test and post-test scores were used to determine changes in attention performance following the intervention.

Sampling

The target population for this study comprised elementary school children aged 9 to 11 years enrolled at PICT Model School, Pune. A sample of 30 participants ($N = 30$) was selected using a non-probability convenience sampling technique. This sampling technique was adopted due to the accessibility of participants, alignment with the school's academic schedule, and the willingness of learners to participate in the study.

Procedure

Phase One — Programme Development.

Following a comprehensive review of the relevant literature, the researcher developed the Active Brain Breaks Programme (ABBP) comprising short, structured movement-based activities that could be easily implemented within the classroom without the need for specialised equipment.

Phase Two — Intervention and Assessment.

The attention performance of the participants was assessed at baseline using the d2 Test of Attention. Following the pre-test assessment, the participants underwent the Active Brain Breaks Programme for a period of six months. The programme consisted of 2–3-minute Active Brain Breaks conducted after every two academic periods, five days a week, as part of the regular school schedule. Upon completion of the six-month intervention, the d2 Test of Attention was re-administered to assess changes in attention performance.



Ethical Considerations

Institutional permission was obtained from the school administration. Written informed consent was secured from parents/guardians, and verbal assent was obtained from participants. Participation was voluntary, with the option to withdraw at any stage.

Results

This study examined the impact of a six-month Active Brain Breaks Programme on the attention performance of elementary school children. A paired samples t-test was performed to compare the participants' pre-test and post-test Concentration Performance (CP) scores obtained from the d2 Test of Attention. Concentration Performance (CP) was considered the primary outcome measure, as it reflects learners' attention performance by combining processing speed and accuracy. The results of the analysis are presented below.

Table 1 : Descriptive Statistics of Pre-test and Post-test Concentration Performance (CP) Scores

Assessment	N	Mean	Standard Deviation	Standard Error Mean
Pre-test	30	98.47	39.31	7.18
Post-test	30	109.23	40.79	7.45

Table 1 presents the descriptive statistics of the concentration performance (CP) scores of the participants before and after the six-month Active Brain Breaks Programme. The mean CP score increased from 98.47 (SD = 39.31) during the pre-test to 109.23 (SD = 40.79) during the post-test, indicating an improvement in learners' concentration performance following the intervention. The increase in the mean score suggests that regular participation in the Active Brain Breaks Programme may have positively influenced learners' ability to sustain attention and concentrate during cognitive tasks. However, the statistical significance of this observed improvement is examined in the paired samples t-test presented in Table 2.



Table 2 : Paired Samples *t*-Test Analysis of Pre-test and Post-test Concentration Performance (CP) Scores

Variable	Mean Difference	95% Confidence Interval	t	df	Sig. (2-tailed)	p	Cohen's d
Pre-test CP – Post-test CP	-10.77	-13.18 to -8.35	-9.124	29	0.000	< .001	1.67

*Significant at 0.05 level of significance

Table 2 presents the results of the paired samples *t*-test conducted to determine the effect of the six-month Active Brain Breaks Programme on the attention performance, as measured by the Concentration Performance (CP) score of the d2 Test of Attention. The analysis revealed a statistically significant difference between the pre-test and post-test CP scores ($t(29) = -9.124$, $p < .001$). The mean difference of -10.77 indicates that the post-test concentration performance scores were significantly higher than the pre-test scores following the intervention. The 95% confidence interval (-13.18 to -8.35) did not include zero, further confirming the statistical significance of the improvement. Furthermore, the effect size was very large (Cohen's $d = 1.67$), indicating that the six-month Active Brain Breaks Programme had a substantial practical impact on learners' attention performance. These findings demonstrate that regular participation in structured Active Brain Breaks significantly enhanced the attention and concentration performance of elementary school children.

The present study also extends the findings of the researcher's earlier pilot exploratory study (Jagdale & Shendkar, 2025), which primarily examined the feasibility of implementing the Active Brain Breaks Programme over a three-week period. Although the pilot study successfully established the practicality of the intervention, it did not demonstrate substantial improvements in attention performance. The findings of the present study indicate that extending the intervention to six months resulted in significant improvements in attention performance, highlighting the importance of sustained implementation for achieving measurable cognitive benefits.

Discussion

The findings of the present study indicate that the six-month Active Brain Breaks Programme significantly improved the attention performance of elementary school children. The improvement in Concentration Performance (CP) suggests that regular



participation in short, structured physical activities during the school day may enhance learners' ability to maintain attention and concentration. Although the present study did not examine the physiological mechanisms directly, the observed improvement may be attributed to the positive effects of regular physical activity on learners' alertness and classroom focus. These findings are consistent with earlier studies, which reported that classroom-based physical activity positively influences attention and cognitive performance among school children (Mahar et al., 2006; Watson et al., 2017).

The present findings also extend the results of the researcher's earlier pilot exploratory study (Jagdale & Shendkar, 2025), which established the feasibility of implementing the Active Brain Breaks Programme but did not observe substantial improvements in attention performance during the short intervention period. In contrast, the six-month intervention produced significant improvements in learners' concentration performance, suggesting that sustained implementation is important for achieving measurable cognitive benefits. The findings indicate that Active Brain Breaks can be implemented successfully in the school setting with minimal time and resources while supporting learners' attention performance.

Conclusion

The present study concluded that the six-month Active Brain Breaks Programme had a significant positive impact on the attention performance of elementary school children. The findings revealed a statistically significant improvement in Concentration Performance (CP) scores from pre-test to post-test, indicating that regular participation in structured classroom-based movement activities enhanced learners' ability to maintain attention and concentration during cognitive tasks. The large effect size further demonstrated that the intervention produced a meaningful practical impact on learners' cognitive performance. These findings suggest that short, structured Active Brain Breaks, when implemented consistently over an extended period, can serve as an effective strategy for promoting attention performance in the school setting. The study also highlights the importance of sustained implementation, as the earlier three-week pilot intervention established the feasibility of the programme, whereas the present six-month intervention demonstrated measurable improvements in attention performance. Therefore, integrating Active Brain Breaks into the regular school timetable may contribute to improving learners' attention and creating a more effective learning environment.



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