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THE IMPACT OF BRAIN BREAKS IN EDUCATIONAL SETTINGS: A SCOPING REVIEW

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Abstract : Brain breaks—short, purposeful physical or cognitive activities integrated within classroom lessons—have gained global attention as an effective strategy to enhance student learning, attention, engagement, and well-being. This review synthesizes findings from recent international studies, including a large number of papers published in 2025 (one-one paper from 2024 and 2023) from which only representative studies were selected for analysis. In contrast, Indian research on brain breaks remains limited, with comparatively few studies available, reflecting a significant gap in national research. International evidence consistently demonstrates improvements in attention span, on-task behavior, cognitive processing, physical activity levels, and psychological well-being. Meanwhile, the scarcity of Indian studies highlights the need to expand research in this area. This review underscores the potential of brain breaks as a simple yet free and powerful tool for improving learning environments and provides guidance for educators, policymakers, and researchers seeking to integrate evidence-based practices into classroom instruction.

Keywords: Brain breaks; Active breaks; Classroom physical activity; Attention and engagement; Student well-being; Educational settings; Scoping review

Introduction: Modern classrooms face challenges such as declining attention spans, reduced engagement, and increased sedentary behaviour. Brain breaks—brief and purposeful activity pauses during lessons—offer an effective means to refresh students' cognitive and physical readiness for learning. These breaks typically involve stretching, movement, mindfulness, music, or short cognitive tasks.

International research demonstrates that brain breaks improve on-task behaviour, attention, cognitive flexibility, learning readiness, physical activity levels, and psychological well-being. However, Indian research is comparatively limited, with only a few studies exploring these benefits. This indicates a clear gap and the need for evidence relevant to the Indian educational setting. The present review syntheses both International and Indian studies to understand their effectiveness and to identify gaps for future research.

Research Questions: The present review is structured around the research questions listed below:

1. What is the overall effectiveness of brain breaks in improving student learning outcomes?
2. How do brain breaks influence attention span, engagement, and on-task behavior among school students?
3. Which types of brain breaks (physical, mindfulness, movement-based, music-based) are most commonly used?
4. Which age groups (primary, secondary, higher education) are most studied, and where do research gaps exist?

Objectives of the Review:

1. To evaluate the effectiveness of brain breaks in enhancing learning outcomes.
2. To examine their influence on students' attention, engagement, and on-task behaviour.
3. To identify commonly used types of brain breaks—physical, mindfulness-based, movement-based, and music-based.
4. To map the distribution of studies across age groups and highlight research gaps.

Methodology (Review Method): This scoping review includes research from International and Indian studies sourced from Google Scholar, ERIC, PubMed, ResearchGate, Shodhganga, and Scopus. Search terms included "Brain Breaks," "Classroom Activity Breaks," "Movement Breaks," "Active Breaks," "Mindfulness Breaks." Studies included empirical research, experimental designs, observational studies, and intervention-based studies.

Review of International Studies:

- ✓ **Petrelli et al. (2025)** in Enhancing Attention and Executive Functions Through Physical Activity Breaks, examined whether outdoor and exergame-based breaks improve cognitive performance in university students. Using a randomized crossover design with 17 students, the study implemented three conditions: no break, outdoor break, and exergame break. Cognitive tools included the Trail Making Test and Stroop Test, administered after 10-minute sessions. Results showed significant gains in processing speed, divided attention, and inhibitory control with both activity breaks. Exergames improved complex attention more, while outdoor breaks enhanced accuracy. The study concluded that short, structured activity breaks effectively enhance cognitive readiness in higher education.
- ✓ **Murodova et al. (2025)** in Energizer Activities in the Educational Process, aimed to conceptualize energizer activities and their benefits. Using a descriptive theoretical method, the authors reviewed various energizer types—physical, mental, creative, and social. Data were derived from conceptual and literature analyses. Findings emphasized improved motivation, engagement, and participation when energizers are used. The study concluded that energizers act as effective brain-break strategies to refresh attention and enhance learner enthusiasm.
- ✓ **Misnawati et al. (2025)** in Visual Warm-Ups in the Classroom, evaluated how video-based warm-up activities influence student motivation. A mixed-methods design was used with 65 undergraduate students, combining surveys and reflection sheets. Data indicated increased motivation, better lesson readiness, and improved comprehension. The study concluded that video warm-ups serve as effective cognitive brain breaks promoting engagement.
- ✓ **Iskandar et al. (2025)** in Effective Classroom Management, reviewed 120 studies to identify strategies reducing classroom disruptions. The methodology was a mixed-method systematic review using thematic analysis. Findings showed proactive classroom strategies reduce disruptive behavior by up to 65%. The study concluded that structured activity breaks and proactive techniques improve behavioural regulation and classroom flow.
- ✓ **Pardali et al. (2025)** in Pupils' Participation Roles in Physical Activity, sought to examine how students perceive their involvement in school activity programs. Using qualitative focus groups in Norway and Estonia, data were collected via semi-structured interviews. Students described roles such as helping, informing, and taking responsibility. The study concluded that active participation enhances motivation and ownership in school activities.
- ✓ **Piccinini et al. (2025)** in PauseNørd Pilot Study, investigated short (<1-minute) movement breaks in higher education. Using a mixed-methods feasibility design with observations and surveys, students reported improved alertness, mood, and focus. Implementation data showed high acceptability in classrooms. The study concluded that even extremely short movement breaks positively impact attention and well-being.
- ✓ **Bellacicco et al. (2024)** in Active Breaks and Curriculum-Based Active Breaks, conducted a systematic review of 19 studies on physically active lessons. Data extraction followed PRISMA guidelines. Findings showed improvements in executive functions, math performance, and reduced anxiety in primary students. The review concluded that active breaks promote cognitive and academic benefits across school settings.
- ✓ **De Franches & Gulbay (2025)** in Improving Student Wellbeing and Learning Through Serious Games and Active Breaks, reviewed literature on gamified learning and movement breaks. Using narrative review methodology, data were synthesized from prior studies. Findings showed increased engagement, enjoyment, and well-being. The authors concluded that combining active breaks with educational games enhances holistic learning.
- ✓ **Jacobson (2025)** in Strategies for Reducing Violent Behavior in the Classroom, explored mindfulness-based brain breaks for kindergarten children. Using qualitative daily reflections and teacher observations, data showed improved emotional regulation and reduced aggressive behaviour. The study concluded that mindfulness breaks help young children manage emotions effectively.
- ✓ **Mohamed et al. (2025)** in Stop, Stretch and Think, investigated brain breaks in university-level EFL classrooms. Using quantitative surveys with tertiary students, data showed improved attention, participation, and academic performance. The study concluded that structured stretching breaks support cognitive readiness and language learning.
- ✓ **Feeney et al. (2025)** in Social and Emotional Swiss Cheese, developed a conceptual SEL framework integrating brain breaks. Drawing from literature analysis, the study highlighted improvements in emotional regulation, engagement, and classroom climate. The authors concluded that SEL-based breaks promote well-being and academic balance.
- ✓ **Chilekezi (2025)** in Exploring the Nature of Pedagogical Distraction, used an interpretative phenomenological approach to examine humor and brief pauses as cognitive-rest strategies among higher education students. Interviews showed reduced mental overload and improved engagement. The study concluded that purposeful distractions can act as effective brain breaks to maintain focus.
- ✓ **Graeve (2025)** in Improving Academics Using Brain Breaks, conducted a literature-based thesis reviewing research on brain breaks. Data from prior experimental studies indicated improved focus, reduced off-task behaviour, and better academic performance. The study concluded that integrating regular activity breaks enhances learning outcomes across grade levels.

- ✓ **Annoscia & Colella (2025)** in Health Promotion Through Active Breaks, analyzed active classroom breaks as a strategy to reduce children's sedentary behaviour. Through conceptual analysis and evidence review, the authors found movement breaks improved physical engagement and reduced sitting time. The study concluded that active breaks are essential for promoting school health.
- ✓ **Shivers (2025)** in Exploring Elementary Educators' Perspectives on Play Breaks, used qualitative interviews with elementary teachers. Data collection focused on experiences implementing short play-based breaks. Teachers reported improvements in attention, behaviour regulation, and socio-emotional development. The study concluded that play breaks positively influence classroom functioning.
- ✓ **Melo et al. (2025)** in Effects of Physically Active Lessons and Active Breaks on Cognition, conducted a cluster RCT with elementary children. Using cognitive tests, data showed physically active lessons produced greater cognitive benefits than short breaks. The authors concluded that integrated movement lessons amplify learning more than isolated breaks.
- ✓ **Muñoz-Parreño et al. (2025)** in Neurophysiological Effects of Active Breaks, used an experimental design with EEG measures among young students. Data revealed increases in alpha and beta brainwave activity after active breaks, indicating enhanced attention and cognitive readiness. The study concluded that active breaks produce measurable neurological improvements supporting learning.
- ✓ **Minneo (2025)** in Activity Breaks to Improve Attention, conducted an action research study with 3rd-grade students. Using teacher observations and performance tasks, data showed reduced off-task behaviour and improved focus after daily movement breaks. The study concluded that simple, structured activity pauses improve classroom attentiveness and behaviour.
- ✓ **Honas et al. (2024)** in The Intensity of 10-Minute Classroom Physical Activity Breaks, compared PAAC-3 and GoNoodle sessions among 71 elementary children. Using an experimental design, the study used accelerometers to measure activity intensity during 10-minute breaks. Data showed PAAC-3 produced higher moderate-to-vigorous physical activity than GoNoodle. The authors concluded that PAAC-3 is more effective in increasing intensity levels during classroom breaks.
- ✓ **Sharpe et al. (2023)** in Micro-breaks for Concentration, examined effects of micro-breaks among 253 undergraduates. Using a mixed-methods approach with performance tasks and questionnaires, data showed micro-breaks helped sustain attention and slow performance decline. Qualitative feedback highlighted reduced mental fatigue. The study concluded that micro-breaks are beneficial during long academic tasks.

International literature consistently highlights significant benefits of brain breaks:

- ➢ Improvements in attention, working memory, and processing speed.
- ➢ Increase in physical activity, reducing sedentary behaviour.
- ➢ Enhanced engagement, motivation, and classroom participation.
- ➢ Positive effects on psychological well-being and stress reduction.
  Movement-based brain breaks and video-assisted programs dominate global research and have shown strong outcomes among primary and secondary students.

Review of Indian Studies:

- ✓ **Jagdale & Shendkar (2025)** in The Effect of Active Brain Breaks Programme on Attention, examined whether a 2-week brain break intervention enhances attention in elementary school children. They used an experimental method with 40 students divided into control and experimental groups. Attention was measured using the D2 Test before and after daily 2–3 minute active breaks. Data showed slight improvement but no significant difference between groups. The study concluded that short-term interventions may not strongly influence attention and longer, structured brain breaks may be required.
- ✓ **Kumar et al. (2025)** in Effect of Brain Break Classroom Video-Based PA Intervention, aimed to evaluate the effects of video-based activity breaks on fitness and well-being among pre-adolescents. A quasi-experimental design with 110 students (experimental and control groups) was used. Tools included EUROFIT, WHO Well-Being Index, and PAES, with daily 2–5 minute video breaks over 12 weeks. Findings revealed significant gains in physical fitness, resilience, and enjoyment. The researchers concluded that structured video-based brain breaks are effective for physical and psychological enhancement in school settings.
- ✓ **Goswami (2025)** in Breaking the Cycle: How Brain Breaks Enhance Cognitive Performance in Educational Assessments, examined the effect of structured brain breaks on exam performance and well-being among 48 B.Ed. trainees. Using a quasi-experimental, counterbalanced design, students completed two exams—one with a 15-minute brain break and one without. Data were collected through academic achievement scores, a validated 5-item feedback scale, and open-ended responses. Results showed significantly higher overall scores with brain breaks and better concentration, reduced fatigue, and lower stress levels. Within-exam section scores (before vs. after break) showed no significant difference. The study concluded that brain breaks enhance exam readiness, mental freshness, and emotional stability, supporting their inclusion in examination settings.

- ✓ **Swetha et al. (2024)** in their study Exploring the Impact of Creative Movement on Experiential Learning, aimed to understand how creative movement supports cognitive, emotional, and physical development in primary children. Using a mixed-methods design, the researchers observed primary school students through activity-based sessions. Data were collected using observational checklists and learning assessments. Results showed improvements in attention, creativity, emotional expression, and participation. The study concluded that creative movement is an effective brain-break strategy that enhances experiential learning and overall child development.
- ✓ **Kerketa (2024)** in Enhancing Learning Through Physical Activity Breaks, explored how PA breaks influence concentration and academic performance among 120 middle school students. Using action research, the study implemented daily movement-based breaks integrated into lessons. Data were collected using pre–post concentration tests, academic scores, and feedback forms. Results indicated improved multitasking, better focus, and higher academic performance. The study concluded that integrating PA breaks supports effective classroom learning and reduces lethargy.
- ✓ **Goswami (2024)** in Enhancing Academic Performance and Reducing Exam Stress Through Brain Breaks, aimed to analyze how short mental breaks affect exam readiness. A literature-based conceptual review was conducted drawing from cognitive load and attention theories. Data were compiled from prior studies on exam stress and brain breaks. Results highlighted reduced stress, better mental clarity, and improved cognitive flexibility. The review concluded that structured brain breaks should be integrated into exam preparation to enhance academic performance.
- ✓ **Remesh & Saroja (2024)** in Effect of Selected Yogasana and SAQ Training, studied obese boys aged 13–16 using an experimental design with three training groups. Tools included physical fitness tests, psychological scales, and academic achievement measures. Data from the 12-week intervention showed improvements in fitness and psychological attributes, with yoga producing better emotional outcomes. The study concluded that structured movement-based breaks benefit physical and academic development in obese adolescents.
- ✓ **Dwivedi (2024)** in Effect of Integrated Yoga Module Intervention, aimed to assess improvements in social maturity, emotional maturity, and academic achievement among senior secondary students. Using an experimental intervention, the study collected data through validated scales and academic scores. Results showed marked improvement in emotional regulation and academic performance. The study concluded that yoga breaks help enhance overall student maturity and academic readiness.
- ✓ **Shimpi et al. (2022)** compared the intensity of short-duration Suryanamaskar with regular physical education in Suryanamaskar Performed for a Shorter Duration. Using a cross-over design with adolescent students, physiological intensity was measured through heart rate and related markers. Data showed Suryanamaskar reached moderate–vigorous intensity comparable to PE sessions. The study concluded that Suryanamaskar can serve as an effective classroom brain break supporting physical fitness.
- ✓ **Malar, S (2022)** This study on Integrative Neuromuscular Training with Yoga/Stretching aimed to assess motor skill improvements among primary boys aged 9–10. An experimental design with four groups (INT, INT+Yoga, INT+Stretching, Control) was used with motor fitness tests. Data collected after a 16-week program showed all experimental groups improved motor skills, with combined INT+Yoga/Stretching outperforming INT alone. The study concluded integrated training enhances motor development more effectively than single-mode exercises.
- ✓ **Atul Sinha (2022)** in Effect of Short Duration Integrated Classroom Yoga Module, explored impacts on physical fitness, cognition, emotional well-being, and personality among high school students. Using an RCT design, students participated in a month-long yoga intervention with tools such as EUROFIT and Stroop tests. Data showed significant improvements across fitness, attention, emotional balance, and personality traits. The study concluded that yoga-based brain breaks support holistic youth development.
- ✓ **Sinha et al. (2021)** in Development, Validation and Feasibility of a Classroom Yoga Module, aimed to create and validate a short-duration yoga module for high school students. Using expert validation and pilot testing with 49 students, tools such as Stroop, EUROFIT, and self-esteem scales were employed. Pre–post tests revealed improvements in cognition, fitness, and self-esteem. The study concluded that classroom yoga is feasible, effective, and suitable for brain-break integration.
- ✓ **Satish (2021)** in Evaluation of Effects of Yoga vs Physical Training, aimed to compare yoga with physical training among 802 rural school children. Using a randomized controlled design, students completed two-month interventions measured through fitness and cognitive tasks. Data collection showed yoga improved memory, attention, and flexibility, whereas physical training strengthened endurance and cardiovascular fitness. The study concluded yoga can be an effective cognitive-enhancing brain break practice.
- ✓ **Ceby George (2018)** in Attitude Toward Physical Activity, Psychological Attributes, and Academic Achievement, aimed to understand the relationships among these variables in college students. Using a survey-based methodology with validated questionnaires, data were collected from undergraduate students. Results showed positive correlations between physical activity attitudes, psychological well-being, and academic scores. The study concluded that active lifestyle practices, including brain-break-like movement, support academic success.
- ✓ **Telles et al. (2013)** compared yoga and physical exercise effects on cognitive and emotional outcomes in Effect of Yoga or Physical Exercise on Children. A randomized controlled trial with 98 children used cognitive and fitness tests to measure outcomes. Data showed both interventions improved cognition and fitness, but yoga produced greater emotional benefits. The study concluded yoga-based breaks may be more beneficial for holistic development.

Indian research on brain breaks are limited but growing. Existing studies highlight benefits such as improved physical fitness, cognitive performance, psychological well-being, flexibility, and academic achievement. However, few studies assess long-term cognitive outcomes, teacher perspectives, or implementation challenges. Most interventions focus on yoga-based or physical activity breaks, with minimal research on mindfulness and music-based brain breaks.

Mapping the distribution of studies across age groups: The pie charts developed for Objective 4 illustrate the concentration of research activity across age groups. Internationally, brain-break and activity-break interventions have been studied across a wider age spectrum, with primary-level learners representing the largest segment. National studies, however, remain heavily school-centric, with scarce evidence for adolescent populations and negligible investigations in higher education. This imbalance highlights substantial gaps in the Indian research landscape, emphasizing the need for diversification of age groups in future studies.

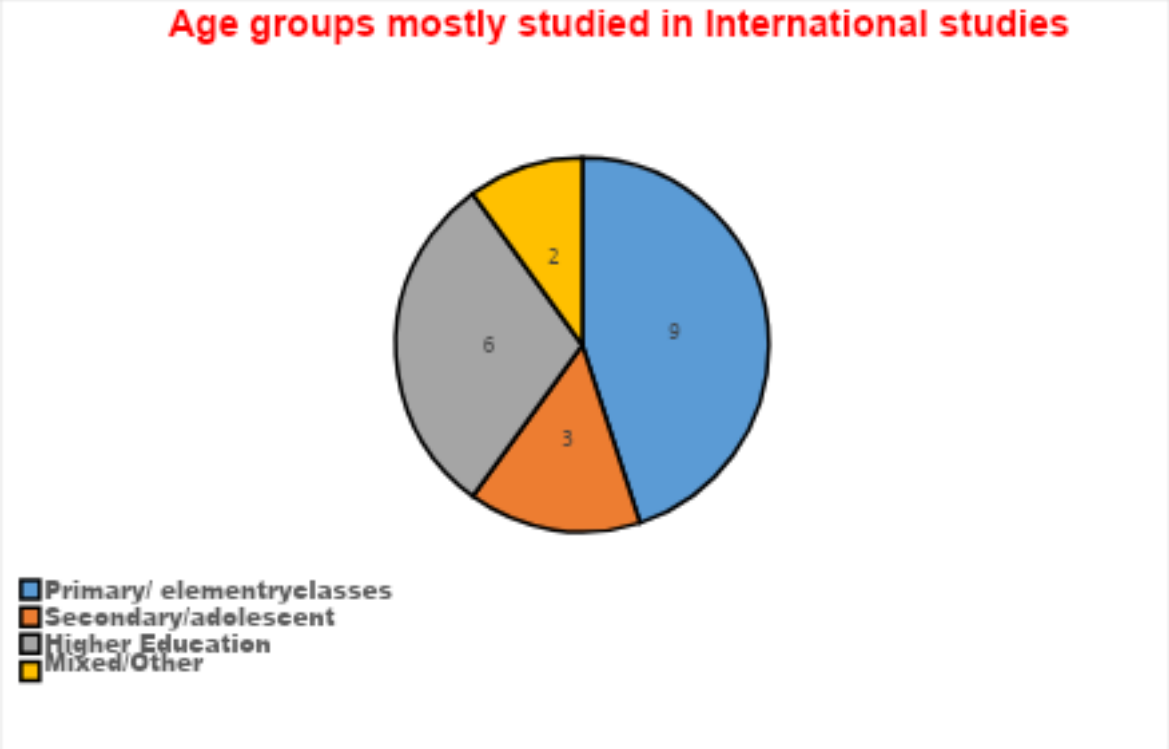


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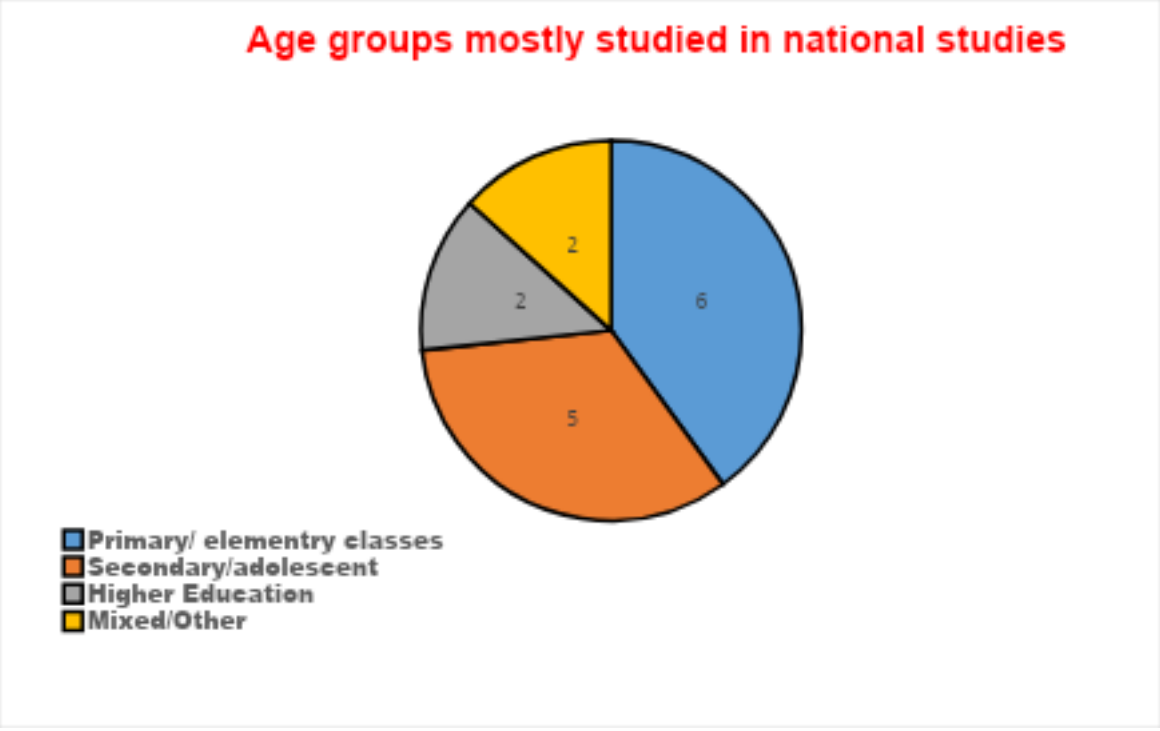


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Research Gaps Identified:

- Very limited Indian research, particularly on academic outcomes.
- Few studies explore teacher perceptions and implementation challenges.
- Scarce research in secondary and higher-education settings.
- Lack of longitudinal and large-scale experimental studies.
- Minimal research on music-based and mindfulness-based brain breaks in India.

Discussion: The findings suggest that brain breaks have strong potential to improve learning environments by enhancing attention, reducing fatigue, and increasing engagement. International evidence is well established, but the limited Indian research calls for further exploration.

Conclusion: Brain breaks represent an effective and practical tool to improve classroom learning. This review highlights the robust global evidence supporting their benefits and identifies significant research gaps in the Indian context. Broader, context-specific studies will enable more effective integration of brain breaks into classroom practice.

Future Directions: Future research should consider expanding brain break interventions across diverse Indian educational settings, including secondary and higher education institutions. Longitudinal studies are needed to examine sustained effects on academic performance, cognitive functions, and emotional well-being. Research should also investigate teacher training needs, cultural adaptations of brain break activities, and integration with technology-based tools such as mobile apps and interactive classroom platforms.

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