Mindfulness for equity and engagement: A case study of innovative pedagogy in rural Sri Lanka

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Abstract

This study examines the impact of mindfulness practices as an innovative pedagogy on holistic student development of grade 10 and 11 students at a secondary school in a rural area of Sri Lanka. Using a quasi-experimental design (N = 154), the study implemented structured mindfulness sessions three times per week over a six-week period, assessing their effects on students' emotional well-being, social behavior, and academic performance. Quantitative results using DASS-21 revealed significant reductions in stress, anxiety, and depression ($p < 0.001$) among the mindfulness group. Quantitative self-report questionnaire data showed increases in social relations, focus, and concentration, but no statistically significant difference in academic achievement was discovered. This study shows that mindfulness intervention can effectively improve students' emotional control, attentiveness, and social interactions, supporting its potential as an inclusive, lifelong learning strategy aligned with global educational priorities.

*Keywords***:** Mindfulness; innovative pedagogy; Emotional Well-being; Social Behavior; Academic Performance

Introduction

A fundamental change is taking place in today's educational environments towards a more comprehensive understanding of student development that goes beyond academic competence. The growing understanding that social skills, emotional intelligence, and resilience are just as important for managing life's difficulties as cognitive ability is what is driving this transformation (Goleman, 1995). As a result, innovative pedagogies must prioritize holistic development beyond academic metrics, emphasizing the importance of nurturing the whole learner—intellectually, emotionally, and socially.

In line with Social-Emotional Learning (SEL) frameworks that place an emphasis on self-awareness, self-management, social awareness, relationship skills, and responsible decision-making, schools are increasingly implementing mindfulness to foster students' emotional and social competencies in addition to their cognitive development (Weissberg et al., 2024). Because of its capacity to promote both academic and personal development, mindfulness—a centuries-old practice—has become increasingly popular in contemporary schools (Kabat-Zinn, 2003). By raising awareness of one's thoughts, feelings, and immediate surroundings, mindfulness – which is defined as the deliberate practice of paying attention to the present moment with openness and without judgment—improves emotional regulation, reduces stress, and improves focus (Brown & Ryan, 2003). Zenner et al. (2014) have shown that mindfulness improves attention and resilience and acts as a mental health buffer in high-pressure educational contexts. By improving working memory, focus, and attention—all of which are essential for learning and problem-solving—mindfulness has been connected to good effects on academic accomplishment in addition

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to emotional advantages (Zeidan et al., 2010; Schonert-Reichl & Roeser, 2016). Additionally, mindfulness promotes positive social behavior, enhancing communication, empathy, and cooperation—all of which help create a more encouraging and helpful learning environment (Sklad et al., 2012).

Given the rising prevalence of mental health issues among Sri Lankan youth, including stress, anxiety, and depression, this work has both academic and practical value (Rasalingam, Rajalingam, Chandradasa, & Nath, 2022). This project investigates mindfulness as a low-cost, culturally flexible teaching tool in response to the pressing need for efficient, scalable therapies. In resource-constrained rural areas, where access to mental health support is frequently restricted, mindfulness emerges as a particularly appropriate method through the integration of traditional practices such as breathwork and visualization into structured classroom routines.

This study presents mindfulness as an innovative pedagogy that supports the fundamental abilities necessary for lifelong learning, rather than just as a therapeutic practice (Jha, Krompinger, & Baime, 2007; Schonert-Reichl & Roeser, 2016). Although there is a wealth of research on the broad advantages of mindfulness for adults, little is known about its overall effects on student outcomes, especially when it comes to social behavior, mental health, and academic performance taken together.

Few studies have looked at the combined impacts in an actual classroom, despite the fact that few have addressed one or two of these characteristics. For example, after receiving mindfulness training, Sri Lankan pupils showed increased attention and engagement (Karunananda & Wijetunga, 2016). However, there are still disagreements on the best frequency, length, and kinds of mindfulness exercises for various age groups (Schonert-Reichl & Roeser, 2016). Consistent teacher preparation and institutional support are also essential for implementation (Kang, Rizzo, May, & Gupta, 2013; Zeidan, Johnson, Diamond, David, & Goolkasian, 2010).

By providing a thorough case study of how structured mindfulness practices affect students' emotional well-being, social behavior, and academic achievement in a secondary school in a rural area of Sri Lanka, this study fills these gaps. By doing this, it adds to the expanding corpus of studies on inclusive, egalitarian, and sustainable educational advances.

This study aims to answer the following research questions:

1. Do mindfulness exercises help students feel less stressed and anxious? If so, how does this affect their academic performance?
2. What effects does the practice of mindfulness have on students' behavior in the classroom, attention span, and focus?
3. Can students who participate in mindfulness programs develop better emotional regulation and self-compassion? If so, how may this help their social connections with classmates and teachers?

Materials and Methods

Research design

The effects of mindfulness techniques on students' social behavior, emotional health, and academic performance were examined in this study using a quasi-experimental design. Due to logistical limitations, a non-randomized pre-test/post-test control group technique was employed instead of randomly allocating students.

Study Context

The study was carried out at a secondary school in a rural area of Sri Lanka. The intervention focused on students in grades 10 and 11 (ages 15–16 years) during a pivotal lifelong learning transition: O/L exams. These students are

at a critical stage of cognitive, emotional, and social development and often experience both academic and emotional challenges. The varied academic and socioeconomic backgrounds of the school offered an appropriate setting for assessing the effects of mindfulness programs.

Participants and sampling

With the support of the school, a purposive sample of 154 grade 10–11 students (77 male, 77 female) were recruited as intact classroom groups from four classes. This approach minimized academic disruption while enabling the real-world implementation of mindfulness as a classroom pedagogy. The students were assigned to two groups: The "mindfulness" group (n = 77) participated in structured mindfulness-based classroom sessions conducted three times a week for six weeks, and the control group (n = 77) continued with their regular classroom routines without the integration of mindfulness practices.

Mindfulness Intervention

The six-week mindfulness protocol was implemented as a pedagogical innovation tailored for low-resource classroom environments. The intervention featured 10-minute sessions conducted three times a week—on Mondays, Wednesdays, and Fridays. Designed to coexist with and complement academic instruction, the sessions were facilitated by a qualified classroom teacher with academic training in sociology and psychology, reinforcing the approach's sustainability without reliance on external specialists. Each session included guided breathing techniques (e.g., inhaling and exhaling to a 1-2-3 count), posture and body awareness training, visualization exercises (such as color focus and "serene tree" imagery), and basic emotional regulation and relaxation strategies.

These activities were designed with the purpose of enhancing students' present-moment awareness, emotional control, and attention span and incorporated Kabat-Zinn's (1994) core mindfulness tenets such as present-moment focus, non-judgmental stance, and simplified practices for adolescent attention spans.

Instruments and Data Collection

Three primary sources of information were used:

1. Academic Performance: Test results for the first and second terms (average term test marks for all subjects for each student) were gathered from school records to assess any changes in academic achievement. The first-term test served as a baseline to confirm group comparability before the mindfulness intervention, and the second-term test, which was administered after completing the mindfulness program, served as a post-test to assess changes in academic performance between the two groups over time.

2. Emotional Well-being: After the intervention, emotional states were measured using the Depression, Anxiety, and Stress Scale (DASS-21), which has been validated for the local population. The DASS-21 comprises 21 items rated on a 4-point Likert scale, measuring levels of depression, anxiety, and stress. This scale was selected because it provides a reliable and efficient measure of key aspects of emotional well-being that mindfulness interventions are designed to influence.

3. Social Behavior and Perception: After the intervention, students' self-perceptions of focus, behavior, emotional control, and peer interactions were evaluated using a researcher-developed quantitative Likert-scale questionnaire, designed with reference to prior studies, relevant literature, and recommendations from the teacher who delivered the mindfulness program to ensure contextual appropriateness.

Data analysis

Quantitative data were analyzed using IBM SPSS Statistics (Version 21), and the following analyses were conducted:

1. Compared the mindfulness and regular groups' academic performance using the term test scores of the students. To ensure the validity of results, key statistical assumptions were tested prior to hypothesis testing. Normality was assessed using the Shapiro–Wilk test. For the first-term test marks, normality was met for both the mindfulness group (p = .672) and the regular group (p = .333). For the second-term test scores, normality was met for the regular group (p = .214) but violated for the mindfulness group (p = .006). Homogeneity of variance was evaluated using Levene's test, which indicated that the assumption of equal variances was met for both the first-term ($F(1,152) = 0.582$, $p = .447$) and second-term ($F(1,152) = 0.043$, $p = .837$) test marks. Outliers were checked using boxplots, with no outliers detected in either term test marks.

   An independent samples t-test was used to compare academic performance between the mindfulness and regular groups for the first-term test marks, as assumptions of normality, homogeneity of variances, and absence of outliers were met. For the second-term test marks, where normality was violated in the experimental group, the non-parametric Mann–Whitney U test was employed to compare the two groups.

2. DASS-21 evaluation: Emotional states were measured using the DASS-21, which assesses depression, anxiety, and stress. Each subscale's raw score was doubled to make it comparable with the full 42-item DASS (DASS-42), allowing scores to be classified using the standard severity categories: normal, mild, moderate, and severe. This adjustment ensures that the results can be interpreted against established normative cut-offs. Clustered bar graphs were then used to visually compare the distribution of these severity levels across the mindfulness and control groups.

3. Chi-squared test was used to analyze responses on the researcher-developed Likert-scale questionnaire to assess how the mindfulness group and the regular group differed in terms of attentiveness, emotional control, and social engagement. The assumptions for the chi-square test include independence of observations and sufficient expected cell frequencies (all expected counts ≥ 5 or all expected count ≥ 1 and at least 80% of all expected counts ≥ 5). However, some expected cell counts were below this threshold. Therefore, these categorical levels were meaningfully combined to meet the adequate expected frequencies.

Results

Academic Performance

An independent samples t-test was conducted to compare baseline academic performance (first-term test marks) between the mindfulness and regular groups. Results showed no significant difference in baseline scores between the groups, t(152) = 1.35, p = .179. The mean difference was 3.58 percentage points (95% CI: -1.65 to 8.82), with a small effect size (d = 0.216), suggesting the two groups were reasonably comparable. Figure 1 shows that both the Mindfulness group and the Regular group had higher mean test marks in the second term compared to the first term, with the second term value being similar across groups.

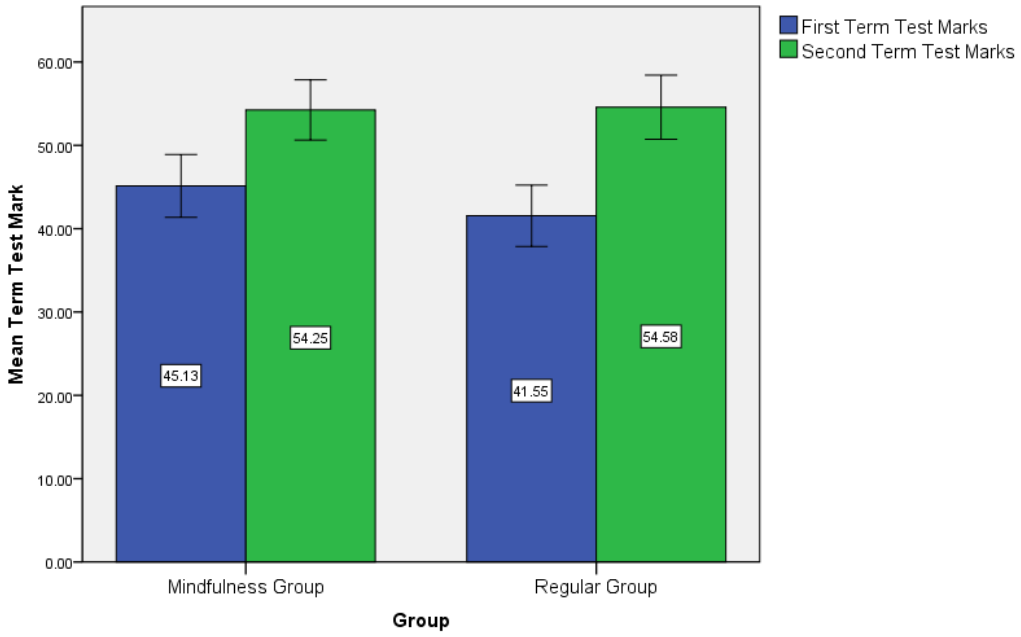

Figure 4

Clustered bar chart of the mean first and second-term test marks. Bars represent a 95% confidence interval of the group means.

Due to a violation of the normality assumption in the mindfulness group (Shapiro–Wilk $p < .05$), a non-parametric Mann–Whitney U test was conducted to compare second-term academic performance between the mindfulness and regular groups. The results showed no statistically significant difference between groups, $U = 2953$, $p = .968$. The effect size, measured using rank-biserial correlation, was very small ($r_{(b)} = 0.004$), indicating no practical difference in post-test performance following the mindfulness intervention.

Emotional well-being (DASS- 21 Analysis)

Students took the DASS-21, which evaluates stress, anxiety, and depression, after the intervention. As shown in Figure 2, the scores were divided into normal, mid, moderate, and severe levels. The clustered bar chart shows that nearly all students in the mindfulness intervention group reported normal levels of depression, anxiety, and stress, with almost no cases in higher severity categories. In contrast, the no-intervention group had significantly fewer students in the normal range and notable numbers experiencing mild to extremely severe symptoms.

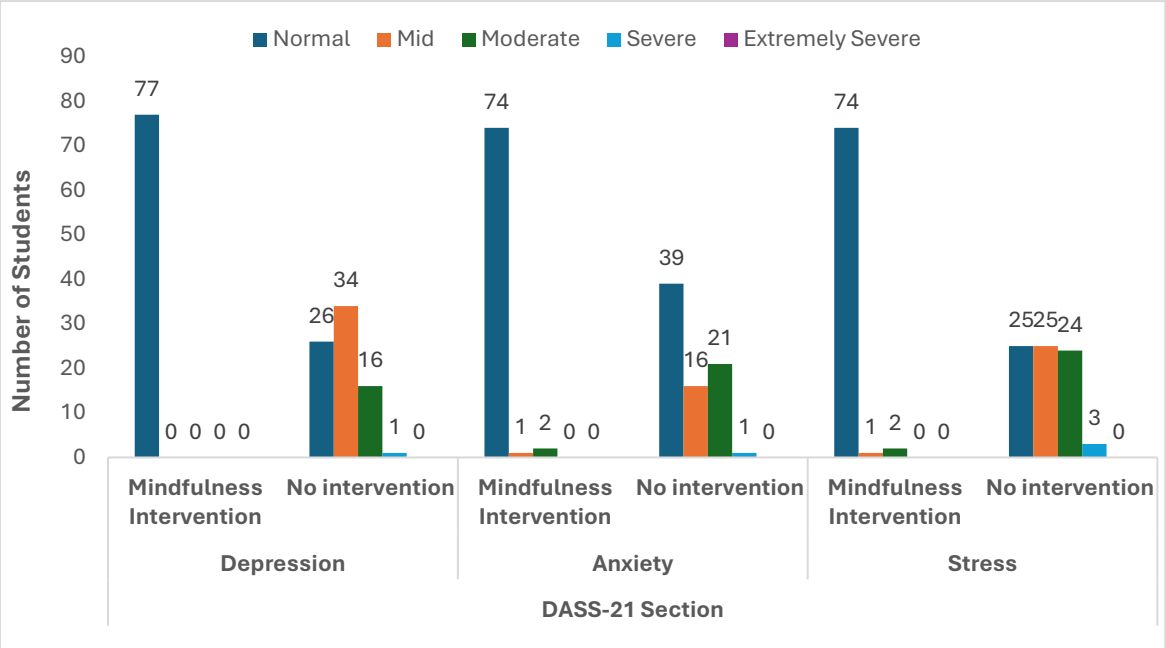

Figure 5

Clustered bar graph of the count of students for each DASS-21 section

Social behavior (Researcher-developed questionnaire analysis)

To determine whether replies varied substantially from the control group, a chi-square test was employed, and the following results, shown in Table 1, were obtained. The null hypothesis (H_0) posits that there is no relationship between students' responses to each questionnaire item and whether or not they received the mindfulness intervention.

Table 1

Chi-Square analysis output summary for the researcher-created Likert-scale questionnaire

	Question	χ^2 Value	Df	p-value	H_0 Decision
1	Do you feel that mindfulness practices helped you to focus better in class?	139.062	4	< .001	Rejected
2	Do you feel that mindfulness practices helped you to pay attention to your teacher more effectively?	124.249	4	< .001	Rejected
3	Since participating in mindfulness practices, have you noticed any improvement in your focus and concentration during class?	27.769	2	< .001	Rejected
4	Do you feel it is easier to complete your homework and assignments?	5.168	3	.160	Not Rejected

5	Have your grades improved since you started practicing mindfulness?	111.468	3	< .001	Rejected
6	Since participating in mindfulness practices, do you feel that you have become more patient and understanding of others?	1.192	4	.879	Not Rejected
7	Do you find it easier to control your anger and frustration?	18.561	2	< .001	Rejected
8	Do you feel more confident in your interactions with peers?	154.000	4	< .001	Rejected
9	Have you noticed any changes in your ability to empathize with others?	122.985	3	< .001	Rejected
10	Do you believe that mindfulness practices have helped you develop stronger relationships with your peers?	135.579	3	< .001	Rejected

Discussion

The most significant outcome of this study was the improvement in students' emotional well-being. According to DASS-21 score analysis, students in the mindfulness group reported lower levels of depression, anxiety, and stress compared to those in the control group. This corroborates past studies on the advantages of mindfulness for mental health.

In addition to emotional improvements, students who practiced mindfulness reported greater attentiveness and focus during the class. The chi-square analysis (Table 1) revealed a statistically significant association between students' responses and mindfulness intervention for 8 out of 10 questionnaire items, particularly in areas such as improved focus, emotional regulation, confidence, empathy, and peer relationships, with the mindfulness group reporting more favorable outcomes. This suggests that even a short intervention can contribute meaningfully to classroom behavior and students' ability to manage emotions and engage socially.

However, no statistically significant improvement was found in academic performance, as measured by term test scores. This could be because of the program's brief duration or the academic assessment's narrow focus. Long-term impacts should be investigated in future studies.

A noteworthy finding is the contrast between the objective and the students' self-reported perception of academic performance. Although the Mann-Whitney U test showed no statistically significant improvement in the term test scores, the chi-square analysis (Table 1, question 5) indicated that students who received mindfulness training perceived their grades as having improved ($p < .001$). This suggests that while the short-term intervention may not have been sufficient to impact measurable academic performance outcomes, it fostered a greater sense of academic self-efficacy, confidence, and optimism among students, leading them to have a more positive outlook on their academic abilities. This divergence between perception and reality is a significant finding and warrants further exploration in future research.

The study has several limitations. The intervention was short-term, only lasting six weeks, data were collected from a few classes in a single school, and relied heavily on self-reported data, including Likert-scale responses. Future

research should consider longer interventions, multiple schools, and mixed-methods approaches to gain deeper insights into both short- and long-term impacts of mindfulness practices.

Conclusion

This study demonstrates that mindfulness practices serve as an effective, low-cost pedagogical intervention for improving emotional well-being and classroom engagement among Grade 10–11 students in rural Sri Lanka, despite showing neutral effects on short-term academic performance.

Key findings revealed that, in terms of emotional resilience, students in the mindfulness group showed significantly lower levels of depression, anxiety, and stress. In class, they also reported improved social relations, focus, and attentiveness. These results demonstrate the importance of mindfulness for the well-being of students. Although academic benefits may take longer to manifest, the improvements in behavior and emotional stability observed here suggest that mindfulness has the potential to contribute to sustained academic growth over time. Overall, mindfulness emerges as a promising teaching strategy that supports students' emotional, social, and cognitive development.

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