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Article

Implementation of Collaborative and Active Learning Strategies in Medical Education: An Institutional Study at All Saints University School of Medicine, Dominica

Article History:

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Abstract: **Background**: Traditional lecture-based teaching has limitations in fostering problem-solving, teamwork, and global medical competency. Active and collaborative learning approaches are increasingly recognized as effective alternatives in medical education. Objective: To evaluate the implementation of collaborative and active learning strategies and assess their impact on student engagement, academic performance, and perceptions at All Saints University School of Medicine, Dominica. **Methods**: A two-month institutional study was conducted among 100 undergraduate medical students. Collaborative strategies including team-based learning, peer-assisted learning, and flipped classroom sessions were introduced. Data were collected through pre- and post-intervention assessments, attendance records, classroom participation, and structured feedback surveys. Academic performance was measured using Objective Structured Practical Examination (OSPE) and multiple-choice questions (MCQ). Descriptive and inferential statistics were applied, with $p < 0.05$ considered significant. **Results**: The mean age of participants was 21.6 ± 2.1 years, with 54 males and 46 females. Active class participation improved from 38% pre-intervention to 82% post-intervention, while regular attendance increased from 72% to 91%. OSPE scores rose significantly from 61.2 ± 8.4% to 74.6 ± 7.9% ($p < 0.001$), and MCQ scores from 58.5 ± 9.1% to 72.1 ± 8.7% ($p < 0.001$). Student feedback indicated high satisfaction, with mean Likert scores above 4.2 across domains of critical thinking, teamwork, motivation, and conceptual understanding. Overall, 88% of students preferred active learning methods over traditional lectures. **Conclusion**: Implementation of collaborative and active learning strategies enhanced student engagement, academic performance, and satisfaction. These findings support their integration in Caribbean medical curricula to strengthen global medical competency.

Keywords: Active learning, Collaborative learning, Medical education, Student engagement, Global competency, Caribbean.

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Introduction

Medical education is undergoing a global transformation, with a progressive shift from traditional lecture-based models to more dynamic, learner-centered approaches. Conventional didactic teaching, while efficient for delivering large volumes of content, often fails to develop essential higher-order skills such as critical thinking, clinical reasoning, teamwork, and problem-solving [1,2]. These competencies are increasingly important as medical graduates must adapt to complex healthcare environments and address global health challenges.

To address these limitations, a range of collaborative and active learning strategies have been introduced into medical curricula. Approaches such as team-based learning (TBL), problem-based learning (PBL), flipped classrooms, and peer-assisted learning actively engage students in the educational process, promoting deeper conceptual understanding and strengthening interpersonal and professional skills [3–5]. Evidence indicates that these methods enhance knowledge retention, improve clinical reasoning, and foster adaptability and global competency among medical trainees.

In the Caribbean, medical schools face unique challenges including resource constraints, culturally diverse student populations, and the necessity of aligning curricula with international standards of practice. Recognizing these factors, All Saints University School of Medicine, Dominica, has initiated efforts to implement collaborative and active learning strategies into its undergraduate medical program. This study was designed to evaluate the short-term effects of such strategies on student engagement, performance, and perceptions, thereby contributing regional insights to the global dialogue on medical education reform.

The present study aimed to evaluate the short-term impact of implementing these strategies over a two-month period, focusing on student engagement, academic performance, and perceptions. By documenting both outcomes and institutional reflections, this study seeks to provide insights into the feasibility and effectiveness of active learning in a Caribbean medical education context.

Methodology

Study Design and Setting:

This was a two-month prospective institutional study conducted at All Saints University School of Medicine, Dominica, between June and July 2025. The study aimed to evaluate the impact of collaborative and active learning strategies on student engagement, academic performance, and perceptions.

Study Population:

A total of 100 undergraduate medical students were enrolled. Inclusion criteria comprised students from both pre-clinical and clinical phases who consented to participate. Exclusion criteria included students absent for more than 20% of sessions during the study period.

Intervention:

Collaborative and active learning strategies were introduced into the existing curriculum. These included:

Team-Based Learning (TBL): Small-group problem-solving sessions.

Flipped Classroom: Pre-class distribution of study materials followed by in-class discussions.

Peer-Assisted Learning (PAL): Students teaching and facilitating sessions under faculty supervision.

Traditional lecture-based teaching was reduced but retained for comparison.

Data Collection Tools:

Engagement: Attendance records, participation in group discussions, and observation of classroom interactions.

Academic Performance:

Objective Structured Practical Examination (OSPE) scores.

Multiple Choice Question (MCQ) test scores (pre- and post-intervention).

Student Feedback: A structured questionnaire using a 5-point Likert scale assessed domains such as critical thinking, teamwork, motivation, conceptual understanding, and preference for active learning.

Faculty Observations: Qualitative reflections regarding feasibility, strengths, and challenges of implementation.

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Statistical Analysis:

Data were analyzed using SPSS version 25. Descriptive statistics were expressed as mean ± standard deviation (SD) or percentages. Pre- and post-intervention OSPE and MCQ scores were compared using paired *t*-tests. A p-value of <0.05 was considered statistically significant.

Results

A total of 100 undergraduate medical students participated in the study. The mean age of the cohort was 21.6 ± 2.1 years, with a slight predominance of males (54%) compared to females (46%). The majority of students were in the pre-clinical phase (62%), while 38% were clinical students (Table 1).

Table 1. Demographic Characteristics of Participants (n = 100)

Characteristic	Number of Students	Percentage (%)
Mean Age (years)	21.6 ± 2.1	–
Gender: Male	54	54.0
Gender: Female	46	46.0
Year of Study (Pre-clinical)	62	62.0
Year of Study (Clinical)	38	38.0

Following the introduction of collaborative and active learning strategies, a marked improvement was observed in student engagement. Active classroom participation increased from 38% before the intervention to 82% after the intervention. Similarly, regular attendance (>80%) improved from 72% to 91%, and volunteering in group discussions rose from 41% to 79% (Table 2).

Table 2. Student Engagement Before and After Intervention

Parameter	Pre-Intervention (%)	Post-Intervention (%)	Change (%)
Active Participation in Class	38	82	+44
Regular Attendance (>80%)	72	91	+19
Volunteering in Group Discussions	41	79	+38

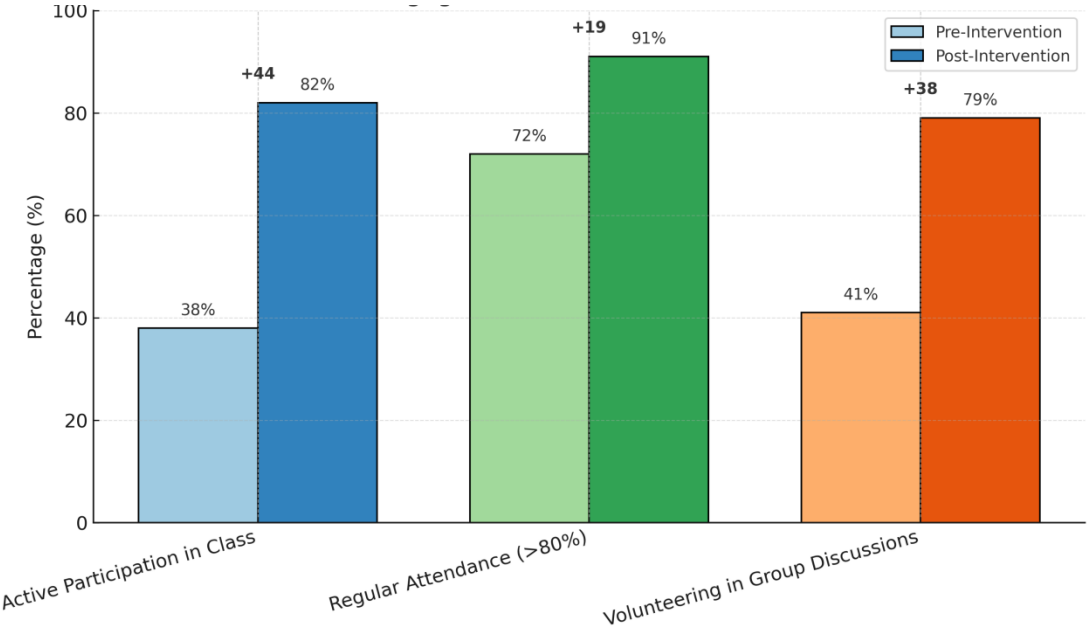

Figure 1. Student Engagement Before and After Intervention

Academic performance also demonstrated significant enhancement after the two-month intervention. The mean OSPE score increased from 61.2 ± 8.4% to 74.6 ± 7.9%, while the mean MCQ score improved from 58.5 ± 9.1% to 72.1 ± 8.7%. Both improvements were statistically significant ($p < 0.001$) (Table 3).

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Table 3. Academic Performance Scores

Assessment Type	Pre-Intervention (Mean ± SD)	Post-Intervention (Mean ± SD)	p-value
OSPE (%)	61.2 ± 8.4	74.6 ± 7.9	<0.001
MCQ (%)	58.5 ± 9.1	72.1 ± 8.7	<0.001

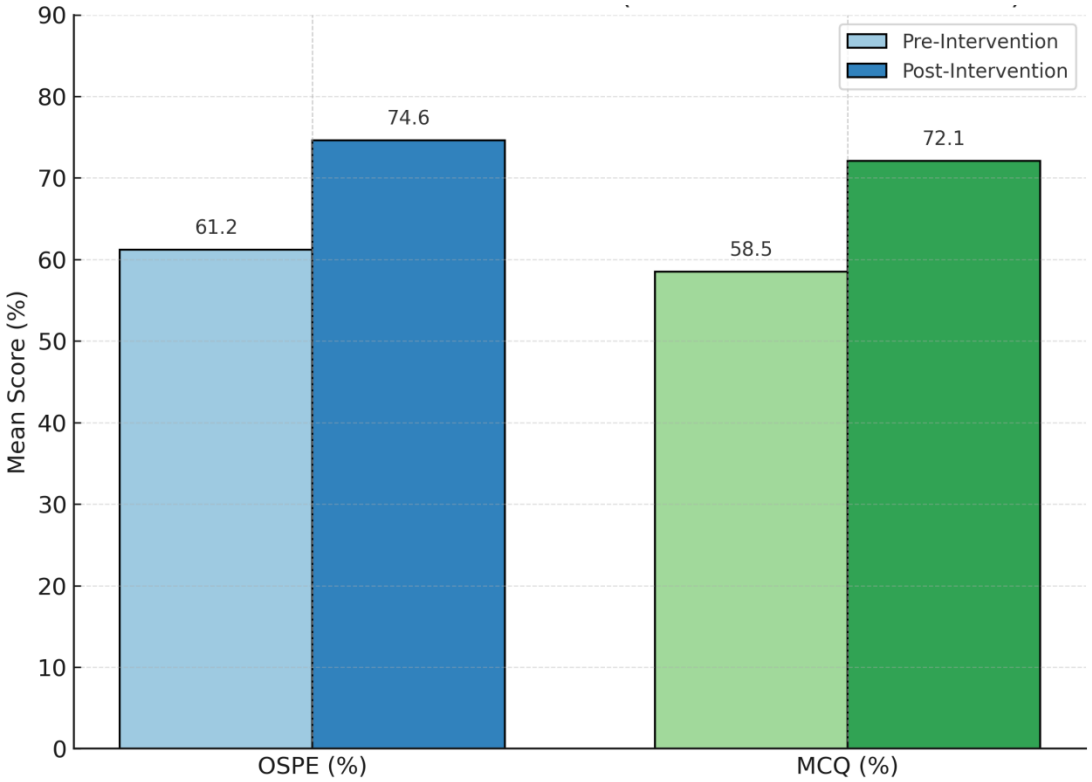

Figure 2.Academic Performance Scores(Pre vs Post Intervention)

Student feedback revealed a strong preference for collaborative and active learning. High mean scores were recorded across domains including critical thinking (4.3 ± 0.6), teamwork (4.5 ± 0.5), motivation to learn (4.2 ± 0.7), conceptual understanding (4.4 ± 0.6), and preference over traditional methods (4.6 ± 0.5) (Table 4). Overall, 88% of participants reported that active learning approaches enhanced their educational experience.

Table 4. Student Feedback on Active Learning (Likert Scale, 1–5)

Feedback Domain	Mean Score (±SD)
Improved critical thinking	4.3 ± 0.6
Better teamwork and collaboration	4.5 ± 0.5
Increased motivation to learn	4.2 ± 0.7
Enhanced understanding of concepts	4.4 ± 0.6
Preference for active learning methods	4.6 ± 0.5

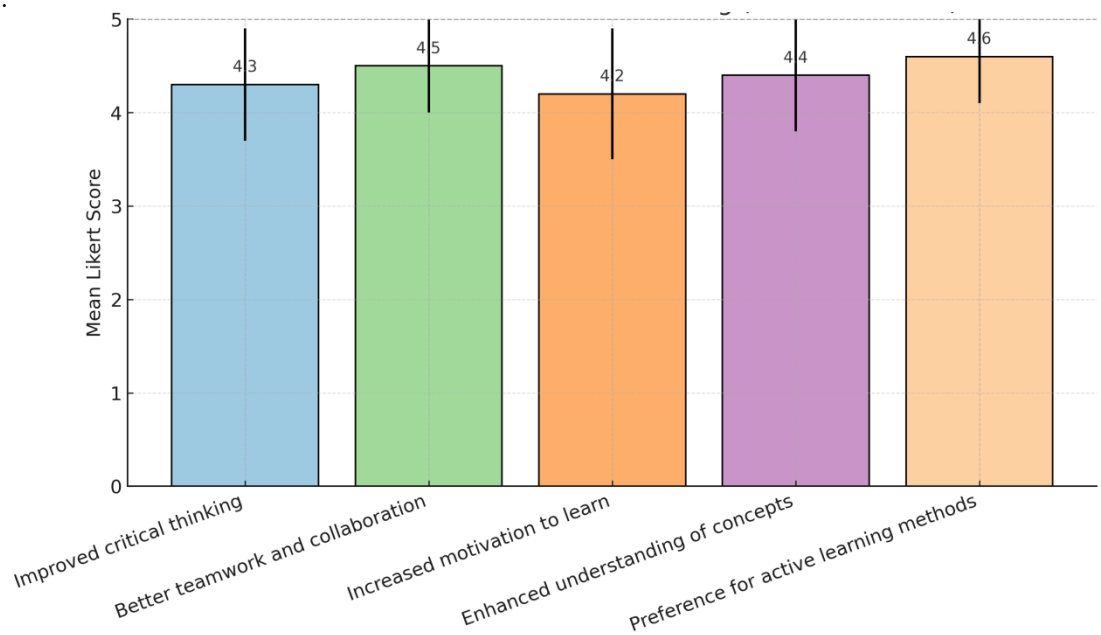

Figure 3.Student Feedback on Active Learning (Likert Scale, 1–5)

Discussion

This study demonstrated that the implementation of collaborative and active learning strategies at All Saints University School of Medicine, Dominica, produced significant improvements in student engagement, academic performance, and overall satisfaction. These outcomes reinforce the growing international evidence that learner-centered approaches are more effective than traditional didactic methods in medical education.

The marked increase in participation (38% to 82%) and voluntary involvement in group discussions reflects the ability of collaborative strategies to create an engaging, inclusive classroom environment. Similar findings were observed in pharmacology teaching, where team-based peer instruction enhanced knowledge acquisition and exam performance [6,12]. Improvements in attendance and motivation also align with prior reports indicating that active approaches foster sustained interest and accountability among students [7,8].

Academic outcomes improved substantially, with OSPE and MCQ scores showing significant gains after the intervention. This parallels earlier studies demonstrating that active learning methods enhance knowledge retention, application, and problem-solving skills [6,9]. By requiring students to prepare in advance and engage during sessions, flipped classroom and team-based models have been shown to improve understanding and long-term retention of complex concepts [11,12].

Student feedback underscored the value of collaborative learning, particularly in strengthening teamwork and critical thinking. Recent studies confirm that collaborative discussions and structured group preparation enhance performance and collective outcomes in medical education [9,10]. Importantly, 88% of students in this study preferred active learning over traditional lectures, echoing broader evidence of a cultural shift toward learner-centered expectations [8,11].

From the faculty perspective, improved student readiness and group collaboration were noted, though challenges such as time-intensive preparation, need for facilitator training, and infrastructural constraints remain. These barriers are consistent with other resource-limited contexts, where phased adoption, faculty development, and resource-efficient models have been recommended to sustain implementation [9,11].

The strengths of this study include its prospective design, structured assessment, and triangulation of quantitative and qualitative data. However, limitations include its short duration and single-institution scope, which constrain generalizability. Future research should consider longer-term, multi-institutional studies to validate these findings and further explore scalable models of collaborative learning in Caribbean medical schools.

Conclusion

The present study highlights that the adoption of collaborative and active learning strategies at

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All Saints University School of Medicine, Dominica, produced measurable academic and behavioral benefits within a short two-month period. Students demonstrated enhanced participation, stronger teamwork, and improved performance in both OSPE and MCQ assessments. Feedback confirmed a clear preference for these learner-centered approaches over traditional lectures. Faculty observations also noted improved readiness and critical thinking, although challenges related to preparation time, training, and resources persist. Overall, these findings emphasize that integrating active and collaborative learning is both feasible and effective in advancing global medical competency in resource-limited Caribbean settings.

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