Original Article

Learners Centered Comparison of Large Group Interactive Session Versus Conventional Lecture: Basic Medical Sciences (Anatomy & Physiology)

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ABSTRACT

Introduction: To impart knowledge to their learners, educational institutions employ a variety of teaching strategies. Many educational institutions regularly employ conventional lecture (CL) teaching methodology in comparison to large group interactive sessions (LGIS), which help to enhance the fundamental abilities needed for all tasks, such as communication skills.
Objective: To evaluate effectiveness and the learner's perception of large group interactive sessions over conventional lectures.
Methods: A cross-sectional study was performed with the help of one hundred first-year MBBS learners who were split into two equal groups, A and B. Both groups received experiences with large group interactive sessions (LGIS) and conventional lectures (CL) during the two phases of the study. There were multiple-choice tests conducted before and after phases 1 and 2. By using a pre-validated questionnaire based on Likert's scale. Pre- and post-test results were compared using the student's t-test, and McNemar's test of preference shift was also applied with $p<0.05$ being regarded as significant.
Results: Group B (LGIS, Phase 1) pre- and post-test scores improved from 26.9 to 29.7 ($p=0.000$); Group A (LGIS, Phase 2) pre- and post-test scores also showed improvement from 17.6 to 19.2 ($p=0.042$). CL results were non-significant; Group A (phase 1) marginally improved from 27.4 to 28.2, $p=0.074$, and Group B (phase 2) improved from 16.1 to 17.1, $p=0.071$).
Conclusion: Active participation and effective communication are key components of LGIS, which also fosters strong knowledge retention. It was added to the new curriculum in an effort to boost learners' productivity.

Keywords: Communication, Curriculum, Interactive, Lecture, Perception

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INTRODUCTION

Educational establishments worldwide employ diverse pedagogical approaches to augment the medical learners' knowledge base (Abdel Meguid & Collins, 2017). Among many institutions, conventional learning is regarded as the best teaching tool. Passive learning is common in this approach, where teachers dominate interactions with learners and instructors are the source of knowledge (Chougule & Patil, 2015). One-way communication is provided in conventional lectures (Mutalik, 2016).

With the introduction of the new modular system curriculum all over Pakistan by the Pakistan Medical and Dental Council (PMDC), one of the most effective learning tools for undergraduate medical learners to acquire the necessary knowledge and competency is the large group interactive session (LGIS) or other methods of active learning (Khanday, 2015). Learners who are taught actively not only become more curious but also gain independence, a greater sense of responsibility, and improved learning retention (Ruscio et al., 1988). Active learning supports their eager learning and helps them become more proficient communicators (Yeruva, 2018). Learners can actively participate in learning, create interest, and develop self-motivation with the help of active learning strategies, which are learner-centred methodologies that improve learning outcomes and assessment (Vadakedath & Kandi, 2019). The study comes to the important conclusion that people are prone to being drawn to any novel technology or approach that is presented, and they will usually follow it. Large group interactive sessions (LGIS) are popular today and are favoured by most. However, this isn't always the case.

METHODOLOGY

This cross-sectional study was conducted over a period of six months, from March 12, 2023, to September 20, 2023, among first-year MBBS learners at Sheikh Zayed Medical College, Rahim Yar Khan. Approval for the study was obtained from the Institutional Ethics Review Committee (IERC/SZMCH/02/2023/01-019) and the Research Committee prior to commencement.

The sample size was calculated using the WHO sample size calculator and the following formula (Sadiq et al., 2024):

A total of 100 learners were deemed sufficient and were recruited for the study. The same 100 learners participated in both Phase I and Phase II of the study. Inclusion criteria included learners who gave informed consent and had no special needs or disabilities. Learners with special needs or those unwilling to provide consent were excluded.

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Upon obtaining informed consent, participants were divided into two equal groups of 50 learners each (Group A: Roll numbers 1–50; Group B: Roll numbers 51–100). In Phase I, the anatomy topic "Brachial Plexus" was covered. Group A attended a conventional lecture (CL) for one hour, while Group B was further divided into two subgroups of 25 learners each (B-α and B-β) to attend a large group interactive session (LGIS) of one hour.

In Phase II, the physiology topic "Cardiac Cycle" was addressed, with a crossover of the groups. Group A was divided into two subgroups (A-α and A-β) and attended the LGIS, while Group B attended the conventional lecture. The topics and subtopics were identical for both groups in each phase.

Three days prior to the LGIS or CL, participants were informed of the topic. A pre-test consisting of 30 multiple-choice questions (MCQs), lasting one hour, was administered to both groups before the teaching session. After attending the CL or LGIS, learners provided feedback using a pre-validated questionnaire designed by the author. The questionnaire used a five-point Likert scale ranging from "firmly reject" to "firmly accept." Combined acceptance (accept + firmly accept) and combined rejection (reject + firmly reject) were recorded (Tanujaya et al., 2023).

Following the teaching session and feedback collection, both groups completed a post-test of 30 MCQs (one hour duration). In Phase II, the same procedure was repeated for the new topic, with group crossover.

Data were analyzed using Epi Info™ version 7.2.6.0, developed by the Centers for Disease Control and Prevention (CDC), Atlanta, Georgia. Data were initially entered into Microsoft Excel. Results were expressed as mean ± standard deviation (SD). Learner perceptions were summarized using percentages for each Likert scale response. A two-sample t-test was used to compare pre- and post-test scores, and McNemar's test was applied to analyze categorical changes. A p-value of < 0.05 was considered statistically significant. Descriptive statistics, including mean, median, and mode, were calculated for the questionnaire responses.

RESULTS

At the end of Phase I (Brachial Plexus, Anatomy), Group A (Conventional Lecture) showed a pre- to post-test improvement with a p-value of 0.074, which was not statistically significant. Conversely, Group B (Large Group Interactive Session) demonstrated a statistically significant improvement, with a p-value of <0.001.

In Phase II (Cardiac Cycle, Physiology), after the reversal of groups, Group B (now receiving Conventional Lecture) again showed a non-significant change in pre- and post-test scores ($p = 0.071$). In contrast, Group A (now receiving LGIS) exhibited a statistically significant improvement ($p = 0.042$). These findings indicate that in both phases, the groups exposed to LGIS consistently achieved statistically significant learning gains, whereas those receiving conventional lectures did not. (Table 1)

Learner perceptions of Conventional Lectures (CL) and Large Group Interactive Sessions (LGIS) were also analyzed. Initially, CL had higher familiarity (90% vs. 60% for LGIS), but lower interactivity ratings—60–80% of learners rejected CL as interactive, compared to 90% acceptance of LGIS in Phase I (declining to 60% in Phase II).

Both teaching methods were initially rated as interesting and helpful for memorization. However, satisfaction declined in Phase II, particularly for CL, with 40% of learners rejecting the adequacy of time and 66% rejecting the level of encouragement. LGIS maintained higher engagement throughout, though some decline in approval for interactivity and time allocation was noted in Phase II.

In Phase I, 80% of participants approved the continuation of CL, and 70% favored LGIS. Rejection rates were 16% and 28% respectively. In Phase II, support for CL dropped significantly to 44%, while LGIS was approved by 60% of learners. Notably, 50% of learners were against continuing CL, compared to only 30% opposing LGIS. Overall, more than 50% of participants preferred continuing with LGIS over CL. (Table 2)

McNemar's test showed significantly stronger preferences for LGIS over CL in key educational domains: interactivity ($p = 0.004$), interest ($p = 0.045$), usefulness for memorization ($p = 0.02$), and willingness for continuation ($p = 0.045$). No statistically significant differences were observed for familiarity ($p = 0.12$), stress reduction ($p = 0.82$), time adequacy ($p = 0.15$), or level of encouragement ($p = 0.90$). These results highlight the distinct advantage of LGIS in fostering learner engagement and perceived educational effectiveness, with interactivity emerging as its most distinguishing strength. (Table 3)

Table 1: Pre and post test analysis of Phase 1 & 2 CL vs LGIS, applied t-test

PHASE 1 RESULTS OF BRACHIAL PLEXUS ANATOMY

Group	Methods (n=50)	Mean± SD	Range	p-value
Group A	Pre-test CL brachial plexus	27.4 ± 2.997	22-28	0.074
	Post-test CL brachial plexus	28.2 ± 3.212	24-30	
Group B (α + β)	Pre-test LGIS brachial plexus	26.9 ± 5.465	24-31	0.000*
	Post-test LGIS brachial plexus	29.7 ± 3.499	18-30	

PHASE 2 RESULTS OF CARDIAC CYCLE PHYSIOLOGY

Group	Methods (n=50)	Mean ± SD	Range	p-value
Group B	Pre-test CL Cardiac cycle	16.1 ± 2.602	17-28	0.071
	Post-test CL Cardiac cycle	17.1 ± 4.799	12-29	
Group A (α + β)	Pre-test LGIS Cardiac Cycle	17.6± 5.729	15-37	0.042*
	Post-test LGIS Cardiac Cycle	19.2 ± 5.131	20-36	

Table 2: Summarized key findings of both phases in percentages.

Merged and summarized response sheet of key findings in percentage % (both phases 1&2)

#	Phases (1&2)	Phase 1 (CL)		Phase 1 (LGIS)		Phase 2 (CL)		Phase 2 (LGIS)	
Evaluation item		Reject	Accept	Reject	Accept	Reject	Accept	Reject	Accept
1	Familiar with method	4.00 %	90.00 %	34.00 %	60.00 %	20.00 %	80.00 %	36.00 %	60.00 %
2	Less tense	12.00 %	82.00 %	18.00 %	80.00 %	18.00 %	80.00 %	28.00 %	70.00 %
3	Interactive	60.00 %	38.00 %	8.00 %	90.00 %	80.00 %	20.00 %	36.00 %	60.00 %
4	Adequate time	30.00 %	60.00 %	4.00 %	94.00 %	40.00 %	56.00 %	60.00 %	40.00 %
5	Interesting	24.00 %	70.00 %	10.00 %	90.00 %	36.00 %	60.00 %	24.00 %	70.00 %
6	Useful to memorize	24.00 %	70.00 %	10.00 %	80.00 %	25.00 %	46.00 %	32.00 %	64.00 %
7	Encouraging	28.00 %	70.00 %	26.00 %	64.00 %	60.00 %	34.00 %	28.00 %	66.00 %
8	Approve continuation	16.00 %	80.00 %	28.00 %	70.00 %	50.00 %	44.00 %	30.00 %	60.00 %

Table 3: Statistical analysis between large group interactive session (LGIS) and conventional lecture (CL) by McNemar's test.

Statistical analysis: Large Group Interactive Session(LGIS) & Conventional lecture (CL)

Rating category/variables	P value (McNemar's)
familiar with method	0.12
Less tense	0.82
Interactive	0.004**
Adequate time	0.15
Interesting	0.045*
Useful to memorize	0.02*
Encouraging	0.90
Approve continuation	0.045*

DISCUSSION

In the current era of rapidly evolving educational needs, it is imperative to adopt teaching strategies that enhance learner efficiency and facilitate accelerated learning. Globally, various teaching–learning approaches have been introduced; however, the primary challenge remains identifying methods that best support learners in achieving their objectives.

In our study, Group A (Phase I) demonstrated a mean post-test score of 28.2 ± 3.212 following a Conventional Lecture (CL) on the Brachial Plexus, with a p-value of 0.074, indicating no statistically significant improvement. In contrast, Group B, exposed to a Large Group Interactive Session (LGIS), achieved a higher mean score of 29.7 ± 3.499, with a statistically significant p-value of <0.001. These findings are in line with previous research by Thotakura and Anuradha (2022), which reported significantly higher multiple-choice question scores in the fishbowl teaching method (10.769 ± 2.875) compared to traditional teaching (8.724 ± 3.614), with a p-value of 0.025. Supporting the effectiveness of interactive strategies, Liu et al. (2024) reported a significant positive correlation between active learning pedagogy and learner engagement ($p = 0.005$), which aligns with our results. However, contrasting findings were noted by Deslauriers et al. (2019), who reported a learner preference for passive lectures, with higher mean preference scores (3.9 vs. 2.9; $p < 0.001$) despite the lower actual learning gains.

Our study's findings remained consistent across both phases, with LGIS showing statistically significant improvement in learner scores in Phase I ($p < 0.001$) and Phase II ($p = 0.042$), while CL remained statistically insignificant in both. This supports results reported by Kozanitis and Nenciovici (2022), who found that learners' performance increased by 0.489 standard deviations under active instruction ($p < 0.001$). However, Flugelman et al. (2022) reported non-significant improvements in grades with active learning ($p = 0.36$), though they noted better outcomes in specific disciplines like psychology.

Our findings also support the value of LGIS in promoting memory retention. Learners rated the method highly for memorization in both phases, with 80% and 64% agreement on the Likert scale. These results are comparable to those of Jaiswal (2023), who reported learner acceptance rates as high as 93.54%. While in Phase I, the conventional lecture received slightly more support in terms of motivation (70% vs. 64% for LGIS), this trend reversed in Phase II, where only 34% supported CL compared to 64% for LGIS. These trends are consistent with the findings of Peng et al. (2022), who emphasized the motivational benefits of active learning strategies.

Furthermore, our results showed that the majority of participants

in both phases supported the continued use of active learning methods. Similar findings were reported by Moin et al. (2024), who, using the jigsaw technique, demonstrated significantly higher median assessment scores ($p = 0.003$) in the active learning group compared to controls. On the other hand, Nysveen et al. (2022), studying four different active learning strategies in a sample of 255 students, found no direct impact on learner performance satisfaction.

Taken together, our study reinforces the growing body of evidence supporting the effectiveness of active learning approaches like LGIS in improving academic outcomes, learner satisfaction, and engagement, while acknowledging that outcomes may vary across disciplines and contexts.

CONCLUSION

This study demonstrated that learners significantly preferred Large Group Interactive Sessions (LGIS) over Conventional Lectures (CL), particularly in terms of interactivity, engagement, and memorization. Despite logistical constraints, LGIS emerged as a more effective strategy for promoting active learning in basic sciences education. These findings highlight the need for integrating modern, interactive teaching methods or hybrid approaches into medical curricula. Future research should focus on refining interactive formats, incorporating clinical subjects, and evaluating long-term learning outcomes to support evidence-based educational reform.

LIMITATIONS

This short-duration study was limited to two basic science topics and included only English-proficient learners. It focused solely on one active learning method (LGIS) and excluded clinical subjects. Resource constraints prevented inclusion of final-year students, limiting broader applicability.

DECLARATION OF INTEREST

The authors declare no conflict of interest.

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AUTHOR'S CONTRIBUTION

1 Z.F.R.: Conceived the idea, designed the study and write up
2 **Z.A.R.:** Data collection and final approval
3 B.M.I.: Manuscript write up critical review
4 K.Z.: Data analysis and critical review