

# Perception of Interactivity in General Embryology Lecture Classes Among First-Year Medical Students: A Cross-Sectional Study in Bangladesh

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DOI: <https://doi.org/10.36348/sijap.2025.v08i03.002>

| Received: 29.05.2025 | Accepted: 03.06.2025 | Published: 05.06.2025

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## Abstract

**Background:** Interactive teaching strategies have been shown to enhance student engagement and learning outcomes in medical education. However, the extent to which first-year medical students in Bangladesh perceive interactivity in lectures remains unclear. This study aimed to assess students' perceptions of interactivity in General Embryology lecture classes. **Objectives:** To analyze the perceptions of Bangladeshi medical undergraduates regarding interactivity in the General Embryology lecture classes. **Methods:** In this study two surveys were conducted on 232 undergraduates of two medical colleges of Bangladesh using a questionnaire designed by the researcher to analyze the perceptions of the undergraduates regarding how the lecturers try to make their General Embryology lectures 'understandable and interesting'. **Results:** The survey results regarding the perceptions and views of the medical undergraduates show that out of the 55 questions regarding interactivity, the Embryology lectures scored three (3) or more out of four (4) in case of only two (2) of the questions. Two (2) or more was obtained in case of eighteen (18) questions only. **Conclusions:** These results broadly suggest lower levels of interactivity regarding General Embryology lecture classes in the eyes of Bangladeshi medical undergraduates.

**Keywords:** Interactivity, lecture, undergraduate medical students, embryology class.

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## INTRODUCTION

Lectures are the most commonly employed instructional methods in medical education globally. Traditionally, they involve a one-way flow of information, where an instructor delivers content to a large audience of students. Embryology is a vital subject in medical education, helping students understand human development from conception to birth. However, in many Bangladeshi medical colleges, traditional lecture-based teaching often fails to fully engage students due to the abstract nature of the topic. To address this challenge, interactive lectures are gaining popularity as an effective method. By combining visuals, discussions, and student participation, interactive teaching makes complex embryological concepts easier to understand and remember. This approach aligns well with the needs of Bangladeshi students, promoting better engagement and deeper learning in both classroom and clinical settings. According to Rehman, Afzal, and Kamran (2013, p. 152), lectures are a key part of medical education and are simply described as one person talking to a group about a specific topic for a period of time [1].

For the comprehensive understanding of human embryology, traditional lecture is often the only method practiced in medical undergraduate of Bangladesh. So, their learning of Embryology is bound to remain insufficient from didactic lectures.

To make a lecture interactive, lecturers can renew student's activities, generate interest, provide opportunities to think and obtain some feedback of their understanding [2]. If students are engaged in active learning, 'it improves attitude and motivate to learn, which stimulates higher order thinking, problem solving and critical analysis' [3]. Learning is a social construct and the teacher-student relationship appears to be a significant factor in the breadth and depth of student involvement in the learning process' [4]. Interactive lecturing can enhance learning, attention, concentration, which make the learning experience exciting and energetic [5].

The teaching would have been more successful if the lecturer posed the question during the lecture

period and then allowed the students to brainstorm strategies for answering the question before describing the actual topic in that class [6]. By questioning students, they are converted from passive participants to active participants, even if one student does not participate in answering the questions, by using higher cognitive thinking skills they consider answering questions. The process of thinking through and comparing their own answer to that of their peers who act as a form of indirect engagement [7].

It was felt that to bring about meaningful changes in the learning experiences of medical undergraduates from lectures, there needs to be formal investigations into the matter.

## METHODS AND MATERIALS

The research was designed to indirectly evaluate the undergraduates' General Embryology lecture classes of medical colleges, using a survey questionnaire, constructed by the researcher to analyze the perceptions of the Bangladeshi medical undergraduates.

It was conducted after getting approval of the protocol from the Institutional Review Board (IRB) of BSMMU. The research was carried out in the Department of Anatomy, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, from January 2018 to January 2019.

## Inclusion criteria

1. First year medical undergraduates, completing General Embryology lecture classes.
2. Willingness to participate in the survey.

55 closed-ended questions were constructed. All of the questions, the participants (medical undergraduates) were asked to select only one option out of four. As the study was cross sectional Descriptive in design, two medical colleges were selected through convenience sampling of the research. A written permission from the authorities of each institution was taken before conduction of the survey on the undergraduates. All the medical undergraduates of either sex gathered in a lecture class well selected. Introduction and detailed instructions were given to the medical undergraduates regarding conduction of the survey through a PowerPoint presentation. Pre formulated questionnaire were distributed. Medical undergraduates completed their performance within twenty-five minutes. After collecting survey data, answers to the questions were categorized on the basis of different issues. Then frequency of each category was calculated and final results have been presented in tabulated form. Percentage frequency of each question was calculated, then mean score and SD was found by using SPSS, version 23. Results of the survey have been expressed in tabulated form.

## RESULTS

**Table 1: Table shows, medical undergraduates' responses to survey questions regarding how the lecturers try to make their General Embryology lectures 'understandable and interesting'**

Question asked to the undergraduates	Percentage frequency of responses of the medical undergraduates				
	No, almost never (1)	Yes, sometimes (2)	Yes, very often (3)	Yes, almost always (4)	Resulting score (Mean $\pm$ SD)
Do the lecturers repeat important portions of the lecture topics in their lecture?	2.6%	17.7%	38.4%	41.4%	3.19 $\pm$ 0.81
Do the lecturers explain things to the students rather than just providing information?	5.2%	20.7%	38.8%	34.9%	3.03 $\pm$ 0.89
Do the lecturers ask the students to relate one general embryological information or principle with other related information?	19.0%	44.0%	25.0%	10.3%	2.23 $\pm$ 0.93
Do the lecturers share their personal experiences relevant to the lecture topics with the students?	31.9%	49.1%	14.2%	4.7%	1.92 $\pm$ 0.80
Do the lecturers use 'analogies' to make General Embryology issues more understandable?	38.4%	43.5%	14.7%	3.0%	1.81 $\pm$ 0.79
Do the lecturers ask the students to relate general embryological information to their real life experiences?	31.9%	44.4%	15.5%	7.8%	1.98 $\pm$ 0.89
Do the lecturers bring timely social/cultural/ political/ sport events or issues to explain general embryological issues?	58.2%	36.6%	4.7%	0.4%	1.47 $\pm$ 0.61
Do the lecturers use 'mnemonics' (rhymes, abbreviations etc.) to make recall-type general	67.7%	27.6%	4.3%	0.4%	1.38 $\pm$ 0.59

embryological information easier to memorize?					
Do the lecturers ask for probable answers to questions on issues of General Embryology that have not taught yet (i.e., do they practice brain storming)?	42.7%	41.8%	10.8%	4.7%	1.78 ± 0.82
Do the lecturers use unusual materials or innovative methods in demonstrating or explaining general embryological issues in their lectures?	68.1%	25.0%	6.5%	0.4%	1.39 ± 0.62

Table, deals with responses of the undergraduates regarding how the lecturers try to make their lectures ‘understandable and interesting’ by using interactivity. The resulting scores of these responses varied ranging between  $1.38 \pm 0.59$  and  $3.19 \pm 0.81$ . Most of the students (74% to 80%) mentioned that the lecturers repeat important portions of the lecture topics either ‘very often’ (38.4%) or ‘almost always’ (41.4%) and explained things rather than just providing information also either ‘very often’ (38.8%) or ‘almost always’ (34.9%). The mean scores (3.19 and 3.03 respectively) of these issues support those trends. Regarding other issues to make a lecture class ‘understandable and interesting’, the lecturers either ‘almost never’ or ‘sometimes’ used these techniques and the mean scores between 1.38 and 2.23 indicate that trends.

## DISCUSSION

In response to a question regarding the use of mnemonics—such as rhymes or abbreviations—by lecturers to facilitate the memorization of general embryological content, approximately 68% of students indicated that such techniques are “almost never” employed. Ernst and Clothorpe (2007, p. 43) emphasized in their study that incorporating interactive elements into lectures helps break monotony and boost interest, which in turn enhances student attention [8].

In Monzoor et al.’s study (2011, p. 120), 70.4% of students said they would be more willing to attend lectures if the teacher made the lessons interesting. This shows that keeping a lecture engaging helps students stay focused [9]. In this study, students were asked whether lecturers used unusual materials or innovative methods to explain general embryological topics. About 68% responded that this “almost never” happened. On the other hand, Gulpinar and Yegen (2005, p. 591) identified several techniques—such as asking questions, using audience response systems, and incorporating problem-solving exercises—that were employed to encourage active and meaningful learning [10]. Similarly, Bakar and Hasbullah (2018, p. 3 of 6) showed a variety of techniques like participation, engagement in different educational events and found that 80% of basic science lecturers and clinicians agreed about the importance of interactivity in lecture classes [11].

Roopa *et al.*, (2013, p. 2244) observed that, among different techniques, 58.1% students preferred the use of video clipping [12]. In another study, the students showed a preference for the use of combination of visual aids’ (61%), however separately PowerPoint presentation was liked by (31.6%) and blackboard by only (5.9%). Very few students (1.5%) opted for dictating notes [13]. The other authors who also cited and mentioned ‘combination of teaching aids’ and ‘mixed aids’ as the best method for teaching. All those techniques are used by them, suggests that their lecture were easily under stable and interesting. A survey done by Bollmeier, Wenger and Forinash (2010, p. 3) observed that ‘an overwhelming majority of students (86%) stated that they would like more lectures available to the students’ online in future [14]. Lochner *et al.*, (2016, p. 73) reported that in their institution the students seemed pleased with the distribution ratio of 25% online learning to 75% face to face instruction [15]. Another study also noted that students preferred lecturing of theory classes with mix of audiovisual aids (44.76%), with Microsoft PowerPoint (33.33%) with blackboard (18.09%) and overhead projector (3.80%), which made the lecture classes under stable and interesting [16]. Research has shown that learning through storytelling, which approximates real-life experiences in higher education, is a highly reflective activity. It makes lectures more understandable and interesting, and can generate new knowledge and a deeper level of learning [17].

Research showed that learning through storytelling, that approximates real-life experiences in higher education, is a highly reflective learning activity, that makes lecture understandable and interesting, can generate ‘new knowledge’ and ‘deeper level of progress’ [17].

## CONCLUSION

The findings generally indicate that Bangladeshi medical undergraduates perceive a lack of interactivity in most aspects of the General Embryology lecture classes.

### Limitations:

This study included medical undergraduates from only one public and one private medical college in Dhaka city, which may not adequately represent the

entire population of Bangladeshi medical students meeting the specified inclusion criteria.

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