

Original Article

Experiences of Medical Undergraduates about “Interactivity” in General Embryology Lecture Classes- A Cross Sectional Study

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**ABSTRACT**

Background: Anatomy lecture classes of Bangladesh usually follow the traditional, didactic, teacher-centered strategies. It is often suggested that conventional lectures should be replaced by structured sessions with interactive components by preparing lesson plans targeting to design interactive lectures. **Objective:** The purpose of the study was to analyze students' learning experiences how they observe “Interactivity” in General Embryology lecture classes. **Methods and materials:** Two surveys were conducted on 232 undergraduates of two medical colleges of Bangladesh using a questionnaire designed by the researcher to analyze the experiences of the undergraduates regarding different aspects of “interactivity” of their General Embryology lecture classes. **Results:** The survey results of this study regarding the experiences of the medical undergraduates have shown that out of the 55 questions regarding “interactivity”, the Embryology lectures scored three (3) or more scores, out of four (4) in case of only two (2) of the questions. Two (2) or more was scored in case of eighteen (18) questions only. **Conclusion:** These results broadly suggest lower levels of “interactivity” regarding most aspects of the General Embryology lecture classes in the eyes of Bangladeshi medical undergraduates.

Key words: Interactivity, learning materials, nonverbal elements.

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INTRODUCTION

Lecture is one of the most used didactic processes of teaching in medical

institutions around the world. Traditionally, lectures are one-way teaching processes, delivered by a lecturer and received by a

large group of the students. Studies have been shown, lecture is a staple of medical education and is best defined as one person speaking, more or less continuously, to a group of people on a particular subject or theme. It is placed in the course time table where students are taught in a designated space (lecture theatre/lecture room) where one lecturer has the prime responsibility for delivering the content to a large group of students ^[1]. In such classical didactic lectures, students are frequently seen as passive recipients of information, without much engagement in the learning process, and therefore their attention falls quickly after 15 to 25 minutes. In this context, the question of ‘interaction’ has come up. Interaction is a powerful and simple tool which has the capacity to engage all students in the teaching session ^[1]. When conventional lectures in large classrooms confront fundamental didactic problems due to a lack of ‘interactivity’ and feedback opportunities, at that case an ‘interactive lecture’ is the one in which knowledge is imparted to students by involvement in the form of questions and answers ^[2].

According to the latest version of the 1st professional medical undergraduate curriculum of Bangladesh, updated in 2012, students have to attend 115 hours of Anatomy lecture classes. Among which General Embryology lecture classes are allotted for only 18 hours ^[3]. As Embryology is one of the most important parts of Anatomy, students must attend that and they want to remember most of the things about lectures, what their teachers say in the classroom. It is obvious that learning outcome is greatly dependent on the understanding of General Embryology lectures by medical undergraduates. So, their learning of Embryology is bound to remain insufficient from didactic lectures.

A large number of reasons have been identified for the medical students’ disinterest in lectures ^[4]. On the other hand, the influencing factors on attending a

lecture have been identified as ‘friendly attitude of the teacher’, ‘good control on class’, ‘punctuality’, ‘sense of humor’, ‘capacity of being internal examiner’, and ‘humane behavior’ ^[5]. Lecturers can sometimes interpret students’ body languages and adjust teaching styles or the progress of the class to ensure student’s understanding ^[6]. ‘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’ ^[7]. Authors explained in their studies, “interactive lecturing can enhance learning, attention, concentration, which make the learning experience exciting and energetic” ^[8].

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. Such systematic studies encompass the angles of what the present situation is with the practice of interaction in the lecture classes, what the medical undergraduates of Bangladesh feel about and experience in the current General Embryology lecture environments regarding the ‘interactivity’.

The main disadvantages of traditional lectures is the lack of ‘interactivity’, which is characterized by the situations in which a teacher presents new information to the learners without guiding their learning processes ^[9]. Authors have used specific languages, in describing the utility of interactive lecture: ‘Interactive lecturing lightens the lecture atmosphere, helps students overcome their fear of a subject, addresses common misconceptions held by students, allows the more-challenged students to follow the lines of argument’ ^[10]. Thus, it keeps the students engaged and develop confidence in their own learning ability’. A survey on the undergraduate medical students of all five years in a medical college of Pakistan revealed that more than 70% of the respondents thought

that ‘good communication’ by the teachers’ is a significant feature in their decision to attend lectures [5]. Educational research has shown that students who are actively involved in the learning activity will learn more than students who are passive recipients of knowledge [11].

METHODS AND MATERIALS

The research was cross-sectional descriptive in nature. A questionnaire-based surveys were conducted in two Bangladeshi medical colleges for analyzing the experiences of the undergraduates regarding “Interactivity” in their General Embryology lecture classes. The research was carried out in the Department of Anatomy, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, from January 2018 to January 2019.

During survey, introduction and detailed instructions were given to the medical undergraduates regarding conduction of the survey through a PowerPoint presentation. Pre formulated questionnaire were distributed among 232 medical undergraduates who were performed as sample. The survey questionnaire containing 55 closed-ended questions on which they answered. All of the questions, the participants (medical undergraduates) were asked to select only one option out of four. Then answer scripts were collected.

Inclusion criteria

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

Study plan of the research:

Study plan of the research is shown as a flow chart in the Figure 1:

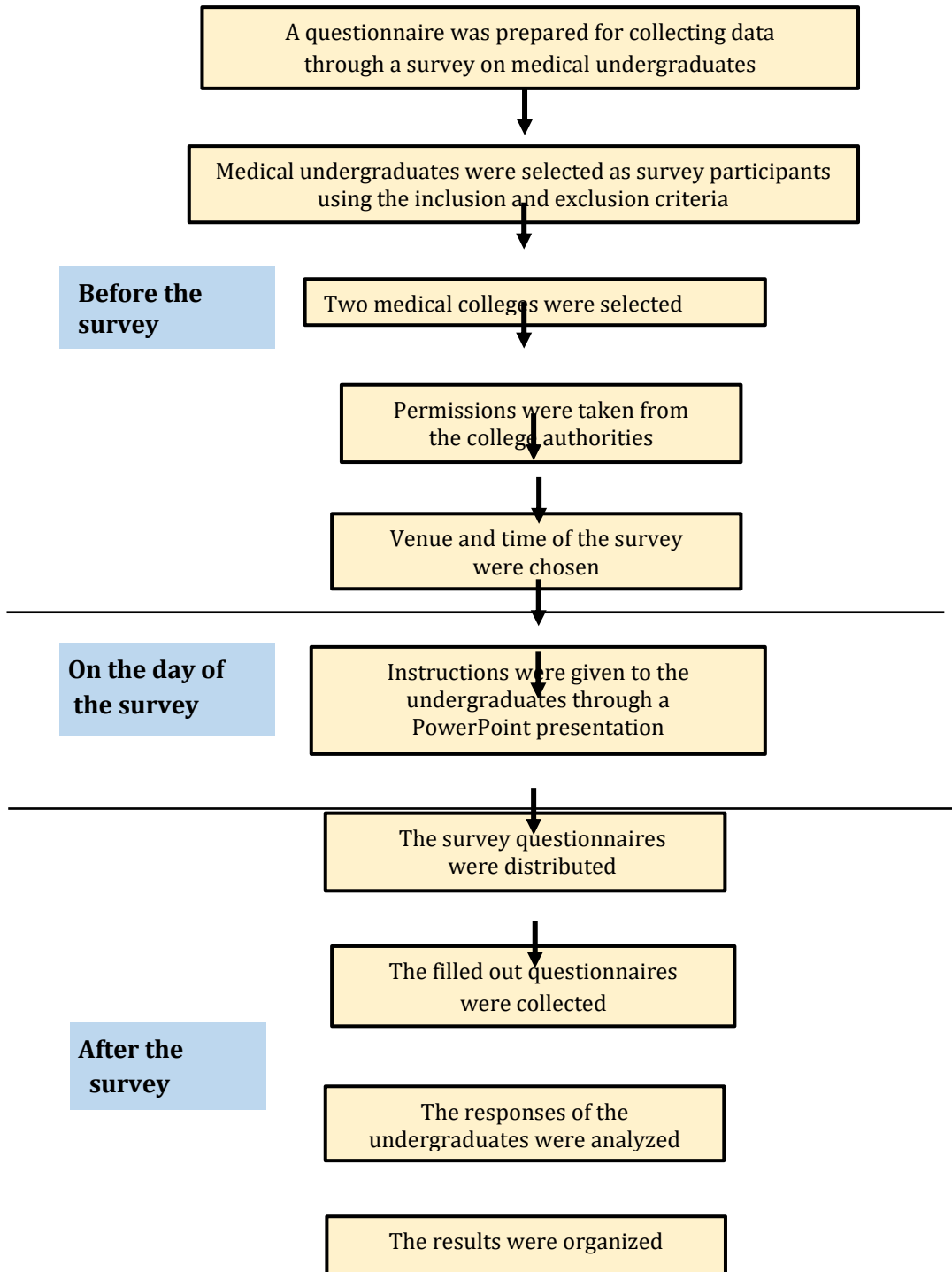


Figure 1: Study plan of the research to show the sequence of events

RESULTS

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 Survey questions were categorized in to following issues:

1. Types of “learning materials” used by the lecturer
2. Use of “nonverbal elements” in the lecture classes

Table I deals with the responses of the undergraduates regarding what types of ‘learning materials’ are used by the lecturers in their lecture classes and how. The resulting scores of these responses did not vary much, which ranged between 1.21 ± 0.49 and 2.34 ± 0.86 . Around half of the students mentioned that ‘sometimes’ the texts shown on the board /screen were easy to read, follow and remember (40%), the figures shown were easy to see, interesting and eye-catching (47%) and lecturers drew figures themselves on board in front of the class (52%).

the survey have been expressed in tabulated form.

Almost all undergraduates (82% to 92%) noticed that the lecturers either ‘almost never’ or ‘sometimes’ used animations or video clips relevant to the lecture topics for better understanding the topic. On the other hand, the undergraduates mentioned that they ‘almost never’ got any handout before, during or after the classes (82%); the lecturers ‘almost never’ provided handouts that contained spaces for taking notes (85%) and the lecture materials were ‘almost never’ available to the students online (80%). The mean scores (1.2, 1.2 and 1.3 respectively) regarding these issues support the trends. The students observed either ‘sometimes’ (45%) or ‘very often’ (29%) lecturers gave them some time to take notes but they were ‘almost never’ (50%) allowed to take photographs from the lectures.

Table I: Medical undergraduates responses to survey questions regarding what types of ‘learning materials’ are used by the lecturers in their lecture classes and how

Question asked to the undergraduates	Percentage frequency of responses of the medical undergraduates				Resulting score (Mean \pm SD)
	No, almost never (1)	Yes, sometimes (2)	Yes, very often (3)	Yes, almost always (4)	
Are the texts shown on the board/screen during the lectures easy to read, follow and remember?	20.7%	39.7%	25.0%	14.2%	2.32 \pm 0.97
Are the figures shown on the board/screen during the lectures relevant, easy to see, interesting and eye-catching?	15.1%	47.0%	26.7%	11.2%	2.34 \pm 0.86
Do the lecturers draw general embryological figures themselves on the board/OHP transparencies/others in front of the class?	12.9%	51.7%	25.0%	10.3%	2.33 \pm 0.83
Do the lecturers use animations in their visual presentations in such ways that the topics become easier to understand?	41.4%	42.2%	13.4%	3.0%	1.78 \pm 0.78
Do the lecturers use short video clips relevant to the lecture topics?	68.5%	22.8%	6.9%	1.7%	1.42 \pm 0.49
Do the lecturers give any handout before, during or after the lecture classes?	82.3%	15.5%	1.3%	0.9%	1.21 \pm 0.49
Do the lecturers give the students some time to take notes of their lectures?	16.8%	45.3%	29.3%	8.6%	2.3 \pm 0.84

Do the lecturers provide handouts that contain copies of their slides and spaces against the slides for taking lecture notes?	85.3%	8.6%	4.3%	1.7%	1.22 ± 0.60
Do the lecturers make their lecture material or related materials available to the students online?	79.7%	13.4%	5.6%	1.3%	1.28 ± 0.62
Do the lecturers allow students to take photographs with mobile phones for doing homework on specific concepts from the class?	50.0%	20.7%	15.1%	14.2%	1.94 ± 1.10

n, number of medical undergraduate students responding to each question = 232
The numbers within parentheses depict the scores allotted to the response types

Table II deals with responses of the undergraduates regarding how the lecturers use ‘nonverbal elements’ in their lecture classes. The resulting scores of these responses did not vary much and were ranging between 1.69 ± 0.79 and 2.32 ± 1.06 . Almost half of the students noticed that the lecturers ‘sometimes’ used appropriate body postures and gestures (50%) and kept their face smiling (43%).

On the issue of lecturers’ communication with the students personally through direct eye contact during classes, the students’ observation varied from ‘no, almost never’ (20%) to ‘yes, almost always’ (16.4%). On the other hand about 80% undergraduates observed that the lecturers ‘almost never’ (48%) or ‘sometimes’ (36%) walked through the students’ columns to come to the students.

Table II: Medical undergraduates’ responses to survey questions regarding how the lecturers use ‘nonverbal elements’ in their General Embryology lecture classes

Question asked to the undergraduates	Percentage frequency of responses of the medical undergraduates				Resulting score (Mean ± SD)
	No, almost never (1)	Yes, sometimes (2)	Yes, very often (3)	Yes, almost always (4)	
Do the lecturers use appropriate body postures and gestures to communicate their messages effectively?	19.4%	50.0%	25.0%	5.6%	2.17 ± 0.80
Do the lecturers keep a smiling face in the classes?	18.1%	45.3%	23.3%	12.1%	2.27 ± 0.93
Do the lecturers communicate to you personally through direct eye contact during the classes rather than through a vague look at the whole class?	20.3%	34.9%	25.4%	16.4%	2.32 ± 1.06
Do the lecturers walk through the students’ columns to come close to the students when they teach?	48.3%	35.8%	12.9%	2.6%	1.69 ± 0.79

n, number of medical undergraduate students responding to each question = 232
The numbers within parentheses depict the scores allotted to the response types

Table III has shown some examples of how the lecturers take various approaches in engaging undergraduates with different ‘learning styles’ in their General Embryology lecture classes.

Table III: Examples of how the lecturers take various approaches in engaging undergraduates with different ‘learning styles’ in their General Embryology lecture classes

Approach taken by lecturers	Learner type based on learning style
<ul style="list-style-type: none"> - Using good quality figures - Drawing figures themselves - Asking questions on shown figures - Using animations - Using video clips 	<ul style="list-style-type: none"> - Visual learner
<ul style="list-style-type: none"> - Asking questions to the students or allow them to ask questions - Repeating important portions of the lectures - Using video clips 	<ul style="list-style-type: none"> - Auditory learner
<ul style="list-style-type: none"> - Calling students to the stage to say, show or do something - Asking volunteers to fill in the gaps in figures drawn on the board - Making the whole class to do some activities - Arranging role playing by the students 	<ul style="list-style-type: none"> - Tactile learner

DISCUSSION

The aim of the present research was to analyze the present situation of ‘interactivity’ in General Embryology lecture classes, from medical undergraduates’ perspective, through a survey. The overall assessment from the survey showed that the undergraduates were not incorporated in to ‘interactivity’ in their lecture classes, up to their expectations. In a study, author has found from his research work that the teaching method of didactic lectures have many lacunae and needs to be modify ^[12].

In the present study, for the questions regarding ‘interactivity’ in the ‘types of learning materials used by the lecturers in the General Embryology lecture classes’, the mean score of the undergraduates’

response varied between 1.21 ± 0.49 and 2.34 ± 0.86 , and for only four out of ten questions, the score was more than 2. Almost all undergraduates (82% to 92%) noticed that the lecturers either ‘almost never’ or only ‘sometimes’ used animations or video clips relevant to the lecture topic for making the topic better understanding. A video-based clinical anatomy interactive lecture was held in a study where students were benefited as evident from the higher post-test score of the study group was significantly higher as compared to that in the control group of students who were only exposed to traditional gross anatomy lectures ^[13]. Some researchers observed that among different techniques, the students (58.1%) preferred the use of video clipping ^[14]. 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^[15]. The other authors who also cited and mentioned 'combination of teaching aids' and 'mixed aids' as the best method for teaching. In the present study the medical undergraduates mentioned that they 'almost never' got any handout before, during or after the classes (82%) and the lecture materials were 'almost never' available to the students online (80%). But a survey done by some researchers, observed that 'an overwhelming majority of students (86%) stated that they would like more lectures available to the students' online in future'^[6]. Some authors reported that in their institution the students seemed pleased with the distribution ratio of 25% online learning to 75% face to face instruction^[16]. Another study, authors 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%)^[17].

Regarding the use of 'non-verbal elements' in General Embryology lecture classes, the mean score in the present study was less than 3. However, for three out of four questions the score was more than 2. Almost half of the students noticed that the

lecturers 'sometimes' used appropriate body postures and gestures (50%) and kept their face smiling (43%). On the issue of lecturers' communication with the students personally through direct eye contact during classes, the students' observation varied from 'no, almost never' (20%) to 'yes, almost always' (16.4%). About 85% undergraduates observed that the lecturers 'almost never' (48%) or 'sometimes' (36%) walked through the students' columns to come to the students. Actually, teaching during lectures is a special form of communication in which, gesture, movement, facial expression, and eye contact can either complement or detract from the content^[1]. In a study researchers found that, 65.8% students mentioned about the friendly attitude and 44% students mentioned about the humane behavior of lecturers can increase interest in lecture classes^[5].

CONCLUSION

The results broadly suggest lower levels of 'interactivity' regarding most aspects of the General Embryology lecture classes in the eyes of Bangladeshi medical undergraduates. Ways of infusing and improving interactivity into the planning of lectures should be explored through systematic research for ensuring evidence based designing of training modules for teachers.

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