

Multimodal Anatomy Teaching Pedagogy: Student's Perception for Effective Teaching of Anatomy Curriculum

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ABSTRACT

Objective: There is still much disagreement over the most effective way to teach anatomy. This article has discussed the benefits of these instructional strategies. Nowadays, teaching anatomy primarily involves PowerPoint presentations. As a result, the following article discusses the numerous teaching approaches and students' input and suggestion in making anatomy lectures more interesting and easy. The purpose of this study was to ascertain whether the multimodal anatomy teaching methodology currently in use is viewed favorably and to identify the specific modalities that were considered to be most successful.

Material and Methods: It was a cross-sectional study conducted in two steps. Step one was carried out by distributing 250 questionnaires out of which 192 students participated by filling the questionnaires. The second step was dividing a class of 2ND year MBBS students into 3 groups where group A was given a lecture in a teacher-centered manner, Group B was student-centered and Group C was a combination. Assessment was conducted at the end of the lecture and data was analyzed using SPSS version 20.

Results: Students thought each way of teaching and learning is important but the best way of teaching was a multimodal teaching pedagogy. 93% thought that using a power point presentation with the use of white board teaching is the best method of teaching. Similarly, the results of the assessment showed that the teacher-student interactive approach produced the highest mean score (mean=1.87), followed by the student-centered approach (mean=1.79), and the lowest mean score (mean=1.36) was recorded for the teacher-centered approach, according to the estimated marginal mean estimates based on the teaching method used. All three instructional approaches' average estimates are within the 95% confidence intervals. The findings show that the most successful method for getting the highest test scores is a combination of teacher-centered and student-centered teaching techniques. This demonstrated that rather than the lecturer monopolizing the transfer of information to the learners, interaction between the teacher and students during the teaching and learning process motivates the students to seek knowledge. The student-centered approach's predicted mean score (mean=1.79) was slightly lower than the teacher-student interactive approach's. This suggests that using student-centered strategies is a successful teaching strategy. When compared to student-centered and teacher-student interactive techniques, the results of adopting teacher-centered strategies were significantly lower (mean=1.36). The most successful strategy to teach basic anatomy is to use a variety of pedagogical educational materials; students seem to learn more quickly and effectively when using multimodal and system-based strategies. Future research should focus on evaluating the applicability of new curricula and student views of integrated and multimodal teaching paradigms as well as these paradigms' capacity to meet learning objectives.

Conclusion: In order to determine the general level of the learner characteristics, learner analysis is a crucial stage. This study offers recommendations on how to create instructional objectives and choose the best ways to accomplish them. The findings of this study can be used to create educational plans and choose efficient anatomy teaching techniques.

Keywords: Multimodal, Large group discussion, small group discussion, mini seminar, integration

INTRODUCTION

Anatomy curricula deal with an unusual problem in that it consistently serves as a foundation course for students in Medical, Dental and Health Sciences related fields(1). Human Anatomy is the cornerstone of medicine; comprehending the complexity of the human body is required to become a successful doctor(2). Overhead projector, PowerPoint presentations, and 3D models have all advanced the chalkboard technique of teaching and learning anatomy(3). Modern teachers use a variety of cutting-edge tools to help their students learn in addition to teaching them. The introduction of these contemporary educational technologies is not entirely new; these modalities are already in use, but in the current environment, their significance has expanded dramatically(4). As a result, anatomy teachers need to stay current with emerging technology in medical education. The way that students learn has also changed significantly throughout time; they no longer only rely on textbooks to do so(5).

Teaching and learning have become more difficult as a result of the growth in class size and the decline in student engagement in classroom learning(6). Numerous studies in recent years have revealed that graduates of medical and dentistry schools have inadequate anatomical understanding(7-9). Given the increasing rise in suing and ethical misconduct for surgical negligence, such a deficit undoubtedly affects the safety of medical practice. Student's perception and input is necessary to know

which method of teaching would help them learn, understand and retain anatomy syllabus more effectively(10,11).

Anatomy has been an essential component of the medical curriculum for countless years. Traditionally, didactic lectures have been the only methods of teaching gross anatomy(5,12). Changes in the teaching of gross anatomy have frequently included reduced student contact time as well as the introduction of novel teaching approaches(3). A thorough understanding of anatomy is essential for effectively comprehending any other discipline of medicine. The use of PowerPoint presentations in classroom instruction has significantly increased for medical education(13). The learning was enhanced by the use of various instructional techniques, including the conventional chalk and board approach, the dissection method, power point presentations, and ultrasound imaging(14). But not much has been done to know what students think about these strategies of teaching and if multimodal anatomy teaching is indeed the best way to learn anatomy(3,13). The purpose of this study was to evaluate whether the present multimodal anatomy teaching style is perceived positively, and which specific modalities were determined to be most helpful.

MATERIAL AND METHODS

It was a cross-sectional study. A structured questionnaire was used as the main research tool to gather information, carry out the investigation, and evaluate student perspective. The survey was

conducted on paper and was a modified version of a previously validated and trustworthy instrument adopted from (15) for gauging students' opinions of various teaching techniques. Six teaching approaches for teaching anatomy to students were all investigated in this study as well as system-based methods are combined. 250 questionnaires were distributed among dental and MBBS students 192 participants responded.

The questionnaire had general questions asked by the students about the different methods of teaching anatomy curriculum. To test this further, a small easy topic from anatomy was chosen, 109 students of 2nd year MBBS class were divided in to 3 groups. Group A was taught in a teacher based method was used (LGF), group B was taught in a student center manner (SGF) and the group C was taught in a teacher-student interactive method and evaluation of knowledge was done using MCQS type standardized test after the class was over. SPSS version 20 was used to analyze the data.

RESULTS

250 questionnaires were distributed among dental and medical students, 192 responded back. The questionnaire was based on simple yes no answers.

Table 1: demonstrates the perspective of dental and medical students about the different methods of teaching

Serial #	The usefulness of different methods of teaching	Yes	No
1	LGF	75%	25%
2	SGF	65%	35%
3	MINI-SEMINAR	70%	30%
4	PRACTICALS/ LABORTORY	82%	18%
5	POWERPOINT PRESENTATIONS	60%	40%
6	USE OF WHITE BOARD	79%	21%
7	USE OF POWER POINT PRESENTATIONS WITH WHITE BOARD	93%	7%

All different forms of lectures are delivered to the students hence they are the ones to decide which method is better suited to learn anatomy. According to the present study, use of whiteboard and power point presentation both together is the most effective way of teaching. This method is comparatively more interactive than a conventional long group discussion format (LGF) and both teacher and student centered unlike small group discussion format (SGF) which is student centered only.

A test was prepared by the lecturer and all participating 109 students were given the same test to take, the outcome variable was the students' performance in the assessment that was conducted in the end of teaching the same topic with the three methods of teaching, at the end of the class. Data was analyzed using descriptive statistics. From the sample of 109, (77.1%) were females and (22.9%) were male students In the high, moderate, and low band categories of the performance assessment test results for learners, 30.3% (n = 33), 67.0% (n = 73), and 2.8% (n = 3) were found, respectively, to be in the low, moderate, and high classes. The test results were categorized as follows: high (75-100%), moderate (50-74%), and low (0-49%).

Table 2: shows the result after each method was used to teach the same topic

Performance Assessment Test Scores Based On Teaching Method:	Estimated Mean	Standard Deviation	95%Confidence Interval
Teacher-Student Interactive(n=46)	1.87	0.499	1.733 -2.007
Teacher-Centered (n=25)	1.36	0.490	1.174 -1.546
Student-Centered (n=38)	1.79	0.413	1.639- 1.940

The teacher-student interactive approach produced the highest mean score (mean=1.87), followed by the student-centered approach (mean=1.79), and the lowest mean score

(mean=1.36) was recorded for the teacher-centered approach, according to the estimated marginal mean estimates based on the teaching method used. All three instructional approaches' average estimates are within the 95% confidence intervals. The findings show that the most successful method for getting the highest test scores is a combination of teacher-centered and student-centered teaching techniques. This demonstrated that rather than the lecturer monopolizing the transfer of information to the learners, interaction between the teacher and students during the teaching and learning process motivates the students to seek knowledge. The student-centered approach's predicted mean score (mean=1.79) was slightly lower than the teacher-student interactive approach's. This suggests that using student-centered strategies is a successful teaching strategy. When compared to student-centered and teacher-student interactive techniques, the results of adopting teacher-centered strategies were significantly lower (mean=1.36).

DISCUSSION

Given the dynamic and ever-changing nature of health and medical education, instructors can reap significant benefits by incorporating multimodal digital learning into their courses(16). Because health and medical education are dynamic and ever-evolving fields, educators can gain a lot by incorporating multimodal digital learning into their courses(17).

This study focused on how students perceive different teaching methods. The present research found that no single strategy completely met all of the teaching goals. This study confirmed that a multimodal approach to teaching is the best for a variety of reasons. The primary element that contributed to student variability in terms of educational background and, consequently, learning styles was the diversity of their backgrounds. This result is consistent with Christain et al.'s results (11)that students gain more from a multimodal approach that prioritizes developing useful skills and knowledge above factual memory. These many teaching techniques aid in creating an independent, encouraging environment.

Considering health and medical education are dynamic and ever-evolving fields, educators can gain a lot by incorporating multimodal digital learning into their courses(18). In our research 93% students considered interactive sessions between students and the teacher to be the best way of communication and learning strategy. Similarly a research carried out by Nousheen et al. in 2021(19), students were given conceptual understanding of related fields through multimodal clinical teaching in the anatomy lab, which also helped them to better understand contextual clinical-anatomical ideas. Over 90% of students said the integrated anatomy labs improved their learning. Students worked effectively in their teams and developed their social skills in the laid-back, active learning lab setting.

After evaluating the assessment results of the same lecture delivered in three different methods, students performed the best in the teacher-student centered strategy of teaching. This was in line with a review published by Abu Bakar et al. (20)in 2022 that clearly stated that using multimodal approach to teach produced the best results.

CONCLUSION

Many anatomists endorse the use of a multimodal paradigm for teaching anatomy. The value of utilizing various teaching methods and their enormous impact on learning has never been in question. Since adult learners tend to engage more readily when aims and relevance are obvious, lecturers should explain the justification for using various instructional strategies. This would be a constructive step in modernizing the learning environment and creating a more engaging anatomy education.

The learning of the students is greatly impacted by these various instructional methods. Supporting autonomy, competence, and relatedness, the key components of self-determination theory

it promotes internal drive. The integration of many system-based modalities appears to benefit students the greatest.

Limitations: Although this study's findings have provided some insight into how students view the teaching of anatomy, further work needs to be done to identify some of the variables that affect students' impressions and the sample size was comparatively small.

Conflict of interest: The authors declare that they have no conflict of interest.

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