

## Preferred Instructional Strategies for Gross Anatomy - A Student Perspective

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### ABSTRACT

Anatomy is a basic medical subject whose conceptual understanding and knowledge is cornerstone in rest of medical teaching. Traditional anatomy teaching had involved board and chalk lectures, power point presentations, and small group demonstration classes with the help of dissection, prosection and audiovisual tools. Most of the traditional teaching focused on teacher centered approach of delivering information in one way traffic with student being the passive recipients of knowledge. With the paradigm shift of teaching-learning toward student centered approach it is imperative to take into consideration the students perspectives on the various teaching –learning strategies that are used in our medical schools. The present study was based on questionnaire survey conducted among the students of first year MBBS, First year BDS and second year MBBS at the end of their anatomy course .Students opinion was taken regarding the various combinations of teaching anatomy that was practiced in the medical college involving demonstration with the help of audiovisual tools, dissection/prosection and self-study in a variety of sequences. Total of 350 students were given survey forms and 255 responded. Majority preferred the teaching strategy involving demonstration self-study dissection/prosection (70.5%) The second option was self-study demonstration →dissection/prosection (20%) and third option taken by least number of students was demonstration→dissection/prosection self-study (8.6%). We concluded that undergraduate students preferred to be brainstormed about the topic of study by demonstration class with audiovisual help followed by a self-study time from textbooks or web sources which was followed by hands on dissection or prosection in order to get better knowledge and understanding of the subject.

**Keywords:** Gross anatomy, traditional anatomy, learning

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### INTRODUCTION

Anatomy is the basic knowledge domain that has served as foundation for almost all clinical subjects of medicine. Anatomy education is taken as a cornerstone that is a must have prerequisite for all the health care professionals and that is why it occupies a pivotal place in the medical curricular discussions .

There is no doubt that the comprehensive knowledge of anatomy is a primary requirement for the proper understanding of other branches of Medical curricula and thus ensuring safe medical care delivery to the consumers<sup>2</sup>.

Traditional gross anatomy class rooms make use of chalk and board as the main teaching tool where teacher writes down keywords on the blackboard and draws relevant diagrams. Recently power point presentation has replaced chalk and board to a large extent with an added advantage of being more attractive<sup>3</sup>.

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Typically gross anatomy demonstration at medical school involves 20-30 students around the anatomical tables in dissection halls, where the teacher demonstrates on the cadavers. Dissection method gives a clear concept of the anatomical structures and enhances the surgical skills of the learners later on with good memory of anatomical relations of various organs<sup>4</sup>.

Dissection gives more comprehensive three dimensional image of the different anatomical regions of the body, but it requires supervision by surgeons and demonstrators. Dissection is an undeniable aspect of traditional anatomy teaching; however, it requires self-directed learning as well as the learner can explore at his own pace and area of interest<sup>5</sup>.

For many many years, cadaveric dissection had been the best means for teaching/learning anatomy to undergraduate students until more recently, due to difficulty in the availability of cadavers, the use of prosection is becoming increasingly common as an alternate to dissection as teaching tool for anatomy<sup>6,7</sup>. Though cadaver dissection is proven to be highly effective in developing and retaining anatomy concepts by evidence based studies<sup>8</sup>.

In modern era, plastic models, prosections, plastination, computer assisted learning tools etc. has

taken place of long hours spent during anatomy dissections.<sup>9</sup> The teaching methodologies and tools used is governed largely by the resources and distinct educational policies implemented by individual institutions<sup>10</sup>.

In order to make more effective use of the available sources without a compromise on the understanding of anatomy, the pros and cons of various teaching methodologies are being reassessed with a view to make it a more efficient learning experience.<sup>11</sup> Virtual anatomy softwares and imaging has definitely replaced the use of cadavers to a considerable extent and at other places the same is taken up by prosections or plastinated specimens.<sup>12</sup> Plastination, is a method of preserving prosected specimens in a medium that is odorless and keeps them safe for longer periods of time, thereby making up for the scarcity of cadavers as well as the time consumed for dissection. Some of such approaches haven't compromised the students satisfaction and knowledge level<sup>13</sup>.

Computer-assisted learning has changed the face of learning as a general phenomenon and in particular the medical learning. Various online learning programmes like black board and quizzes improve the self-directed, self-paced and self-assessed learning experiences. Information retrieval from online resources is also conducive to long-term retention of knowledge<sup>14</sup>.

With the availability of diverse means and tools of teaching, the choice for the best instructional method is much debated around the globe. Anatomy being the foundation for rest of medical sciences is particularly challenged by this dogma. To make instructional changes for the paradigm shift from teacher-centered toward student-centered instructional environment, it is imperative to take the students, the ultimate beneficiaries of the teaching – learning process, on board while designing the instructional strategies for medical schools. To ensure that the learning environment is more conducive towards the conceptual understanding and logical reasoning rather than memorization and reproduction of the facts, students view point should be given due importance while designing the medical curricula<sup>15</sup>.

In order to have student's perspective about the best instructional modalities that is helpful in learning gross anatomy the current study was carried out at CMH medical college Lahore at the end of year 2014-15 course of gross anatomy.

## METHOD

Survey forms with three commonly used teaching strategies practiced at the college were distributed

among 300 students of second year MBBS, First year MBBS and first year BDS at the end of their one year session of gross anatomy course. The students were asked to choose one best option out of three given options as follows:

Q. Which of the following modes of teaching gross anatomy you find the best:

A) Self-study followed by → demonstration → dissection/ prosection

B) Demonstration followed by → Self-study → dissection/prosection

C) Only demonstration followed by → dissection/prosection

## RESULTS

Out of 300 students, 255 responded the survey forms. Out of 255, 180 students (70%) preferred the option B, 53 (20%) preferred option A and only 22 students (8%) preferred option C. So most of the students were of the opinion that after a demonstration class, which in our setup is assisted by interactive audiovisual atlases, should be followed by some self-study before embarking upon the dissection or prosection.

## DISCUSSION

There is a continuing dialogue between traditional educators and those who favour more innovative learning practices. Student-centered approaches are believed to undermine the significance and compromise the time allocated for anatomy teaching<sup>5</sup>. In contrast, non-traditional educators strongly favour the adoption of student-centered approaches which must play an integral part in setting the anatomy education as the foundation for the rest of a student's medical education<sup>16</sup>. Lot of research has been on the incorporation of new teaching modalities but only those involving student-centered teaching has shown additional learning benefits to students. In student-centered, modern learning approaches like constructivism, Instructor acknowledges students' prior knowledge of the subject, especially the student's perceptions and preferences about how to learn a particular subject<sup>17</sup>.

Most of studies in medical education have been focusing on the explanation of different teaching and learning methodologies rather than attempting to describe the student learners and their ideas and perceptions of their medical training in their academic setting<sup>18</sup>.

In traditional anatomy classrooms, rote memorization has long been considered as the primary method of learning<sup>19</sup>. In order to shift anatomy teaching beyond traditional anatomy

classrooms to a more student-centered environment, where students are involved to get better grasp of the concepts of subject by using deeper and proactive approaches to learning rather than relying on traditional means of memorization and practice. This paradigm shift requires a clear understanding of student's concept of learning anatomy which needs reflection by the student as well as the instructor about the process of learning<sup>20</sup>.

Introduction of the concept of vertical integration across basic and clinical subjects during medical school teaching has once again raised the concern of traditional anatomy educators about the reduction of formal teaching hours for anatomy. Moreover, there is rising concern that future clinicians will have a smaller knowledge base about core anatomy due to reduction in the time supposed to be spent on anatomical dissection as alternate means are being used for learning anatomy<sup>21</sup>.

Due to vertical integration the students are often examined regarding their knowledge of anatomy as perceived by clinicians which supports the view taken by some writers as if the time spent in anatomy dissection rooms was invaluable. So incorporation of more clinically relevant anatomy in the medical curricula is strongly suggested by clinicians to vertically integrate anatomy education<sup>22</sup>. Both of these educational experiences are seen as contradiction to traditional anatomy education by some educators.

Traditional or innovative, whatever is the teaching or instructional tool it should be adapted to the learners' needs and keeping our restraint in resources in mind, we should modulate the traditional teaching to meet the expectations of the students in order to encourage their active involvement in the process of learning.

Our study suggested that students value both dissection and prosection as effective tool in learning gross anatomy after they have had the demonstration lecture by their teacher and followed by self-reading of the same concepts then they were able to better identify the anatomical structure and understand the relative anatomical relations logically. We are planning to incorporate the same instructional strategy for the next coming session with some possible horizontal integration among the basic sciences and vision for more vertical integration with adoption of modular system in the coming years.

## REFERENCE

1. Hildebrandt, S. Lessons to be learned from the history of anatomical teaching in the United States: the example of the University of Michigan. *AnatSciEduc* 2010;3:202-12.

2. Elizondo-Omana, R., Guzman-Lopez, S., & Garcia-Rodriguez Mde, L. Dissection as a teaching tool: past, present, and future. *Anatomical Record. Part B, New Anatomist*, 2005; 285(1), 11-15.
3. Benly, P. Teaching Methodologies on Anatomy- A Review. *J. Pharm. Sci. & Res.* 2014; Vol. 6(6), 242-243.
4. Aversi-ferreira, T.A., Monteiro, C.A., Maia, F.A. et al. Neurophysiology study associated with three-dimensional models constructed during the learning. *Bioscience Journal*, 2008; vol. 24, no. 1, p. 98-103.
5. Snelling, J., Sahai A., Ellis, H. Attitudes of medical and dental students to dissection. *Clin Anat.* 2003;16:165-72. [Pub Med].
6. McLachlan, C. "New path for teaching anatomy: living anatomy and medical imaging versus dissection," *Anatomical Record B*, 2004; vol. 281, no. 1, pp. 4-5.
7. Winkelmann, A. "Anatomical dissection as a teaching method in medical school: a review of the evidence," *Medical Education*, 2007; vol. 41, no. 1, pp. 15-22.
8. Hasan, T., Ageely, H. and Hasan, D. The role of traditional dissection in medical education, *Education in Medicine Journal*, 2010; Vol. 2 (1): e30-e34.
9. Nicholson, D.T., Chalk, C., Funnell, W.R., Daniel, S.J. Can virtual reality improve anatomy education? A randomized controlled study of a computer-generated three-dimensional anatomical ear model. *Med Educ.* 2006; 40(11): 1081-7.
10. Rizzolo, L.J., Stewart, W.B. Should we continue teaching anatomy by dissection when? *Anat Rec B New Anat* 2006; 289: 215-8.
11. Sugand, K., Abrahams, P., Khurana, A. The anatomy of anatomy: a review for its modernization. *AnatSci Educ.* 2010; 3(2): 83-93.
12. Durham JA, Brettell S, Summerside C, McHanwell S. Evaluation of a virtual anatomy course for clinical undergraduates. *Eur J Dent Educ* 2009; 13:100-9.
13. Fruhstorfer, B.H., Palmer, J., Brydges S, Abrahams, P.H. The use of plastinated prosections for teaching anatomy: the view of medical students on the value of this learning resource. *Clin Anat* 2011; 24:246.
14. Pyle, M.A., Andrieu, S.C., Chadwick, D.G., Chmar, J.E., Cole, J.E., George, M.C., et al. The case for change in dental education. *J Dent Educ* 2006; 70(9): 921-4.
15. Drake R.L., McBride J.M., Lachman N, Pawlina W. Medical education in the anatomical sciences: the winds of change continue to blow. *AnatSciEduc* 2009; 2:253-9.
16. Terrell, M. Anatomy of learning: instructional design principles for the anatomical sciences. *Anatomical Record*. 2006; Part B, *New Anatomist*, 289(6), 252-60.
17. Windschitl, M. Framing constructivism in practice as the negotiation of dilemmas: An analysis of the conceptual, pedagogical, cultural, and political challenges facing teachers. *Review of Educational Research*, 2002; 72(2), 131.
18. Miller, S. A., Perrotti, W., Silverthorn, D. U., Dalley, A. F., & Rarey, K. E. From college to clinic: reasoning over memorization is key for understanding anatomy. *The Anatomical Record*, 2002; 269(2), 69-80.
19. Pandey, P., & Zimitat, C. Medical students' learning of anatomy: memorisation, understanding and visualisation. *Medical Education*, 2007; 41(1), 7-14.
20. Aziz, M. A., McKenzie, J. C., Wilson, J. S., Cowie, R. J. The human cadaver in the age of biomedical informatics. *The Anatomical Record*, 2002; 269(1), 20.
21. Staskiewicz, G., Walczak, E., Torres, K., Torres, A., Mazgaj, M., Kostek, H., et al. What do clinicians think of the anatomical knowledge of medical students? Results of a survey. *Folia Morphol*, 2007; 66(2), 138.
22. Waterston, S., & Stewart, I. Survey of clinicians' attitudes to the anatomical teaching and knowledge of medical students. *Clin Anat*, 2005; 18(5), 380-384.

