

## Role of participatory learning by demonstration on prosected parts by 1<sup>st</sup> MBBS students in addition to traditional dissection in medical education

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### Abstract

With declining hours devoted to 1<sup>st</sup> MBBS the focus has shifted to cognitive learning outcomes with the purpose of completing the syllabus in limited time. Though active dissection and learning on prosected material have often been compared for learning outcomes but active participatory demonstration by students on prosected parts in combination to active dissection has never been studied before.

Cadaver dissection has always been the keystone of anatomy education and goes a long way in retaining and recalling mental images however supplementary participatory learning technique (PLT) in terms of demonstration on prosected parts by students on the same topic should enhance learning through participation, interaction and recurrence in presence of facilitators.

A total of 50 1<sup>st</sup> MBBS students divided into 2 groups of 25 each were studied for the effectiveness of this teaching learning method in increasing the cognitive domain (knowledge). One group was exposed to PLT by allowing them to demonstrate on prosected parts post routine dissection while the other group was restricted to traditional dissection only. Both the groups were evaluated by objective structured viva questionnaires after 30 days post completion of a region (inferior extremity). The groups were swapped such that the group exposed to PLT now did traditional dissection only and the other group was asked to do demonstration on prosected parts in addition to routine dissection. After another 30 days both groups were evaluated by objective structured viva questionnaires post completion of a region (superior extremity).

At end of study the outcome measured in terms of students satisfaction with the exposure to participatory demonstration assessed through yes/no questionnaire indicated better satisfaction. The outcome measured in terms of enhanced cognitive skills (knowledge) by objective structured viva questionnaires also indicated better results.

The study concluded that participatory learning in terms of demonstration on prosected parts by 1<sup>st</sup> MBBS students in addition to traditional dissection had a positive impact on knowledge of the medical students in anatomy pertaining to topics inferior and superior extremity.

**Keywords:** Cognitive, Participatory learning technique (PLT), Prosected parts, Dissection

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The word participation means involvement – the action of taking part in something. Participatory Learning Technique (PLT) is a form of classroom organization which utilizes students who actively participate in the learning tasks under the guidance of the subject teacher. The fundamental basis of all participatory learning methods is that the learners are active participants instead of passive listeners. It is said “to teach is to learn twice” and hence asking students to demonstrate on prosected parts will encourage self directed learning and also enhance retention of subject information.

Though there is active participation in dissection only 2-4 students actually get to dissect a body in a table assigned for 12-16 students or more. In addition the skilled efforts required to reveal structural details can be cumbersome for students especially when there are time constraints. Under such circumstances if students get prosected parts with clearly dissected structures and they are allowed to demonstrate the structures after having gone through the process of dissection the students will benefit more through deeper

### Introduction

Cadaveric dissection is traditional and most favorable approach for achieving important learning objectives amongst medical undergraduates in the field of anatomy. A shift from traditional dissection towards newer techniques like teaching on prosected parts, virtual 3D softwares, video clips, models and living anatomy have gradually occurred over the last several years<sup>[1,2]</sup>. However traditional dissection still remains the cornerstone of Anatomy<sup>[3]</sup>. The newer approaches have always been a better supplementary tool rather than excelling in isolation. With declining hours devoted to 1<sup>st</sup> MBBS the focus of curriculum has shifted to cognitive learning outcomes with the purpose of completing the syllabus in limited time. Though active dissection and learning on prosected material have often been compared for learning outcomes<sup>[4]</sup> but

understanding and longer retention having reprocessed the knowledge. The teacher acts as facilitator and intervenes wherever the student falters and accordingly rectifies the information through continuous feedback.

Our Institution has a perennial flow of voluntary body donations which makes sufficient cadavers available for undergraduate dissection. The faculty and residents also take serious efforts to maintain a bank of region wise prosected parts. Hence this study was feasible in our institute with favorable co-operation from faculty and students. Activity in terms of participatory demonstration in addition to routine dissection was found to improve learning ability under the guidance of the table teacher. This mechanism of repetitive practice helped creating a visual nexus for cognitive consolidation.

### Materials & Methods

**Study design and setting:** This was a single institutional based interventional study carried out in a Government institute in Maharashtra.

**Study tools:** Post intervention questionnaire whether students were satisfied with the exposure to participatory demonstration in terms of 'yes' or 'no'.

Pre-validated objective structured viva questions of 50 marks each on inferior and superior extremity. The viva question was devised in consultation with faculty members and validated through similar exercise on senior batch students. The viva questionnaire consisted of two structure identifications, the anatomic

relationship of the structure with surrounding elements, the blood and nerve supply of the identified structure and its clinical importance. All questions were compulsory.

**Participants:** A total of 50 1<sup>st</sup> MBBS undergraduate students were enrolled for the study purely on voluntary basis. They were divided into 2 groups of 25 each.

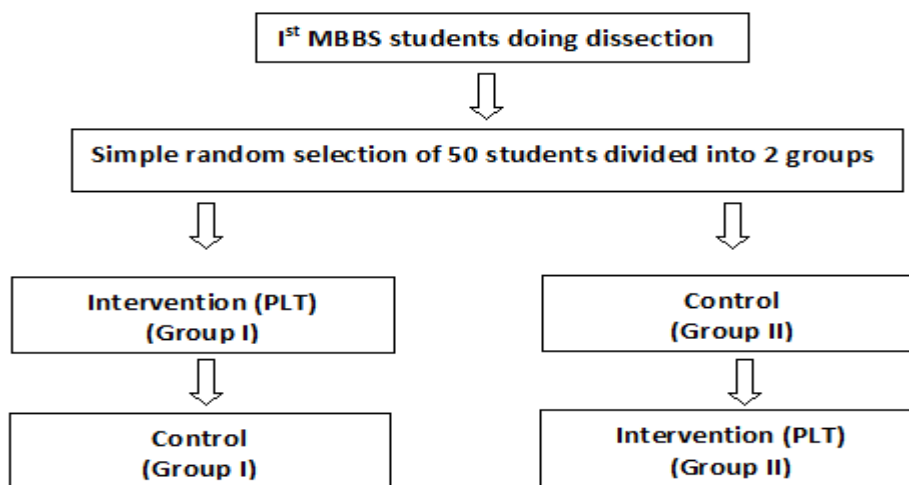
### Intervention (Plan of study):

**Group I** of 25 students were exposed to 30 mins demonstration by students on prosected parts post dissection 4 days a week for 30 days on topic inferior extremity. **Group II** was involved in routine dissection only, without any exposure to participatory demonstration on prosected parts.

After completion of inferior extremity both groups were swapped such that **Group II** was now exposed to intervention of participatory demonstration on superior extremity for 30 days while **Group I** was involved in routine dissection only.

### Data collection

1. Post intervention Satisfaction Questionnaire in terms of "yes" and "no" collected from both group I and II after completion of both inferior and superior extremity. Those undecided were advised to opt for "no" as a choice.
2. Cognitive scores obtained by group I and II based on marks attained out of 50 in objective viva questionnaire for inferior extremity and superior extremity.



## Results

**Table 1: Table showing satisfaction and knowledge score in Group I & II before and after intervention**

	<b>Intervention</b>	<b>Topic</b>	<b>Percent of students Satisfied with intervention</b>	<b>Average marks obtained by groups out of 50</b>
<b>Group I (Case)</b>	Participatory demonstration on prosected parts	Inferior extremity	90%	44.12
<b>Group II (Control)</b>	Routine dissection	Inferior extremity	-	40.16
<b>Group I (Control)</b>	Routine dissection	Superior extremity	-	42.48
<b>Group II (Case)</b>	Participatory demonstration on prosected parts	Superior extremity	90%	45.30

## Discussions

Anatomy is one of the toughest subjects in MBBS. With a truncated 1<sup>st</sup> MBBS course of less than 1 year it has become an exponential challenge to complete the syllabus and simultaneously ensure maximum learning. Many parts of the Western world have shifted from traditional dissection to teaching on prosected parts to tide over paucity of time and decreasing number of cadaver inflow. This study was an effort to combine traditional dissection with participatory learning technique wherein students involved themselves in demonstration on prosected parts on the topic covered for the day. Since our institute has a substantial number of cadavers with topic wise prosected parts prepared by faculty and post-graduate students it was feasible to carry out the study.

Participatory learning is when the student and the teacher collaborates actively and equally in the teaching learning process for better educational outcome<sup>[5]</sup>. Learners tend to retain information based on their involvement in the learning process. The teachers being actively involved get a continuous feedback on the learning process so that they can modify and structure the teaching to improve student understanding. Though traditional dissection involves enough active participation but only 2 students get opportunity to do dissection on a cadaver while rest of the students has to wait for their turn. In effect on a table of 12-16 students only 2-4 students actively dissect. Since more than 2 hours are available each day 4 times a week for dissection, the study was designed to utilize last 30 min of dissection time to discuss and demonstrate prosected parts on topic of the day. In order to involve the participation of maximum students each student of a table was asked to demonstrate on prosected parts for 2 mins each. After demonstration 1 min was given for correction through discussion. All through the process the table teacher acted as moderator and summarized the topic with take home messages.

This PLT of involving students in demonstration of prosected parts helped in better learning as students got opportunity in reprocessing content thereby leading to

deeper understanding and longer retention. The results of the structured viva questionnaire that followed at the end of each region (inferior extremity and superior extremity) exhibited mean higher score by group exposed to the intervention. Group I had a mean score of 44.12 (out of 50) after exposure to participatory demonstration in inferior extremity compared to Group II (control group doing traditional dissection only) that scored average of 40.16 only. Similar results were obtained after swapping the Group I & II for superior extremity. The statistical analysis carried by crossover design concluded better results for the groups exposed to participatory demonstration on prosected parts.

Participatory learning is an effective mean to engage the reluctant learner who is more inclined to know the end without going through the process<sup>[6,7]</sup>. This participation gives him an opportunity to immediately apply his knowledge and put into use the newly acquired skills. Whenever there is exposure to discussion to resolve academic disputes through application of knowledge the student engages himself more and the learner feels better as they perceive their actions making a difference. In our study the students got an opportunity to discuss and demonstrate the topic of the day on prosected part after routine dissection. This primarily engaged the passive onlookers into active discussion. While demonstrating they also improved their communication skill in addition to their cognitive domain that got a boost through repetition and reprocessing. The table teacher also got a continuous feedback through formative assessment that helped him to identify the weaker students and hence modify the course to achieve maximum learning for maximum students.

The satisfaction score was approximately 90% amongst the students who found participatory demonstration on prosected parts to be more beneficial in the understanding of anatomy of extremities. The 10% of students who opted for "no" in the satisfaction score were the ones who were unable to decide on the benefit in learning and understanding anatomy through the intervention.

Duze and Choosangthong in their separate studies have emphasized that participatory learning is an effective strategy to build interest amongst students for better educational outcomes<sup>[8,9]</sup>. Though our study clearly suggests that participation of students in demonstration of prosected parts in addition to traditional dissection produced better cognitive scores; the process was both time and labour intensive for the teacher. Such small group teachings can only be carried out in presence of 1 teacher for every table with maximum 10-12 students. Regional anatomy of extremities is easier compared to abdomen, head & neck and neuroanatomy and the short time allotted for 1<sup>st</sup> MBBS may not suffice to undertake such time consuming teaching learning process.

### Conclusion

It will not be wrong to conclude that while traditional dissection gives the best “hands on” experience additional participatory demonstration by students on prosected parts gives a better “minds on” experience. The students invariably develop deep understanding and longer retention through repetition and active participation. We need to work on the feasibility of introducing participatory learning in dissection in addition to the existing traditional methods.

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