

## Peer Assisted Tutorial to cultivate self-directed learning practice among first year medical students in Anatomy

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### Abstract

**Background & Objectives:** Anatomy is the foundation stone of medical education upon which knowledge is built over time. Tutorials are a part of curriculum along with routine dissection and practical in teaching anatomy. A conventional tutorial lacks active learning habits among students. Knowledge explosion demands the students to inculcate self-directed learning habits from the beginning of medical education. Peer assisted tutorials is one such strategy to imbibe self-directed learning culture.

**Methodology:** The study was conducted on regular tutorial batch of 25 students in 2 groups (group A & B) with 2 topics (brachial plexus & mammary gland) by cross over method. Pre and post test was administered followed by immediate feedback questionnaire.

**Results:** The study revealed improvement in post test scores of both group but statistically significant in study groups. There was significant improvement in comparison of post test scores between study and control wings of group A (brachial plexus) but not in group B (mammary gland). The questionnaire revealed peer learning was active, interactive which fostered in depth understanding of subject in a non-threatening learning environment.

**Interpretation & Conclusion:** The benefits and drawbacks of the innovation are discussed and compared with earlier studies. Peer learning supports the saying “to teach is to learn twice” which is evident from this study.

**Key words:** Peer learning, Self-directed learning, Active learning, Anatomy, Tutorials

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### Introduction

Anatomy has always been a foundation stone in medical education. It is an unquestionable fact that the thorough knowledge of anatomy plays a critical role in proper understanding of any other branch of Medicine.<sup>[1]</sup> It is vital to teach fundamental principles of anatomy from the beginning of medical profession and expand knowledge on it over time. These principles are expectedly best taught during dissection and further enforced with supplementary methods.<sup>[2]</sup> It is very apparent that no single method can provide domination on the other for teaching anatomy.

Teaching in medical profession is a challenging task. Large amount of information has to be delivered to students in a limited period of time. Students prefer multiple learning styles to acquire information. With the transition towards competency based curriculum teacher role is to utilize multiple active learning strategies to cater the learner's needs. Despite of this, uniformity continues to prevail in teaching methods utilized.

The challenges are to reinstate more effective teaching and learning tools while maintaining the beneficial values of orthodox dissection.

Knowledge explosion in field of medicine has lead to inclination towards exploration into self-directed learning methods. These SDL methods provide opportunities to cater the different learning styles and preferences of diverse student body.<sup>[3]</sup>

Conventional tutorials are routinely practiced teaching programme for medical students as a supplement to lectures. Tutorials provide an interactive learning environment where students can clarify material presented in lectures and extend through readings, discussions. They assist students with structured learning. The conventional tutorial lack active participation by students, promote passive learning strategies and lack opportunity for team work. Responsibility for learning should be placed on the student, with the instructor's role shifting from lecturer to facilitator.<sup>[4]</sup>

Peer Assisted Tutorials (PATs) was initiated to overcome certain deficiencies of the conventional tutorial and embrace some merits of its own. It gives an opportunity to study collaboratively with peers in an informal and not-assessed environment.

This study investigates how Peer assisted tutorials are an innovative method of educational technology to provide more engaging ways to build enhanced learning environments.

**Materials and Methods**

Regular first year MBBS curriculum has conventional tutorials apart from lectures, dissections.

The study was conducted on 1<sup>st</sup> year medical students during regular tutorials. Cross over study method was used. 25 students of the tutorial batch participated in the study. They were divided into 2 subgroups; Group A with even roll numbers and group B with odd numbers. Group A was given brachial plexus as topic for which group B acted as control. Group B was study group for topic mammary gland for which group A acted as control.

**Preparatory Stage:** 2 students volunteered to be tutor. They were given topic a week ahead. Tutees were also informed about the topics. The tutors and tutees were sensitized on PAT by faculty facilitator. The study and control groups of both topics were administered with pre-test and post-test. The actual PAT extended for 30 min approximately in both groups which was monitored by facilitator. During the process tutor initially presented the topic in his or her convenient mode. Tutees could intervene and clarify whenever needed. The group discussed the topic in detail. Tutor summarized the topic in the end with final note. Faculty facilitator intervened only when required especially

when the team was deviating from the topic. Students were asked to complete a feedback questionnaire after post-test to compare the tutorials with new method. The questions were scored on a 5-point Likert scale, with 1 representing strong disagreement with the statement and 5 strong agreements. In addition, students were asked open-ended questions regarding the positive and negative aspects of the PAT. The data obtained were analyzed statistically. Parametric test of significance, Paired t-test was applied for comparing the pre and post test scores of cases as well as controls. Unpaired t-test was applied for comparing post test scores between cases and controls (p<0.5 was considered significant). The feedback questionnaire was analyzed based on percentage of responses. The open ended questions were thematically categorized as benefits and drawbacks of PAT. Tutors responses were recorded.

**Acknowledgement:** I thank the students of 1<sup>st</sup> year MBBS for their consent and cooperation for this study.

**Results**

The pre-test and post test results were compared between study and control group of both topics. There was improvement in post test scores of both group but statistically significant in study groups (Table 1 & 2).

**Table 1: Pre and post-test comparison: Brachial plexus**

	Category	Mean	Std. Deviation	Z	P
Study group	Pretest	3.6786	2.91948	2.944	0.003
	Posttest	5.9643	3.10994		
Control group	Pretest	2.0385	1.89804	0.649	0.516
	Posttest	2.1923	2.37643		

**Table 2: Pre and post-test comparison of study group: Mammary gland**

	Category	Mean	Std. Deviation	Z score	P value
Study group	Pretest	3.6923	2.68901	2.816	0.005
	Posttest	6.0769	3.61620		
Control group	Pretest	4.2308	2.20431	0.000	1.00
	Posttest	4.3077	2.09701		

There was significant improvement in comparison of post test scores between study and control wings of group A (brachial plexus) but not in group B(mammary gland) [Table 3]

**Table 3: Comparison of Post test scores between study and control wings of both groups**

Brachial plexus group			Mammary gland group		
Group	Mean Rank	P	Group	Mean Rank	P
Study	18.29	0.003	Study	16.50	0.045
Control	9.38		Control	10.50	

**Table 4: Feedback questionnaire administered on students (n=25)**

	Items	Disagree %	Neutral %	Agree %	Strongly Agree %
1	Interesting to work as a team and beneficial to work.	0.00	8.70	30.43	60.87
2	Interactive way of learning and understanding.	0.00	0.00	34.78	65.22
3	Motivated learning.	0.00	4.35	52.17	39.13
4	PAT is more informative than classical tutorial system	17.39	30.43	26.09	26.09
5	Clear about the topic we discussed.	0.00	47.83	52.17	0.00
6	Analytical ability improved due to discussion with peer.	0.00	21.74	47.83	30.43
7	Learnt more actively than during regular tutorials.	17.39	8.70	43.48	30.43
8	Informal and non-threatening learning atmosphere	0.00	4.35	34.78	60.87
9	PAT can make studying more enjoyable.	0.00	4.35	34.78	60.87
10	More such sessions in future	0.00	13.04	21.74	65.22

\*\*Strongly agree was not answered for any items by anybody

**Table 5: Themes segregated from opinion of students on benefits and drawbacks through open ended questions**

Benefits	Drawbacks
Friendly, encouraging, interactive environment	Tutors may not be as trust worthy as teacher
Increases student depth of knowledge, quality and confidence	Some tutees lack seriousness
Helps to assess each other	More preparation needed fast tutor
Understood topic better	
Good student preparation and involvement	
Small groups made learning better	

Tutors in their feedback expressed that they understood the topic better due to their role as teacher. They wanted more such sessions.

## Discussion

Peer Assisted Teaching is an effective educational intervention as learning occurs in informal, interactive and interesting way. The concept of peer teaching is not new. In 1988, Whitman and colleagues have deliberated on peer teaching in higher education and its psychological benefits for students.<sup>[5]</sup> Peer teaching has been recognized as a valuable and effective approach for learning and has been incorporated into various professional courses using an array of approaches.<sup>[6]</sup>

91% of the students found it was interesting and beneficial to work as a team. Tencate O found that working in groups is interesting and peer assisted learning may build self-directed learning skills, trust, evaluative judgement, and the ability to partake in productive team work.<sup>[7]</sup>

All the participants appreciated that there was complete involvement of every participant due to interactive way of learning and understanding. A higher

education report has stressed that in PAT, student teachers gain a better understanding of the subject.<sup>[5]</sup> The educational environment is a key factor to enhance student learning. Peer tutoring is efficient in promoting interactive learning. This lead to clear understanding of concepts in the subject studied.<sup>[8]</sup>

Also 96% of the participants found it motivated learning. The studies by Benware and Omer compared the relative effectiveness of reading to learn for a test and reading for learning to teach a peer. Students found better conceptual understanding of the topic. They perceived their learning experience as motivated, active and interesting.<sup>[9,10]</sup> Hodgson Y in his peer assisted learning programme found that the 'teaching' role provided the benefits of 'active learning' and promoted deeper knowledge acquisition associated with peer learning. The survey revealed that peer assessment caused students to listen more attentively to their peers'

tutorials and to be more meticulous in contributing to their own groups' tutorial.<sup>[11]</sup>

Pedagogical advantages for the tutee include more active, interactive and team learning, immediate feedback, swift prompting, lowered anxiety with correspondingly higher self-disclosure, and greater student ownership of the learning process.<sup>[12]</sup>

78% of the students in the present study expressed opinion that their analytical ability improved. The study by Tariq found that the majority of students reported PAT to be a valuable and positive learning experience (80%). By the end of the program, 74% of the students felt more confident, and 82% felt more knowledgeable in regards to their numerical and problem-solving abilities.<sup>[13]</sup>

27% disagreed or was neutral for the "Learnt more than during tutorials and 87% of candidates wanted more such sessions in future. When asked to compare lectures directly with listening to their peers Pathology presentation, 27 out of 34 (79%) students said that the lectures were more interesting while only seven out of 34 (21%) said that learning from their peers was more interesting<sup>[11]</sup>. Probably this might be due to lack of confidence of tutees on their tutors than lecturers which was elicited in the present study.

But Jackson T A in his study found that student feedback on the individual tutorials remained constantly high throughout the program, suggesting that the feedback was based on the learning experience and not the novelty of the program.<sup>[8]</sup>

Omer S et al reported that group members who interacted well were able to explain concepts to each other. 95% agreed that they worked well as a team, 96% experienced better learning with clear understanding of the topic. 94% recommended to continue similar sessions in future.<sup>[14]</sup> 87% of students in the present study wanted to have more PAT sessions.

A brilliant study by Annis (1983) compared three randomly allocated groups of students: the 'read only' group gained less than the 'read to teach' group which in turn gained less than the 'read and teach' group. The tutors gained more than the tutees.<sup>[15]</sup>

According to Topping one of the specific benefit of peer-based learning is lower student anxiety and higher student disclosure during tutorial work (Topping, 1998).<sup>[16]</sup>

Although much research evidence exists in favour of peer tutoring, the worth of such methods is still challenged by some practitioners. Typical concerns centre on the quality of student tutors and the time and effort needed in training and supervision of the tutors. Students opined they were concerned about how much they could rely on tutors as subject experts.

Srivastava K T et al in their study on role of Peer teaching to foster physiology learning found that 91% found it enjoyable, 89% wanted to have more such sessions in future especially as tutors.<sup>[17]</sup>

Like the present study even Benware and Annis<sup>[9,15]</sup> have reported not a significant difference in post test scores but the higher order conceptual understanding of the topic was observed among tutors. Tutors had gained more than tutees. This supports the axiom that "to teach is to learn twice".

The PAT was successfully implemented and received positive comments from the students involved; however, there were some drawbacks. The tutors expressed the time required to prepare for the session was taxing which was also observed in the study by Srivastava K T.<sup>[17]</sup> According to education theory, medical students learning and applying teaching principles may become active participants in their own learning process. In a review conducted on students-as-teachers, Peer-teaching was compared with conventional methods. There is strong evidence that if utilized in selected contexts the participating student-teachers benefit academically and professionally. But most of the outcomes are short term without any evidence of long term impact<sup>[18]</sup>.

## Conclusion

Peer tutoring is a small innovation out of a wide range of teaching and learning strategies deployed in medical education. The extent to which it is pragmatic to bring observable and sustained gain is debatable. However PAT promoted self-directed learning and encouraged the students to take ownership of their learning. This study was done for two topics. However, long term studies with more topics repeated for over batches to sustain benefits of this method.

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