

## To Examine Students' Viewpoint on Active Learning Techniques: A Comparative Study

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### Abstract

**Aim:** The aim of the present study was to assess the students' perspective regarding active learning methods and to compare outcome of active learning method to previous traditional teaching methods.

**Methods:** The present study was carried out in the Physiology Department. Students and faculty were informed and introduced to active learning strategy regarding a particular topic.

**Results:** The mean value and standard deviation for Group 1 consisting of 50 participants and Group 2 consisting of 50 study participants were 32.44±8.12 and 26.64±8.32 respectively. It indicated that students of active learning group performed significantly better than students with traditional learning methods ( $P < 0.0001$ ). Majority of students were in favor of this new teaching method. Students developed more interest and better understanding in lectures. Group study discussion leads them to develop their knowledge more in comparison to traditional methods and also better interactions and environment created due to this method. Pause period method made a good impact in understanding the topic. Furthermore, the use of MCQs, models and role plays created more healthy surroundings in understanding renal physiology. Students' also find it easy to correlate with clinical content. Even students were keen to attend more seminars like this, also ready to increase more number of tests and short work assignments. Majority of students' felt a healthy change in atmosphere due to these new methods.

**Conclusion:** Active learning method definitely helps in better understanding of the subject in comparison with the old didactic method of teaching. This conclusion suggests that we should need to promote active learning methods more in different fields so that the development of knowledge occurs in way which is beneficial to all. These new methods also developed interest of teacher and due to this a student- teacher relationship also became better.

**Keywords:** Active Learning, Traditional Learning, Pause Procedure, Jigsaw Technique

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### Introduction

Becoming a physician is a difficult process, and the early years of undergraduate medical education can have a significant effect on this process. Besides, with the move toward the reforms of medical curriculum in recent years, there have been emergent attempts to make some occasions for integration of pre-clinical and clinical phases and Early Clinical Exposure programs (ECE). [1] In recent years, the importance of ECE has increasingly been highlighted by medical education experts. [2] ECE is defined as patient contact in a clinical environment in pre-clinical period that improves learning. [3]

The objectives of ECE are to improve the medical students' attitude toward basic sciences and clinical skill training, foster deep learning in pre-clerkship setting, encourage the professional interests. [4] A systematic review about ECE revealed that it can improve self-awareness, and make students happier with their medical education curriculum and self confidence in meeting the patients. ECE can motivate them and reduce the stress of meeting patients. It exposes the students to clinician role models, reinforces the students' learning, and helps them learn about how clinicians and the healthcare system can take care of the patients. It can strengthen learning of basic sciences, biomedical and social

sciences and educational objectives that cannot be learned from textbooks. ECE can also help the teachers, healthcare providers and patients. [3]

Many educators agree that students do not perform as expected<sup>5</sup> and also the traditional learning methods do not promote long-term retention [6], it is still a common method used by many of them. Hence, the key to provide an active learning environment lies in how the teacher views his or her role in the learning environment. [7] Active learning methods reach to all type of learners no matter which field. Learners also can be categorized or identified on their preference for type of learning such as visual, auditory, reading, or writing. In a study, Baykan and Nacar have suggested that nearly 64% of students' shows multimodality, means that they prefer a combination of learning methods. [8] Traditional methods for teaching physiology are limited to teaching through lecturing and PowerPoint slides. Hence, this new approach provides little opportunity/window for student engagement above lower-order cognition. [9]

The aim of the present study was to assess the students' perspective regarding active learning methods and to compare outcome of active learning method to previous traditional teaching methods.

### Materials and Methods

The present study was carried out in the Physiology Department of Employees' State Insurance Medical College and Hospital, Bihta Patna, Bihar, India. Students and faculty were informed and introduced to active learning strategy regarding a particular topic. To make them more familiar with the ongoing project a PowerPoint presentation was given, in which purpose behind this initiative and various techniques were explained and discussed in detail. Informed consent from students was taken in this regard.

In medical physiology class, renal component was presented to the 1st year medical students. Students were divided into two batches of cohort. Both

batches were comprised 50 and 50 students, respectively, in cohort 1 and cohort 2. In cohort 1 (50 students), around 30 classes of 60 min each and 10 demonstration classes of 100 min each were taken. Different active learning methods were introduced in all classes one by one. Active learning methods used to teach these classes included student-teacher interaction, blended learning, jigsaw technique, peer discussion and pause procedure, discussion of multiple choice questions (MCQs), seminars, role plays, and use of models. Students were formed into small groups of five each. In each group, students worked together to understand relative topics and motivated each other in execution.

For the comparison of how effective these new active learning strategies, the results of cohort 1 was compared with the result of the cohort 2, who have taught with traditional learning methods. Both batches were identified with the name of cohort 1 (active learning method) and cohort 2 (traditional learning method) according to the methods they have been taught. An identical test was taken in both batches. The test was of 50 marks each, having 12 marks MCQs and 38 marks short structured questionnaire.

A feedback questionnaire based on 5-point Likert scale was administered to the students after completion of the project. It consisted of both closed- and open-ended questions. Feedback from students was compiled and analyzed by frequency analysis.

### Statistical Analysis

The data were entered into Microsoft Excel 2010 and analyzed using EPI INFO Ver.7 software. "Z test" was used to find out any significance. Apparently,  $P < 0.05$  was considered as statistically significant, and the result was shown in mean  $\pm$  standard deviation.

### Results

**Table 1: Result of both groups in renal physiology test**

Groups	Number of students( <i>n</i> )	Marks obtained (Mean+SD)	<i>P</i> -value
Cohort 1 (active learning method)	50	32.44+8.12	<0.0001
Cohort2(Traditional learning method)	50	26.64+8.32	

The mean value and standard deviation for Group 1 consisting of 50 participants and Group 2 consisting of 50 study participants were 32.44+8.12 and 26.64+8.32 respectively. It indicated that students of active learning group performed significantly better than students with traditional learning methods ( $P < 0.0001$ ).

**Table 2: Feedback form from the students**

Questions	SA	A	N	D	SD
Better than traditional learning methods	34	48	12	4	2
Development of interest in lectures of physiology	28	60	8	3	1
Better understanding in lectures than before	30	58	12	0	0
Better understanding found with the help of models	52	40	9	1	0
Increased frequency with fellow group members regarding study	35	48	11	4	2
Did the pause period help in discussing topic better	32	48	12	6	2
Using MCQs helpful in learning various topics	52	36	8	3	1
Create interest in learning even after classes	23	47	10	14	6
Role plays create more interest in learning and understanding	68	28	3	1	0
Easy correlation with clinical content	42	32	16	9	1
Did short seminars make better impact	26	42	22	8	2
Frequency of seminar should be increased	26	40	24	7	3
Short work assignments should be included to increase knowledge	30	28	26	10	6
Atmosphere in class was tense	1	18	23	18	40
Number of tests should be more after this type of session	28	35	20	12	5

Majority of students were in favor of this new teaching method. Students developed more interest and better understanding in lectures. Group study discussion leads them to develop their knowledge more in comparison to traditional methods and also better interactions and environment created due to this method. Pause period method made a good impact in understanding the topic. Furthermore, the use of MCQs, models and role plays created more healthy surroundings in understanding renal physiology. Students' also find it easy to correlate with clinical content. Even students were keen to attend more seminars like this, also ready to increase more number of tests and short work assignments. Majority of students' felt a healthy change in atmosphere due to these new methods.

### Discussion

The process of acquiring new or modifying existing knowledge, skills, values, or behaviors is known as learning.<sup>10</sup> Living beings such as humans and animals also plants as well as some machines have an ability to learn. [11] Active learning occurs when a person takes control of his/her learning experience. The key aspect of learning is understanding information, so it is important for learners to recognize what they understand and what they do not. Active learning encourages learners to have an internal dialogue, in which they verbalize understandings. Furthermore, learners are keener to learn when they have control over how as well as what they learn. Active learning is a key characteristic of student-centered learning. [12] An learning environment which allows students to read, write, listen, talk, and reflect as they interact with the course content through seminars, role plays, small group discussion, and other activities is called active learning. [13]

One of the disciplines in basic science that is highly related to clinical medicine is physiology. A basic

science, like physiology, should be well-educated as an applicable subject, for use in the clinical setting. Acquisition of a massive amount of knowledge could not permanently mean that the student will be capable of relating that knowledge in a clinical situation for patient care. Perfect knowledge of physiology will be a perfect acceptance of its clinical correlations, and will consequently lead to a comprehensive clinical practice and patient care. Therefore, physiology would be well understood, remembered and practically used if educated in a clinically arranged setting. [14] The mean value and standard deviation for Group 1 consisting of 50 participants and Group 2 consisting of 50 study participants were 32.44+8.12 and 26.64+8.32 respectively. It indicated that students of active learning group performed significantly better than students with traditional learning methods ( $P < 0.0001$ ). Majority of students were in favor of this new teaching method. Students developed more interest and better understanding in lectures. Group study discussion leads them to develop their knowledge more in comparison to traditional methods and also better interactions and environment created due to this method. Pause period method made a good impact in understanding the topic.

Furthermore, the use of MCQs, models and role plays created more healthy surroundings in understanding renal physiology. Students' also find it easy to correlate with clinical content. Even students were keen to attend more seminars like this, also ready to increase more number of tests and short work assignments. Majority of students' felt a healthy change in atmosphere due to these new methods. A study by Freeman et al [15] also suggested that traditional lecture methods promotes a "teaching by telling" approach, in which the students' involvement is very limited in terms of capturing and understanding the topic than just

taking notes regarding it. Another study done by Pushpa et al [16] revealed that the use of active learning methods including student-centered tutorial activities, group-based study, online support, and intra semester assessment was clearly helpful in achieving the better result and improving students' knowledge. [17]

Students' did enjoy these new initiatives and also stay focused and engaged during classes. [18] As we also added role plays into our ALMs to make better the understanding of renal physiology, Dowlati [12] and his team also use dramatization in teaching cardiac cycle in physiology class of medical students. The knowledge and performance by the students who learned this topic by role plays were better than those who have been taught by only traditional methods. Similarly, we also found positive response in students' knowledge improvement and remembering capacity after the role play method. [19] Another study regarding teaching cardiac physiology to dental students with the effect of puzzle on the process by Lais et al. [13] suggested that this educational game improved the learning process of undergraduate dental course students and confirmed student perception that the use of this game helped them to understand the topic better. Helena et al. [14] also tried active learning methods in understanding of physiology better and showed that group who had been taught the subject through active learning methods improved their performance and got a greater percentage of correct answers compared with the other group that received only traditional teaching. Similar findings were recorded in our study also.

### Conclusion

Active learning method definitely helps in better understanding of the subject in comparison with the old didactic method of teaching. This conclusion suggests that we should need to promote active learning methods more in different fields so that the development of knowledge occurs in way which is beneficial to all. These new methods also developed interest of teacher and due to this a student- teacher relationship also became better.

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