

LEARNING APPROACHES OF MEDICAL STUDENTS IN A CASE-BASED LEARNING CURRICULUM IN PRE-CLINICAL YEARS

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ABSTRACT

Objective: To determine the learning approaches of medical students in their pre-clinical years in a case based learning curriculum.

Study Design: Descriptive (Quantitative) study.

Place and Duration of Study: Army Medical College Rawalpindi Pakistan, from Jan 2017 to Jul 2017.

Materials and Methods: Two hundred students from 2nd year MBBS participated in the study by filling a 52 items questionnaire-Approach and study skills inventory for students. Students' scores were measured separately for surface, deep and strategic approaches. Gender difference regarding the preferred approach of students was also found out. Analysis was carried out by using student t-test on Microsoft Excel Sheet.

Results: There is a significant difference (p -value < 0.05) between the number of surface learners when compared with number of deep and strategic learners. A preference for the deep or strategic approaches has been noticed in both female and male students.

Conclusion: The study provided evidence that even in very initial years of medical studies where case based learning has been introduced as a student-centered strategy, it is promoting a deep or strategic learning approach in medical students. These approaches have been considered helpful in making students lifelong learners. It also helps in identifying the surface learners at the same time. Their identification will help and guide teaching faculty and the curriculum planners about the scope of different teaching modalities to be used in the best interest of the students.

Keywords: Case-based learning, Learning approaches, Medical students.

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INTRODUCTION

Medicine is an ever-evolving profession and requires medical teachers and students to update themselves according to the latest innovations and global trends in the relevant profession¹. As it comprises of huge amount of content knowledge; it is hard to understand, retain and comprehend all of it especially if it was taught in the old traditional manner of lectures. Different innovative teaching methods have been attempted focusing on student's behavioral activity during learning². A changing trend has also been noticed to be in progress where a shift has resulted from didactic, subject based traditional mode of teaching to a more student-centered teaching methodology¹ or strategy. This

trend has been accepted by medical students as such strategies comprise of interactive sessions where teachers and students contribute in the learning process and retention is found better^{2,3}. Case based learning (CBL) is considered as one of such strategies where students are involved in an interactive discussion regarding a clinical case and their prior knowledge⁸. Tutor acts as a facilitator and keeps the students on the right track. In Pakistan, few medical schools curricula have adopted this new method of learning and teaching and have received satisfactory response from the students³. The way students approach their learning plays an important role in determining the outcome or consequences of any educational endeavor²². Learning approaches have been categorized as surface, deep and strategic approaches^{4,23,24}. Students adopting the surface approach desire to complete the course as they fear of exams. They memorize most of the

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content with an intention to reproduce it in the assessments and end up with just superficial understanding. The students with deep approach are motivated by an interest in the subject and recognize its relevance. Their intention is to understand its meaning and relate it to their previous knowledge and personal experiences. They retain knowledge in an effective way. Students who adopt strategic approach want to be successful and achieve high grades. They use either surface or deep approach depending upon the content and method of assessments. The deep approach is the most desirable way of learning as it is linked with the intellectual processes we wish to see in medical students. Various attempts have been made by medical educationalists to optimize student's approaches to learning towards deep, meaningful learning by means of implementing student-centered teaching methods²¹. Such efforts have not always been successful as inducing a deep approach is not easy²². Measuring student's approach to learning in an educational environment is important in⁵:

1. Identifying students at risk because of their ineffective strategy
2. Observing the outcomes of learning and teaching strategy
3. Providing guidelines to the curriculum planners
4. Monitoring and improving the effectiveness of teaching methodologies
5. Helping students become better and life-long learners

The study aimed to:

- Identify the correlation between gender and the preferred learning approach among undergraduate medical students.
- To explore different approaches used by medical students in pre-clinical years when they are experiencing case based learning sessions as a teaching tool.

METHODOLOGY

It is a descriptive study where a cross-sectional survey was conducted at Army Medical

College, Rawalpindi. The institute was selected to conduct the study because it is mature in using case-based Learning as one of its teaching tools. The strategy has been introduced after the introductory workshops conducted for the students by medical education department of the institution. To find out student's preferred learning approach in a CBL curriculum, was the

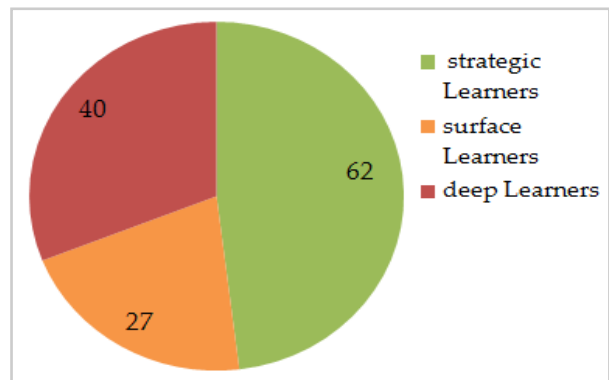


Figure-1: Distribution of students as deep, surface and strategic learners.

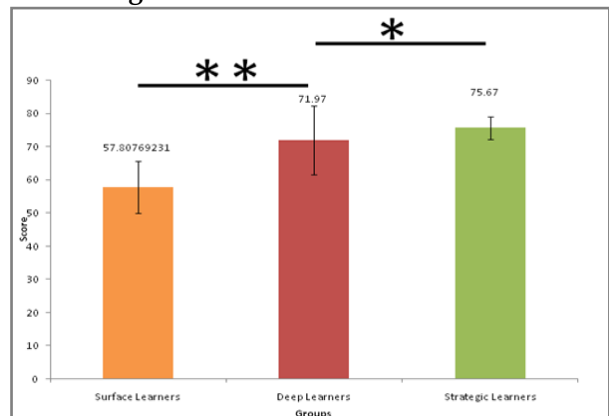


Figure-2: Difference in Mean score of Students labeled as SL, DL and St. L.

actual purpose of this study. Permission from ethical committee was taken and actual purpose of study was disclosed to the participants. Their consent was taken before the data collection phase. According to random sampling technique all 200 students of 2nd year MBBS were included in the study. A cross sectional survey was done by using a validated, reliable questionnaire-ASSIST^{6,7}. They were provided with the 52 items-questionnaire and given 30 minutes time to fill in the college premises. Questionnaires were collected and checked. Only 129 questionnaires

were found completely filled and were included in the analysis. There were 43 male and 86 female students representing 33% and 67% of male and female sample size, respectively. Scores were measured for the items identified for the surface, strategic and deep approach.

The ASSIST (The approaches and study skills inventory for students)^{6,7}

It comprises of 52 questions, each scored 1 (low) to 5 (high). The scores for sets of four questions were combined to yield subscales, and the resultant 13 subscales were then grouped to give each respondent a score for deep, strategic and surface approaches. Deep approach comprises of subscales: seeking meaning, relating

and standard deviation were calculated for quantitative variables. The response rate was 64.5%. Number of students adopting deep, strategic or surface approach was found as depicted in pie-chart. A comparative analysis between surface, deep and strategic approaches was done in general and then on the basis of gender and significant difference has been noticed. A *p*-value less than 0.05 was considered as significant ($p < 0.05^*$ and $p < 0.01^{**}$)

RESULTS

Results were analyzed and interpreted statistically by student t-test and one way ANOVA through microsoft excel sheet. The age of the participants was ranging from 18-21 years. Mean

Table-I: Means (SD) of average scores of ASSIST.

Scales	Mean	SD	CI
Deep approach	71.974	3.35	0.9
Strategic approach	75.67	10.47	3.3
Surface approach	57.80	7.79	2.4

Table-II: Comparative analysis between different approaches (in general). Significant difference has been observed.

Scales	<i>p</i> < 0.05*
Deep approach vs. strategic approach	0.0125
Deep approach vs. surface approach	0.001**
Strategic approach vs. surface approach	0.001**

Table-III: Comparative analyses in Male and Female groups using student t-test.

Scales	Male	SD	Female	SD
Surface L	56.7	7.56	58.92	8.12
Deep L	70.78	4.37	72.64	2.61
Strategic L	75.85	9.31	75.62	10.88
t-test (SL vs DL)*	2.17x10-05		2.17x10-05	
t-test (DL vs ST L)	0.081		0.080	
t-test (SL vs ST L)*	4.92x10-06		9.96x10-07	

(SL: Surface learners DL: Deep learners ST L: Strategic learners).

ideas, use of evidence and interest in ideas. Surface approach contain subscales such as lack of purpose, unrelated memorizing, syllabus boundness and fear of failure. The Strategic approach comprises of organized study, time management, achieving, alertness to assessment demand and monitoring.

Statistical Analysis

Results were analyzed and interpreted statistically by student t-test and one way ANOVA through Microsoft Excel sheet. Mean

age was 19.59 years. Two hundred students were included in the study. Out of which 129 students filled the questionnaire completely. The Response rate was 64.5%. Out of 129 students 40% were deep, 62% were strategic and 27% were surface learners (fig-1). Results revealed that Number of deep learners is significantly higher than the surface learners. Regardless of gender, pattern of scoring was found to be same in both groups (male and female). A significant difference has been observed between the students using

strategic and deep approach. The deep and strategic approaches were preferred by medical students in a CBL curriculum. The results of questionnaire also helped in the identification of surface learners. There is a substantial difference in the mean score of diverse approaches. (table-II & III), (fig-2). Average score of deep learners is 70.78 in males and 72.64 in females (table-I, fig-3 & 4).

DISCUSSION

Students use different styles of learning and studying depending upon their perception, the available context and the teaching strategies^{8,9}. This study has revealed interesting results regarding learning approaches of young medical students when they have been taught mostly by case-based learning sessions. The preferred learning approaches by medical students (both male and female students) in pre-clinical years were strategic and deep approaches while the number of students using strategic approach is slightly higher than deep approach. A significant difference has been noted among the number of deep/strategic learners when compared with surface learners. The Mean scores for surface apathetic approach remain constant in both the groups; female and male students, providing evidence that those medical students who were surface learners opted for a tedious study program. The results supported various studies⁸ where it was noted that pre-clinical students had the highest mean for strategic approach, while clinical students had the highest mean for surface approach. The present study confirms that there is a significant difference among learning approaches adopted by medical under graduates and surface learners were found to be less in number in both groups. Reasons for these preferences must be multifactorial as educational environment, teaching methodologies and personal factors play a vital role in adopting a specific approach as in a recent study in United States of America⁹. It was noticed that a desire to achieve higher grades promotes a superficial learning in students. Increased workload with a tight course schedule promotes a superficial

while assessment oriented course promotes a strategic approach. The evidence for the most successful learning approach in medical undergraduates is controversial as when examination grades were compared with the adopted approach no difference had been noted in one study¹⁰ while a definite relationship had been found between deep approach and high grades among the undergraduate students in another study¹¹. The study conducted by Marlies Baeten *et al* has provided the evidence that

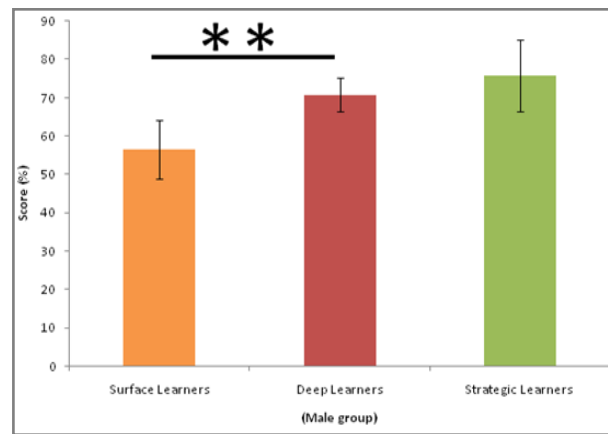


Figure-3: Comparative analysis in male students.

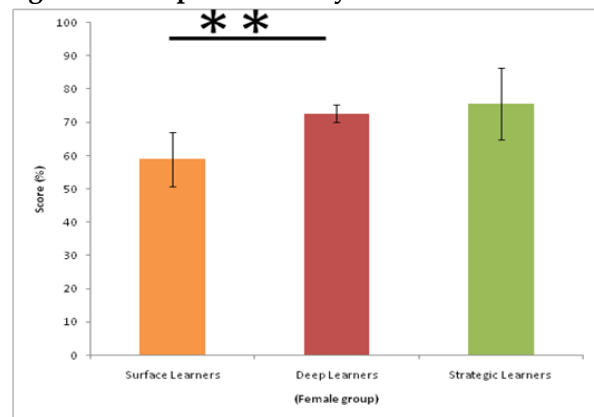


Figure-4: Comparative analysis in female students.

students approach differently according to the disciplines. She also found out that teachers play a vital role in inclining students towards a specific approach. With regard to the contextual factors their study revealed that students who are satisfied with the course content including appropriate workload, assessments, teaching and clarity of goals employ a deep approach. They have found that students who have openness in

their minds, self confident and intrinsically motivated are deep learners¹³. Several studies which have used pre-and post-test measurements about approaches adopted by students and have revealed controversial results as Tiwari et al showed that student centered activities such as CBL or PBL deepens students' learning approaches¹⁴ while others¹⁵ have found an increase in surface approach while still others have noticed a minimal change in learning approaches of students¹⁶ when pre- and post-test analysis was done. Some studies¹⁷ compared learning approaches in different context and with different levels of student-centeredness and found out that student-centered activities foster a deep approach in medical students. While MacParland *et al* on the other hand did not find any significant difference in approaches when comparing a student-centered activity with a traditional teaching^{18,19}. The present study has provided evidence that in a case-based learning environment medical students preferred a strategic and deep approach for their better understanding of the subject content. It supported the fact that activities like PBL and CBLs promote a deep or strategic approach among the medical students, being student-centered teaching strategies and the same has been highlighted by various researchers^{6,12,19,20} who emphasized that a deep or a strategic approach helps in making students lifelong learners, a trait we wish to see in all medical professionals. By exposing students to case-based learning at an early stage in their medical studies is making them to adopt a better approach for their understanding and retention.

CONCLUSION

The study concluded that medical students adopt a number of approaches towards their learning. Irrespective of the gender, most of the students prefer deep or strategic approaches to their learning compared to surface approach. It provided evidence that case-based learning is helpful in adopting a deep or strategic approach among most of the under graduate medical students in their pre- clinical years. The study

further showed that CBL also helped in identification of surface learners at the same time. This identification is important as it will help and guide teaching faculty and the curriculum planners about different teaching modalities to be used in the best interest of the students. It has supported the notion that a student-centered activity such as CBL where there is an interaction among the students and the tutor, promotes a deeper understanding of the content knowledge. Introducing such instructional methods in the earlier years of medical studies will help in making young students lifelong learners.

LIMITATIONS OF STUDY

There are certain limitations in the present study as it was a cross-sectional study. A longitudinal study would be more suited to see the relationship between the adopted approaches of the students and their scores in examinations. A qualitative analysis to find out the reasons for a specific approach will make this study valuable for curriculum planners.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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