

## CHANGES IN LEARNING APPROACHES BETWEEN MEDICAL STUDENTS AND POST-GRADUATES: A MIXED METHOD STUDY

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### ABSTRACT

**Objective:** To compare the learning approach of final year and postgraduate students and assess the influence of gender and to explore with interviews if a change occurred at postgraduate level.

**Study Design:** Concurrent mixed method.

**Place and Duration of Study:** King Edward Medical University, Lahore, from Mar 2018 to Oct 2018.

**Methodology:** Hundred final year MBBS and 100 postgraduate students were included in the study for quantitative analysis. "ASSIST" Questionnaire was used to identify student's approach to studying as either "deep", "surface", "strategic" and also to find the correlation of gender with preference of study approach. Descriptive statistics were calculated. Student's t-test was used for statistical comparisons. Qualitative data was collected through in depth semi structured interviews of postgraduate students. Thematic analysis was done to interpret the data and triangulation method was used for validation.

**Results:** The Mean age in undergraduate students was  $23.24 \pm 0.95$  years (male 52% & female 48%) and  $28.5 \pm 2.3$  years in postgraduate students (male 61% & female 39%). No significant difference was seen in mean scores for deep approach between undergraduate and postgraduate students. No significant difference was seen in the selection of approach among the females and males of both groups. Interviews indicated a change in approach from surface to deep in four postgraduate students.

**Conclusion:** There was predominance of strategic approach in medical undergraduates and deep approach in postgraduate students. Teaching and assessment methodology, clinical environment and role of supervisor changed the approach from surface to deep in postgraduate students.

**Keywords:** ASSIST questionnaire, Learning approach, Medical students, Postgraduate students.

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### INTRODUCTION

Learning approach describes the association between student, context and task<sup>1</sup>. It is the intellectual and behavioral ability of a student in search of knowledge in response to a learning situation<sup>2</sup>. It can also be defined as peculiar method that a student adopts with study and experience to achieve knowledge, skills and attitude<sup>3</sup>. Learning styles are attributes that influence cognition of learner and thus his information processing<sup>4</sup>.

Dunn *et al* defined it as different ways used by students to learn and recall information<sup>5</sup>. Biggs pointed out that students use a combi-

nation of motivation and strategy in the learning process<sup>6</sup>. Learning approaches are not fixed traits. Students change their approach according to information to be processed, the learning environment and the assessment tasks provided<sup>7-9</sup>. The reason for the diversity in students to acquire information is because of different learning approaches. As medical teachers evaluation of students' approach to learning will not only help in learning process but will also enhance student's achievement and motivation<sup>10</sup>.

Numerous models and instruments have been used to assess the learning style and approach of students. Neil Flemming presented VARK Model which categorized learners according to auditory, visual, read/write and kinesthetic modalities<sup>2,3</sup>. Pask divided into serialistic and holistic learners. Kolbe's experiential learning model identified students as convergers,

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Received: 31 Jan 2019; revised received: 06 May 2019; accepted: 06 May 2019

divergers, assimilators and accommodators based on bipolar construct<sup>3</sup>. Honey and Mumford classified learners as activists, reflectors, theorists and pragmatists<sup>3</sup>.

The approaches to learning were derived from Marton & Saljo's work and further developed by Entwistle & Ramsden's descriptions of three categories: Deep, Surface and Strategic approach<sup>4</sup>. The characteristic of Deep approach is the internal motivation where students analyze critically and understand the concepts and principles leading to long term retention<sup>1</sup>. This approach enables student to associate prior knowledge with recent and get a clear picture in mind<sup>6</sup>. Entwistle, MCune and Walker suggest that deep approach monitors the development of understanding in a student. Surface approach is superficial where main focus is memorization of information instead of comprehension, leading to superficial retention of knowledge<sup>1</sup>. Students with this approach are interested in acquiring the qualification instead of understanding the concept and subject<sup>9</sup>. In strategic approach focus of learners is to ensure high grades in assessment by organizing their work and time management<sup>2</sup>. Several studies have explored the association between learning approach and academic performance in undergraduate students. It is important to know the learning approach of undergraduate and postgraduate students as the demand of our profession is regular update of knowledge and problem solving skills<sup>4</sup>. Studies done earlier have shown different modes of learning among medical students in different parts of the world. As there is change from undergraduate to post-graduate level, students find difficulty in coping with extensive syllabus along with problem solving skills.

Minimal published data is available in our population, thus the rationale of our study is to find out the difference in learning approaches of final year MBBS and during different years of postgraduate residency program students and thus to improve academic outcomes.

## METHODOLOGY

This concurrent mixed method study in pragmatic paradigm was conducted to analyze quantitatively the learning approaches of final year and post graduate trainees of King Edward Medical University, Lahore-Pakistan; and to explore, through qualitative in-depth interviews of postgraduate residents, if learning approaches changed from undergraduate to postgraduate levels.

A total of 200 participants were included after approval from Institutional Review Board, King Edward Medical University Lahore. 100 final year MBBS and 100 postgraduate students of various specialties were included for quantitative analysis in the study who volunteered to participate by non-probability purposive sampling technique. After informed consent participants were approached during work hours. In all instances, participants were briefed about the objectives of the study, and confidentiality of responses were ensured by maintaining anonymity of responders.

"ASSIST" Questionnaire (quantitative instrument) was used to identify student's characteristic orientation to studying as either "deep", "surface", "strategic" and also to find the correlation of gender with preference of study approach. ASSIST Questionnaire is a revised version of the ASI developed by Entwistle and his colleagues at Lancaster University in the late 1970s and a product of the Enhancing Teaching-Learning Environments in Undergraduate Courses (ETL) team<sup>11</sup>. The English version of ASSIST has been validated by Byrne *et al*<sup>11</sup>. Respondents answered the questionnaire using 5 point modified Likert scale (1=strongly disagree, 2=disagree somewhat, 3=unsure, 4=agree somewhat and 5=strongly agree). This contains 52 statements combined into 13 subscales of four items each, which are then further grouped into the three main scales: Deep Approach (DA), Strategic Approach (SA), and Surface Apathetic Approach (SAA). Deep Approach was obtained by a total of four subscales: Seeking Meaning (SM), Relating Ideas (RI), Use of

Evidence (UE) and Interest in Ideas (II). Subscale of Strategic Approach included Organized Studying (OS), Time management (TM), Alertness to Assessment demands (AA), Achieving (A), and Monitoring Effectiveness (ME). Surface Approach comprised of Lack of purpose (LP), Unrelated Memorizing (UM), Syllabus Boundness (SB) and Fear of Failure (FF).

Sub-scale scores were formed by adding together the responses on the items in that sub-scale. Scores on the three main approaches were created by adding together the sub-scale scores

approach changed from undergraduate to postgraduate levels. Qualitative data was collected through in depth semi-structured interviews of postgraduate students by use of purposeful maximum variation sampling technique. Individual interviews of willing postgraduate students from different specialties were planned to explore if there was a change in learning approach and how it occurred from undergraduate to postgraduate level. Participants were briefed about the objectives of the study and the interviews were audio recorded. Data saturation was achieved after eight interviews

**Table-I: Learning Approaches of Under-Graduates and Post-Graduates, UG (Undergraduates) and PG (Post graduates).**

	Group	n	Mean ± SD	Std. Error Mean	p-value
Deep =SM+RI+UE+II	PG	100	63.01 ± 8.455	0.845	p=0.05
	UG	100	60.81 ± 7.426	0.743	
Strategic=TM+AAD+A+ME	PG	100	74.67 ± 12.240	1.224	p =0.801
	UG	100	74.24 ± 11.814	1.181	
Surface=LP+UM+SB+FF	PG	100	52.49 ± 12.524	1.252	p=0.629
	UG	100	51.70 ± 10.496	1.050	

PG: Post Graduate, UG: Under Graduate

**Table-II: Gender based Learning Approaches of Under-Graduates and Post-Graduates.**

Gender	Group	N	Mean ± SD	Std. Error Mean	p-value	
Female	Deep=SM+RI+UE+II	PG	39	61.77 ± 8.677	1.389	p=0.463
		UG	48	60.58 ± 7.322	1.057	
	Strategic=TM+AAD+A+ME	PG	39	75.31 ± 10.198	1.633	p=0.812
		UG	48	75.88 ± 11.710	1.690	
	Surface=LP+UM+SB+FF	PG	39	50 ± 12.666	2.028	p=0.359
		UG	48	52.23 ± 9.9	1.429	
Male	Deep=SM+RI+UE+II	PG	61	63.80 ± 8.284	1.061	p=0.067
		UG	52	61.02 ± 7.586	1.052	
	Strategic=TM+AAD+A+ME	PG	61	74.26 ± 13.450	1.722	p=0.525
		UG	52	72.73 ± 11.821	1.639	
	Surface=LP+UM+SB+FF	PG	61	54.08 ± 12.272	1.571	p=0.198
		UG	52	51.21 ± 11.092	1.538	

PG: Post Graduate, UG: Under Graduate

which contribute to each approach. The highest mean was taken to indicate the predominant learning approach in students. Data was analyzed using SPSS-20. Descriptive statistics such as mean ± SD, frequency and percentage were calculated. Student’s t-test was used for statistical comparisons.

Qualitative component of this mixed method study was used to explore how learning

and further two interviews were conducted to confirm saturation. Thematic analysis was done for data reduction and interpretation. The method of triangulation was used for validation and comments verbatim are given for confirmability. Quantitative data was analyzed by using SPSS-23. Mean ± SD were calculated for continuous variables. T-test was applied for comparison. A p-value<0.05 was considered significant.

## RESULTS

The Mean age in undergraduate students was  $23.24 \pm 0.95$  years (male 52% & female 48%) and  $28.5 \pm 2.3$  years in postgraduate students (male 61% & female 39%). Mean scores of each group for each approach are shown in table-I. No significant difference was seen in mean scores for deep approach between groups.

No significant difference was seen in the selection of approach among the females and males of both groups (table-II). Interviews indicated a change in approach from surface to

the approach to learning changed from undergraduate to postgraduate level?). ("In third and fourth year of residency I changed my approach to learning. Discussion with teachers and colleagues, team work and ward assessment helped me to understand in depth"). The major themes identified were clinical exposure, teaching methodology, clinical environment, role of supervisor and assessment techniques. Categories of each theme that led to change along with comments verbatim are given in table-III.

Six out of ten postgraduate students did not

**Table-III: Thematic analysis results with comments verbatim.**

Theme	Sub-theme	Comments Verbatim
Clinical Exposure	Hands on experience	"When you treat you observe the effects." (Participant 3) "As undergraduate we do not have hands on experience." (Participant 3)
	Direct contact with patient	"I am in direct contact with patient. I experience instantly." (Participant 4)
	Direct application of knowledge	"I read and apply directly on patient." "As undergraduate I read to pass the exams. Do not apply directly to patient." (Participant 5)
Teaching Methodology	Ward rounds	"Morning ward rounds improve the knowledge. Teacher ask questions."
	Group discussion	"In group discussion I understand deeply as against at undergraduate level there was no group discussion." (participant 1)
	Weekly interactive lecture	"I question in lectures." (Participant 2)
Clinical Environment		"It is facilitating. Peers attitude helped me to learn." (Participant 2) "As undergraduate individual attention is not given by teacher because of a large class." (Participant 8)
Role of Supervisor	Facilitative	"Supervisor facilitating and helpful." (Participant 4)
	Motivating	"He has experience and exposure which motivates us." (Participant 5)
	Available	"She was always available." (Participant 6)
Assessment	Regular Tests	"Chapter wise tests were effective. They tell us about exam pattern and are helpful." (Participant 1)
	TOACS	"This gives the confidence to answer in exams." "At undergraduate level no TOACS conducted." (Participant 6)

deep in four out of ten postgraduate students. ("As undergraduate my objective was to pass the exam. In the first and second year of residency I studied like an undergraduate student"). They used to memorize subject to pass the exams at undergraduate level ("What are the learning approaches in final year and postgraduate students?").

But they acquired deep approach after becoming a postgraduate student ("How have

find a change in their approach from undergraduate level ("As undergraduate I used to understand and clear my concepts about the subject. I did not memorize. As postgraduate student I did the same and made my concepts clear and looked for evidence while studying"). The change which the students found from undergraduate level was a hands on experience with patients, conducive clinical environment, teaching and assessment methodology and

facilitating supervisor. The intrinsic motivation and application of knowledge directly on patients was one of the factors that made them deep learners.

## DISCUSSION

Recent trends in medical education has acknowledged the importance of understanding the student's different learning approaches to study. Learning approaches exert influence on teaching-learning process in medicine<sup>6</sup>. The learning approach of student depends on attitude, aptitude, curricular strategies and academic environment<sup>12-15</sup>. Student's approach to learning has always been a concern for medical teachers as it enhances or impairs educational outcomes<sup>16</sup>.

A change in the methods of study and learning approach is required by the student for better understanding of concept and content<sup>17</sup>. It has been observed that students approach to learning may change during the course of medical education if efforts are made to bring about that change. Some changes in curriculum such as student centered method, active educational strategies, and different types of assessment can enhance learning process by shifting to deep approach from surface approach<sup>6</sup>.

Evaluation of approach to learning is important in medical education for understanding and long term retention of concepts, integration and linking of principles and knowledge for problem solving clinical scenarios. The objective is to make students deep learners with the help of aligning the teaching with assessment methods<sup>18</sup>. Knowledge of student's learning approaches will guide teachers to devise teaching strategies that would motivate students in improving academic performance and mastering professional skills<sup>2,9</sup>. The awareness of student's learning approach will help medical teachers to identify the students at risk and thus to improve their teaching strategies<sup>19</sup>.

This study was carried out to find the type of learning approach in final year MBBS and

postgraduate medical students of KEMU and to explore how the change in learning approach occurred during transition from undergraduate to postgraduate phase by interviews. The preference for learning approach by male and female students was also assessed. Themes emerging from interviews for deep learning centered on clinical exposure, teaching methodology, clinical environment, role of supervisor and assessment methodology.

The triangulation of data lead to convergent results of our study. The medical students used deep and strategic approach with predominance of strategic in undergraduate students. Postgraduate students did not show a significant difference for deep approach ( $p=0.05$ ) as information collected in questionnaire and interviews. ("I used to study in depth and make concepts. I read different books and discussed with teachers to understand deeply"). The meaning is that the student used to study thoroughly with great attention and in detail. A few postgraduate students revealed the change from strategic to deep approach. ("As undergraduate I used to memorize to get marks and pass the exams. But when I became a PG I read, tried to understand and applied the knowledge. Discussion with teachers helped me to understand deeply").

Chonkar *et al.* conducted a study to determine the predominant learning approaches in medical students and found that 50.8% undergraduate medical students adopted the strategic as their predominant learning approach<sup>18</sup>. Another study conducted by Samarakoon *et al.* in Sri Lanka also found that the strategic learning was the predominant learning approach in all pre-clinical and clinical students. ( $p<0.05$ )<sup>5</sup>. The results of both studies are comparable to our study done on medical students of our institution. In contrast to our study results, Shaik *et al* found preference of deep approach in students of first three years of King Saud Medical University which could be due to a different curriculum structure<sup>19</sup>.



Results of Wickramasinghe *et al* found highest mean scores for deep approach in postgraduate students and surface apathetic approach in final year medical students<sup>14</sup>. Post graduates had significantly higher scores for deep approach in the study by Samarakoon *et al* when compared to undergraduates (61.15 vs 55.92)<sup>5</sup>. Both these study differ as our quantitative results were borderline although insignificant statistically but qualitative analysis showed a tendency towards deep approach in postgraduate students.

D'cruz *et al* concluded that majority (87.1%) of medical students in South India had a deep approach in learning before starting clinical posting<sup>8</sup>. Soundariya *et al* carried out a study in Department of Physiology of Sri Manakula Vinayagar Medical College and Hospital, Puducherry. They found that most of medical students adopted deep approach<sup>2</sup>. The results of both studies are in contrast to our study results where medical undergraduates had shown a strategic approach. The difference could be due to pre-medical educational strategies.

The study by Paudel *et al* at Trinity School of Medicine showed higher mean scores for deep learning approach than the mean scores for surface approach ( $29.4 \pm 4.6$  vs.  $24.3 \pm 4.2$ ) among medical students<sup>15</sup>. Zakaria *et al* in their study on Approaches of Learning among Medical Undergraduates of Faculty of Medicine and Health Sciences, Universiti Putra Malaysia found that 49.6% preferred deep approach<sup>9</sup>. Both these observations do not agree with our study results as mean score for deep approach was lower than strategic approach in our students. The difference could be due to lack of time for in depth study.

Contrary to our study results Shah DK found medical students to have significantly higher scores for deep approach in comparison to dental and nursing students<sup>1</sup>. This could be due to variation in instructional methodologies and emphasis on assessment. Mirghani *et al* also in their study concluded that Sudanese final year students preferred deep approach in their learning. This difference from our study could be

due to the questionnaire they used for their study (DREEM vs ASSIST)<sup>20</sup>.

A number of studies have analyzed the influence of gender on learning approach. In our study the correlation between gender and preference of learning approach is not significantly different among groups. This is consistent with findings of Wickramasinghe *et al* and Shah DK who did not find variation in learning approaches among males and females<sup>1,14</sup>. Similar to our results, Soundariya *et al* showed statistically significant difference in adoption of strategic approach by females<sup>2</sup>. In contrast to our study Zakaria *et al* showed significant association between gender and selection of learning approach. Both males and females adopted deep approach<sup>9</sup>. Mirghani *et al* found statistically significant preference for deep approach by females in contrast to adoption of strategic approach in females of our population<sup>20</sup>.

Training undergraduate students for deep approach will not only maximize learning but will also benefit them in achieving problem based learning skills. Subhasinghe *et al* in their study demonstrated that undergraduate students with deep learning showed better academic performance than those who had a superficial learning approach<sup>21</sup>. Win may *et al* found a positive impact on grades by students who had a deep learning approach<sup>22</sup>. Kayali studied the impact of learning approaches on academic performance and found deep learners with high academic outcome<sup>23</sup>. Similar results were observed by Mc Manus *et al* and Mattick *et al* who showed in their studies that students with deep approach performed better in final exams<sup>6</sup>. Some of the postgraduate students changed their approach from strategic to deep approach with hands on experience, direct contact of patients, regular tests and facilitating role of supervisor. Faculty can acquire teaching and examination methods that discourage superficial approach and motivate students towards deep approach.

## LIMITATION OF STUDY

It was conducted in King Edward Medical University only, which has the highest merit at the time of medical college admissions, and results cannot be applied on entire population since the student's approaches would be dependent on teaching context in each specific institution. Future studies may be conducted to ascertain if institutions with lower merit also have similar strata of learners and also to find the correlation of learning approach with academic performance.

## ACKNOWLEDGEMENT

We would like to thank the students who participated in the research and the faculty who helped during data collection.

## CONCLUSION

This study suggested the predominance of strategic approach in medical undergraduates and deep approach in postgraduate students. The postgraduates changed their style of learning as compared to undergraduate studies because of clinical exposure, teaching methodology, clinical environment, assessment methods and role of facilitator. Gender has no influence in selection of learning approach. Further, better understanding of learning styles paves the way for improving quality of teaching and learning attitudes among medical professionals.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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