RESEARCH ARTICLE

Dissecting the understanding of students about our teaching methods: A single institute, analytical cross-sectional study

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Abstract

Objective: To measure the perception of medical students regarding different methods of active learning, and its association with the year of study.

Method: The analytical cross-sectional study was conducted at Shalamar Medical and Dental College, Lahore, Pakistan, from May to September 2020, and comprised medical students of either gender from first to final year of studies. Data was collected using an online questionnaire regarding different methods of active learning and e-learning. Perceptions and their association with the year of study were worked out. Data was analysed using SPSS 16.

Results: Of the 270 subjects, 155(57.4%) were females and 115(42.5%) were males. Overall, 39(14.4%) students were from the first year of studies, 32(11.9%) second, 47(17.4%) third, 120(44.4%) fourth and 32(11.9%) were from the final year of medical studies. Most students preferred class lectures as the teaching method of choice 240(89%), followed by small group discussions 156(58%). Students showed positive perception of different learning methods except e-learning 78(28.89%). The association between perceptions and the year of study was statistically significant ($p < 0.05$).

Conclusion: Students apparently enjoyed using different interactive methods, but were apprehensive about online learning.

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Introduction

As the understanding of health and disease has evolved over time, so has the approach towards medical education. Medical education can no longer be perceived as a mere amalgamation of basic science subjects with clinical application. An understanding of students' perception of their own education and the factors influencing it is also necessary for medical education to be effective.[1] Multiple strategies have been used to plan and strategise medical curriculum under the student-centred; problem-based learning; integrated teaching; community-based; electives and systematic (SPICES) mode.[2] To practically implement the teaching for understanding (tfU) concept of education, various methods and techniques of active learning/ teaching must be utilised, using a system of multi-modality integration.[1]

An overview of literature shows the significance of active learning methods (ALMs) in the development of better comprehension of topics, improvement in teamwork and discipline, and an increase in utilisation of creative thinking for solving clinical problems.[3] Active learning (AL) is a term that embraces learning which engages the students and gives them the driving role. By using different AL modes, students are better engaged in their studies even for extensive subjects, like anatomy.[4] For instance, problem-based learning (PBL) is one of the popular methods. Evidence suggests that PBL and other such techniques make medical education palatable and practical.[5] It is, however, noteworthy that contrary to the observed benefits of various teaching methodologies, students' perception towards them may be negative. A cross-sectional study in Vellore, India, exhibited that despite being beneficial, students were apprehensive towards using methods like self-directed learning (SDL).[6]

In Pakistan, there are more than 150 medical colleges and universities. A great proportion of these have shown willingness to move towards a student-centred approach.[7] Though praise-worthy, this transition towards integrated medical education may cause confusion and restlessness amongst students. Negative perception towards the teaching methods used leads to a poor quality of life (QOL) amongst medical students, which, in turn, negatively impacts their performance in the clinical field.[8] Hence, it is essential to study the perception of medical students, to identify gaps in medical education, and to create dialogue amongst all stakeholders.[9]

An effective change in the medical education system can only be made by considering individual feedback and learning needs, and then modifying the teaching methods accordingly.[10] The current study was planned to measure the perception of medical students regarding different

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ALMs, and its association with the year of study. The null hypothesis was that there would be no association between the year of medical education and students' perception of ALMs.

Subjects and Methods

The analytical cross-sectional study was conducted at Shalamar Medical and Dental College (SMDC), Lahore, Pakistan, from May to September 2020. After approval from the institutional ethics review board, the sample size was calculated in line with literature using the formula:[11] n= {Z2P (1-P)}/d2. With a total of 750 medical students on the roll, 50% proportion of success and 0.05 margin of error, the required sample size was 256. The sample was raised using convenience sampling technique. Those included were medical students from first to final year of studies. Those not willing to participate were excluded.

After taking consent from the subjects, data was collected using a questionnaire designed in the light of literature[4,6-8] and developed through Google Forms. The questionnaire was pretested on a group of 4th year students. Subsequently, it was disseminated through social media platforms. Students were asked questions about different ALM types, like small group discussions (SGDs) or tutorials, PBL, bed-side teaching, peer-teaching, laboratory or experiment classes, SDL, and e-learning done through Shalamar E-learning Management System (SeLMS), which enables all students to login through their institutional email addresses and have free access to all the lectures and materials. SeLMS uses Moodle, a free, open-source learning management system[12] for its operation which enables online tests, and students can also upload assignments on the system.[13] For comparison, conventional class lectures were also added. The questions were answer on a Likert scale; 1 = not at all, 2 = not sure and 3 = definitely. Seven of these questions related to different methods of teaching were then re-coded into three categories for the ease of understanding: 15-21 = positive perception, 9-14 = neutral perception and 3-8 = negative perception.

Data was analysed using SPSS 16. Categorical variables were expressed as frequencies and percentages. Pearson's chi-square test was used as appropriate. P<0.05 was considered statistically significant.

Results

All the 270(100%) students approached responded. There were 155(57.4%) females and 115(42.5%) males. Overall, 39(14.4%) students were from the first year of studies, 32(11.9%) second, 47(17.4%) third, 120(44.4%) fourth and 32(11.9%) were from the final year of medical studies.

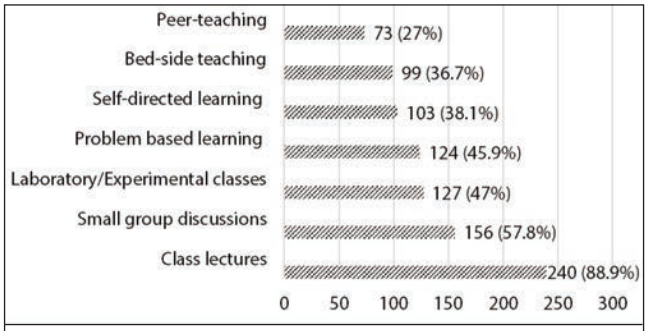

Figure: Different methods of learning used at Shalamar Medical and Dental College (SMDC).

Table-1: Perceptions of students regarding different methods of active learning.

Active learning methodologies (Which of the following is best for active learning?)	n (%) Positive perception	Neutral perception	Negative perception
Class lectures	159 (58.8)	64 (23.7)	47 (17.4)
Small group discussions/Tutorials	186 (68.88)	39 (14.44)	47 (17.4)
Problem-based Learning	142 (52.59)	59 (21.85)	69 (25.55)
Self-directed Learning	151 (55.93)	50 (18.52)	69 (25.55)
Laboratory/Experimental classes	172 (63.70)	58 (21.48)	40 (14.81)
Peer teaching	181 (67.03)	52 (19.26)	37 (13.70)
Online Learning			
Adequate transfer of knowledge through E-learning	78 (28.89)	78 (28.89)	114 (42.22)

Most students preferred class lectures as the teaching method of choice 240(89%), followed by small group discussions 156(58%) (Figure).

Overall, most students had a negative perception 213(79%), with a mean score of 2.76±1.4. When inquired individually about different ALMs, 186(68.8%) students showed a positive perception towards SGDs, while a negative perception prevailed towards SeLMS towards it 14(42.2%) (Table 1).

The association between perceptions of ALMs and the year of study was statistically significant ($p<0.05$), with 4th year students being more receptive of e-learning than the rest, and final year students being the most averse (Table 2).

Discussion

Different angles and perspectives are explored every day to ensure a better understanding of improvements needed in medical education. In Pakistan, medical education still has a long way to go before it may catch up with global standards.[9] The current study was planned to analyse the perceptions of students in a private medical college about the teaching methods used.

AL encompasses many modalities, including, but not

Table-2: Association between different modes of active learning and year of study.

Best for active learning	Perceptions	M.B.B.S. Year [n (%)]					*p*-value*+
		First	Second	Third	Fourth	Final	
Class lectures							0.006
	Positive	29 (74.4)	23 (71.9)	23 (48.9)	62 (51.7)	22 (68.8)	
	Neutral	6 (15.4)	8 (25)	9 (19.1)	37 (30.8)	4 (12.5)	
	Negative	4 (10.3)	1 (3.1)	15 (31.9)	21 (17.5)	6 (18.8)	
Small group discussions/ Tutorials							0.007
	Positive	27 (69.2)	24 (75.0	20 (42.6)	90 (75.0)	23 (71.9)	
	Neutral	6 (15.4)	2 (6.3)	11 (23.4)	17 (14.2)	3 (9.4)	
	Negative	6 (15.4)	6 (18.8)	16 (34.0)	13 (10.8)	6 (18.8)	
Problem-based Learning							0.005
	Positive	21 (53.8)	16 (50.0)	14 (29.8)	69 (57.5)	22 (68.8)	
	Neutral	8 (20.5)	6 (18.8)	15 (31.9)	25 (20.8)	5 (15.6)	
	Negative	10 (25.6)	10 (31.3)	18 (38.3)	26 (21.7)	5 (15.6)	
Laboratory/Experimental Classes							0.008
	Positive	31 (79.5)	26 (81.3)	19 (40.4)	74 (61.7)	22 (68.8)	
	Neutral	5 (12.8)	3 (9.4)	17 (36.2)	28 (23.3)	5 (15.6)	
	Negative	3 (7.7)	3 (9.4)	11 (23.4)	18 (15.0)	5 (15.6)	
Peer-Teaching							0.01
	Positive	31 (79.5)	24 (75.0)	21 (44.7)	86 (71.7)	19 (59.4)	
	Neutral	4 (10.3)	7 (21.9)	14 (29.8)	18 (15.0)	9 (28.1)	
	Negative	4 (10.3)	1 (3.1)	12 (25.5)	16 (13.3)	4 (12.5)	
E-learning							0.01
	Positive	8 (20.5)	8 (25.0)	13 (27.7)	46 (38.3)	3 (9.4)	
	Neutral	9 (23.1)	6 (18.8)	9 (19.1)	41 (34.2)	13 (40.6)	
	Negative	22 (56.4)	18 (56.3)	25 (53.2)	33 (27.5)	16 (50.0)	

*as calculated by Pearson's chi-square; + positive perception and negative perception are statistically different; <0.05 statistically significant; MBBS: Bachelor of Medicine, Bachelor of Surgery.

limited to, live demonstrations, using peers as teachers, project-based learning, experimental classes, and SGDs.[14] Technology-enhanced active learning (TEAL) includes virtual patient simulations, online video games and other forms of e-learning.[15] McCoy et al. studied these methods in southwest United States and reported that debates along with discussions were the the most used method, followed by case-based instruction. In our setup, however, class lectures and tutorials dominated the choice spectrum.

The study found that most students liked different AL techniques (Table 1). The finding was comparable to an earlier study.[16] The study, like ours, investigated comprised millennials, who as a generation, are known to be more goal-oriented and passionate.[17] They know how to use technology as they were brought up with it. They face an overwhelming amount of pressure to succeed, and, thus, gravitate towards taking the reins of their education in their own hands.[17]

Earlier studies, however, showed that despite having better outcomes, students exhibited negative AL perception[18] which might be due to poorly designed and executed curriculum. The quality of the curriculum delivered, and the physical space used affects the participation of students even with ALMs.[18]

A major contrasting factor between the current study and the one done in 2016[16] is the level of students involved. The earlier study only had 1st and 2nd year mdical students, while the current study had participants from all the five years. This is important because perceptions of students change over time.[9] It is also dependent upon the years of exposure of different types of pedagogies. With time, students get comfortable with different teaching methodologies and develop a better understanding of how to put it to good use.[19] Liking or disliking of a particular method may also be dependent on personal preferences.[19] In the current study, the year of academic studies was significantly associated with ALM perceptions (Table 2).

After moving from pre-clinical years 1 and 2 to clinical year 3 or 3rd year, students showed a significant negative outlook on AL. In the 3rd year, they get introduced to new methods of teaching, like bed-side learning, and it may take some time for them to get used to it. It is the year when medical students may not really grasp Al concept and its different categories.[19]

Facilitators from clinical years also deal with a lack of time to properly train and teach.[19] Their clinical duties become a hurdle towards AL of their students. Students at this stage may also perceive that their teachers are the ones who do comprehend fully AL meaning and strategy.[20]

Addressing this issue, others[21] reported that SDL requires active participation from the facilitators. Self-regulation or self-direction can have a huge impact on students' QOL as it encircles behavioural, emotional, cognitive and meta-cognitive aspects of learning.[22] In the current study, the students showed a positive outlook towards SDL (56%), but it has been suggested that a co-regulated model can improve the execution, and, hence, its perception.[21] In a co-

regular model, students do take the central role in their learning, but with constant coordination with an experienced senior of that field.

While the current study was still in its initial phase, the coronavirus disease-2019 (COVID-19) pandemic hit the world and made online learning a necessity.[23] Online learning was never explored before as the sole teaching methodology even though efforts had been made previously to come up with a framework for effective learning. The Sloan Consortium had laid down five pillars for this very purpose.[24] The current study gauged one of those pillars; students' satisfaction.

A study in France recently assessed two of the five pillars, and showed similar results.[25] Even though its students agreed that e-learning in a pandemic was inevitable, most of them (58.6%) expressed that it did not match the anticipated standard of quality. This can be attributed to various factors. Firstly, there might be a lack of comprehension, sensitisation and training of students and teachers regarding remote ways of pedagogy. As students of pre-clinical years have very crude idea of medical education, they seem to the ones having the most negative perception regarding e-learning (Table 2). Normalising the remote method of medical education means continuous assessment and feedback from the teachers and students alike so that corresponding optimisation can be done.[26]

Another element is that the students miss interacting with the faculty and peers. The students in the current study demonstrated an inclination towards ALMs, but had a negative view of e-learning, which shows that the element of interacting with other human beings live has a great impact on human learning and perceptions. It has been suggested recently that students show better inclination of e-learning when combined with interactive live learning.[27] During pandemic-related lockdowns, this might not have been possible, but synchronous lectures instead of pre-recorded ones can contribute towards a better outcome.[25]

The current study has several limitations. It was a cross-sectional survey done at a single centre using a self-constructed questionnaire that lacked a systematic approach towards assessing validity.

Conclusion

Majority of the students showed a positive perception of SGDs, followed closely by peer-teaching. Looking at the overall trend, a positive perception towards different ALMs was observed. Students from the newer generations tended to gravitate towards ALMs, but this inclination was found to be associated with the year of studies.

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