

Access this article online
Quick Response Code:

Website: <a href="http://www.jehp.net">www.jehp.net</a>
DOI: 10.4103/jehp.jehp_95_19

# Learning styles and approaches among medical education participants

Noreen Maqbool Bokhari, Mubashir Zafar<sup>1</sup>

## Abstract:

**PURPOSE:** There are different learning styles adopted by medical education participants. The aim of this study is to investigate which learning styles and approaches are preferred to be learnt by medical students.

**METHODOLOGY:** It is a cross-sectional study; 320 students were selected through stratified random sampling. Visual, auditory, read/write, and kinesthetic questionnaire was used which measures dimension of learning styles and approaches.

**RESULTS:** Majority of medical students have preferred (32%) for Kinesthetic modality; 26% for Aural; Visual 21% and Reading/Writing 21%. The majority (53%) preference for Bimodal modality; 41% for Unimodal; 5% for Trimodal and 1% for Multimodal.

**CONCLUSION:** Medical education participants commonly used kinesthetic styles, and there is no difference among different year of study; but, in learning approach, multimodal has increased as year of studying increased. It suggests that curriculum of medical education should be revised according to result of research.

## Keywords:

Learning, medical education, multimodal, styles, visual

## Introduction

There are different types of learning methods which differ among medical students.<sup>[1]</sup> There is different advancement in medical education for in 21<sup>st</sup> centuries. The medical education requires high burden of knowledge to the students which is very difficult to retain in the memory.<sup>[1]</sup> There are different types of teaching methods in medical education which goal to improve the learning process of students and change from traditional method to student's center approach of learning. There are numerous learning methods in medical education from didactic teaching to problem-based learning. Most medical schools adopted problem-based learning which is student's centered and high rate of retaining the knowledge in memory.<sup>[1]</sup> Various educational theories

were found that students performance had related to learning methods but learning methods were different between secondary school and graduate students. Graduate students were more emphasizing in critical thinking in learning.<sup>[2]</sup>

There are different learning methods such as visual, Aural, Kolb's learning and models of learning were developed.<sup>[3]</sup> They have differences in multimodal learning style visual learning and kinesthetic learning.<sup>[4]</sup> Awareness of student learning style could provide a basis to optimize teaching method. Learning style diversity can enable more students to achieve success.

Visual, auditory, read, and kinetics (VARK) learning style does not involve intelligence or inherent skills but is closely related to how we acquire or understand information or new knowledge. It can be used for acquiring knowledge, positive skills, and attitude.<sup>[5]</sup>

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: [reprints@medknow.com](mailto:reprints@medknow.com)

**How to cite this article:** Bokhari NM, Zafar M. Learning styles and approaches among medical education participants. *J Edu Health Promot* 2019;8:181.

Department of Community  
Medicine, Khawaja  
Muhammad Safdar  
Medical College, Sialkot,  
Pakistan, <sup>1</sup>Department  
of Public Health, College  
of Public Health, Imam  
Abdul Rehman Bin Faisal  
University, Dammam, KSA

## Address for correspondence:

Dr. Mubashir Zafar,  
Department of Public  
Health, College of Public  
Health, Imam Abdul  
Rehman Bin Faisal  
University, Dammam,  
KSA.  
E-mail: [mzzahmed@iau.edu.sa](mailto:mzzahmed@iau.edu.sa)

Received: 20-02-2019

Accepted: 09-07-2019

Majority of medical students used multimodal for learning. No gender and academic performance were associated with learning style preference.<sup>[6]</sup> Medical students used all types of styles for learning, but majority used Aural modal. Curriculum of institution is associated with different learning styles.<sup>[7]</sup> Student participation is the important tool in which students prefer the type of learning.<sup>[8]</sup>

There is a strong relationship between the learning style preferences and academic achievements<sup>[9]</sup> learning styles help teachers to facilitate students effectively. Moreover, students itself find the best method of learning and get good performance in the academics. Most of higher education students continually improved or changed the learning styles for getting good performance in their academics. Most of the students follow the learning styles of good students especially in higher education.<sup>[9]</sup>

The trend in medical education in Pakistan is facilitator-adopted traditional way of teaching.<sup>[3]</sup> Teaching instructors conducted their lectures through traditional way of teaching like didactic way of teaching because their training and knowledge had good results.<sup>[3]</sup> Professional learning provide the guideline for learning but, students follow the learning methods which was adopted by successful students.<sup>[4]</sup>

Every student has different learning styles and that is the reason why classrooms are a diverse group of students in aspect of acquiring knowledge. While acquiring a huge amount of knowledge in medical colleges, medical students in Pakistan experience a different learning environment than non-medical students. Studies have shown that each student typically adapts his, or her learning preferences to their learning environment.<sup>[4]</sup> Styles of learning are as important as intellectual ability and ignoring it will put learning to jeopardy. Learning medical education in Pakistan is more self-directed than a dependent form of teaching-learning. In Pakistan, there are different private and public sector medical colleges, in which different curriculums were present and they provide different learning environment. There are different studies which found that medical students follow different learning styles according to their learning environment.<sup>[4]</sup> Styles of learning are as important as intellectual ability and ignoring it will put learning to jeopardy. Medical students' awareness is important factor for improving the medical education quality; if the method of information delivery to them conforms to their learning style, they will learn better.<sup>[5]</sup>

The aim of this study is to determine the learning styles and approaches among medical education students. Medical profession is the pioneer of all profession

because its quality depends on the health status of the country. Very few studies were conducted to determine the learning styles and approaches among medical students; There are minimal published data on learning styles and approaches among undergraduates' medical schools in Pakistan. There are many methods of learning and assessments include a significant continuous assessment component from which the curriculum utilizes. The final assessment is a criterion-referenced qualifying examination. We thus hypothesized that there would be significant differences in learning styles and learning approaches seen in students; i.e., some students would be expected to favour auditory and read/write learning styles and strategic learning, while some students would be expected to switch to multimodal learning styles with greater emphasis on deep learning. This study will helps out the which methods is preferred for learning medical knowledge. The objective of study this study is to determine which method of learning among medical students in Sialkot, Pakistan.

## Methodology

### Study Design, Sample technique, Sample size and Data collection procedure

It's a Cross-Sectional Study, students were selected through stratified random sampling (divide the students into five strata according to year of education i.e., from 1 year to 5 year) and sample size were calculated through WHO statistical software, total 320 students were selected. The study instruments used were validated visual, auditory, read/write and kinesthetic (VARK) questionnaires (version 7.8). The questionnaires were distributed to students in the first year to final year during lectures and practical sessions. Every steps of data collection, study participants were briefed and confidentiality of participants information was ensured by maintaining anonymity of responders. It consists of 16 questions with 4 choices, each of which corresponds to a sensory modality preference. Students were free to select one or more than one option, thus varying combinations of multiple sensory modalities could be obtained. The preferred sensory modality was the one that received the highest marks. The questions describe circumstances of everyday occurrence; thereby connecting to a person's learning experience. Students were instructed to encircle the letter next to the option that best explained their preference. They could opt for more than one choice or leave vacant any question if they perceived it as being not applicable to them. Questionnaires were assessed based on previously validated scoring instructions and a chart as each of the options exemplifies a sensory modality preference; the same was calculated for every individual by summing up the responses for all 16 questions. The entire exercise

was completed in less than 30 min, after which the students returned the questionnaire with demographic data.

### Data analysis

Study participants response was scored which is present in the questionnaire, then identify the preferred learning approach and then identify the model of learning according to sub scale scores. All data were entered in to a SPSS database. SPSS v22 was used for data analysis and statistical Student's T-test was used for statistical comparisons.

### Ethical statement

Informed consent was obtained from this study's participants, Ethics clearance for the project was obtained from the Ethics Review Committee of the Faculty of Medicine, medical college.

## Results

### Demographic data

A total 320 students participated in the study, mean age of students was 21.11 years (Standard Deviation  $SD \pm 1.83$ ). Each year 64 (20%) of students were selected, male: female ratio of participants was 1:1.2 with 89 (27.8%) male participants and 231 (72.2) female.

### Learning Styles

Out of 320 medical students 53% have Bimodal learning modalities; 41% have preferred Unimodal learning modalities while trimodal 5% and Multimodal 1% preferences [Figure 1 and Table 1].

### Learning style models' preference by year of students

Majority 46.8% of the first-year students had unimodal learning styles, second year 17.92% had bimodal, third year 15.36% had bimodal, fourth year 12.8% had bimodal and final year student's majority (13.44%) preferred multimodal approach [Table 2].

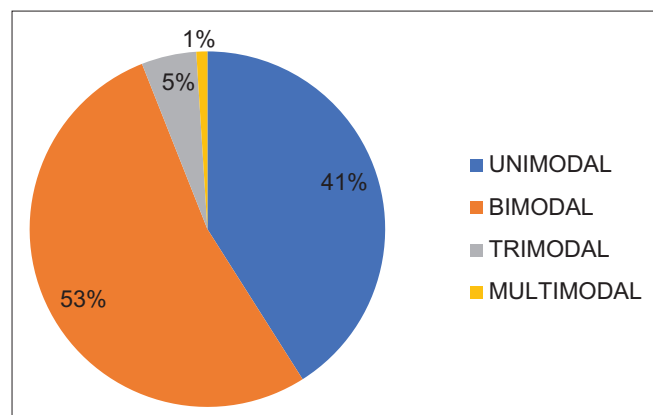


Figure 1: Learning models' distribution among medical students

### Graphic representation of the VARK inventory results for learning styles among students

Most of the first, second, third, fourth and final-year students had 31.93%, 32.27%, 31.83%, 32.09% and 31.26% were in favor of Kinesthetic Learning respectively [Figure 2].

## Discussion

The study found that 1<sup>st</sup> year students were using unimodal learning approach as year of study increased; the students were shifted toward multimodal of learning.

Result of this study found that bimodal of learning styles with auditory learning is the most common among medical students. Result of this contrast with the previous study which showed that 63.8% of students had multimodal learning styles' preference and auditory styles was preferred.<sup>[10]</sup> The main difference is the difference of curriculum and learning environment. Other study found that majority (63.9%) of students had preferred multimodal learning styles and 3.2% being

Table 1: Comparison of learning styles' scores among medical students (n=320)

Year of students	Visual score	Aural score	Reading/writing score	Kinesthetic score
1 1 <sup>st</sup> year	247	276	225	351
2 2 <sup>nd</sup> year	205	294	227	346
3 3 <sup>rd</sup> year	213	292	228	348
4 4 <sup>th</sup> year	225	324	221	364
5 Final year	234	252	224	323

Table 2: Comparison of learning models among medical students (n=320)

Year of students	Unimodal, n (%)	Bimodal (%)	Trimodal, n (%)	Multimodal, n (%)
1 1 <sup>st</sup> year	30 (46.8)	27 (17.28)	4 (2.56)	3 (1.92)
2 2 <sup>nd</sup> year	22 (14.08)	28 (17.92)	10 (6.4)	4 (2.56)
3 3 <sup>rd</sup> year	15 (9.6)	24 (15.36)	13 (8.32)	16 (10.24)
4 4 <sup>th</sup> year	12 (7.68)	20 (12.8)	15 (9.6)	17 (10.88)
5 Final year	8 (5.12)	15 (9.6)	20 (12.8)	21 (13.44)

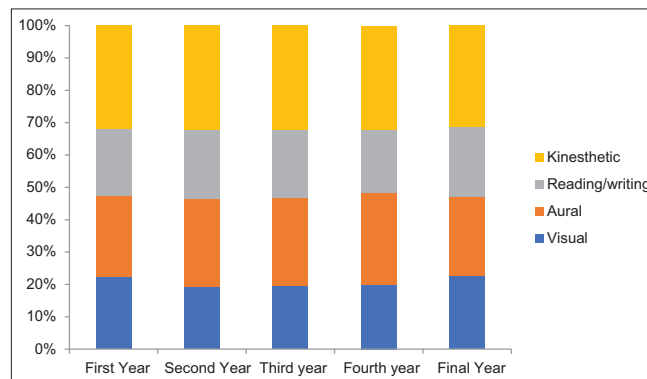


Figure 2: Learning Approaches among year wise medical students

auditory learners.<sup>[11]</sup> Previous study result showed that first academic year students preferred kinesthetic style.<sup>[12]</sup> The differences observed in our students may be due to preparatory classes for all students for 1 year before entering selected college in university where students traditionally follow didactic lectures in classes.

Multimodal is a preference style of learning but unfortunately developing countries have deficiency of skilled instructors for developing integrated curriculum. Study results have found that most of the students were bimodal learners but shifting from bimodal to multimodal styles gradually from first to final years of students. Now problem-based learning method have introduced in some private universities due to integrated curriculum implemented, it will shift the student's preference towards multimodal learning styles.<sup>[13]</sup>

The reason for this transition because there is increase demand for multimodal learning which is preferred methods of learning in clinical setting where the teaching methods changes from didactic learning to discussion and problem based learning and more focus on practical as well as reduced amount of lecture time and encouragement by instructors to develop self learning skills are probable reasons.<sup>[14]</sup> Different institutional had difference method of teaching which also influence learning behaviors. Some institutions emphasis on small discussion group compare to didactic lecture-based learning given to students.

Strategies to improve the quality of problem based learning's (PBLs) and small group discussion (SGD) such as training and workshop recommended to the instructors.

Increased in the learning approach was seen in teaching during transition in the Australian study.<sup>[14]</sup> such as trend was not observed in another study which is conducted in Indonesia.<sup>[15]</sup> Although our study showed that there is significant difference in learning approaches among medical students, this does not mean that same in non-medical fields.<sup>[16]</sup>

The need to compete for grades among students is the important factor for promoting learning among new medical students in study conducted in USA.<sup>[17]</sup> High workload with increasingly time constraint course schedules may promote assessment oriented strategic learning among students in preference to the good learning styles. Continues assignments may be other factors for promoting strategic approach to learning. The evidence<sup>[18]</sup> for any learning styles to be more successful in medical school performance is proved at best, some studies revealed that no relationship between examination success and specific learning styles<sup>[18]</sup> and

different studies found that multimodal approach better outcome of students performance.<sup>[19]</sup>

### Limitations of study

This study had limitations; First this study was cross sectional rather than longitudinal, thus it only describe the difference between the two learning styles and not identify the factors which is associated with learning performance.

### Conclusion

Learning styles differ among medical students. The learning styles suggested a positive transition toward strategic learning in medical students. It's had important implication in development of effective medical curricula in medical education.

### Acknowledgments

The authors thank the medical college team, Principal of School of Medicine in providing the technological input and support in Study. The authors thank the all Year students in taking part in the study.

### Financial support and sponsorship

Nil.

### Conflicts of interest

No potential conflict of interest relevant to this article was reported.

### References

1. Dekker S, Lee NC, Howard-Jones P, Jolles J. Neuromyths in education: Prevalence and predictors of misconceptions among teachers. *Front Psychol* 2012;3:429.
2. Abidin M, Rezaee A, Abdullah H, Singh K. Learning styles and overall academic achievement in a specific educational system. *Int J Humanit Soc Sci* 2011;1:143-52.
3. Nayak VJ, Indudhara PB, Girish HO, Yenni VV. Assessment of preferred learning modalities of undergraduate medical students using the visual-aural-read/write-kinesthetic questionnaire and the impact of gender. *J Adv Clin Res Insights* 2015;2:135-9.
4. Alkhasawneh E. Using VARK to assess changes in learning preferences of nursing students at a public University in Jordan: Implications for teaching. *Nurse Educ Today* 2013;33:1546-9.
5. Urval RP, Kamath A, Ullal S, Shenoy AK, Shenoy N, Udupa LA. Assessment of learning styles of undergraduate medical students using the VARK questionnaire and the influence of sex and academic performance. *Adv Physiol Educ* 2014;38:216-20.
6. Almigbal TH. Relationship between the learning style preferences of medical students and academic achievement. *Saudi Med J* 2015;36:349-55.
7. Nuzhat A, Salem R, Quadri M, Al-Hamdan N. Learning style preferences of medical students: A single-institute experience from Saudi Arabia. *Int J Med Educ* 2011;2:70-3.
8. Dobson JL, Linderholm T. Self-testing promotes superior retention of anatomy and physiology information. *Adv Health Sci Educ Theory Pract* 2015;20:149-61.
9. Lujan HL, DiCarlo SE. First-year medical students prefer multiple learning styles. *Adv Physiol Educ* 2006;30:13-6.

10. Balasubramaniam G, Indhu K. A study of learning style preferences among first year undergraduate medical students using VARK model. *Educ Med* 2016;8:15-21.
11. D'Amore A, James S, Mitchell EK. Learning styles of first-year undergraduate nursing and midwifery students: A cross-sectional survey utilising the Kolb learning style inventory. *Nurse Educ Today* 2012;32:506-15.
12. Davidson A, Ritchie KL. The early bird catches the worm! The impact of chronotype and learning style on academic success in university students. *Teach Learn Innov* 2016;18:1-11.
13. Bhutkar MV, Bhutkar PM. Effect of awareness of learning styles and modifications in study modalities on academic performance in first MBBS students. *Natl J Basic Med Sci* 2016;7:32-5.
14. Bulent A, Hakan K, Aydin B. An analysis of undergraduates' study skills. *Procedia Soc Behav Sci* 2015;197:1355-62.
15. Wickramasinghe DP, Samarasekera DN. Factors influencing the approaches to studying of preclinical and clinical students and postgraduate trainees. *BMC Med Educ* 2011;11:22.
16. Bjork RA, Bjork EL. Making things hard on yourself, but in a good way: Creating desirable difficulties to enhance learning. In: Gernsbacher MA, Pomerantz JR, editors. *Psychology and the Real World: Essays Illustrating Fundamental Contributions to Society*. 2<sup>nd</sup> ed. New York: Worth Publishers; 2014. p. 59-69.
17. Ibrahim N, Utaberta N. Learning in architecture design studio. *Procedia Soc Behav Sci* 2012;60:30-5.
18. Gumusburun Ayalp G, Senyigit O, Erman O. Exploring the learning styles characteristics of Turkish freshman medical students with the evidence of learning style inventory. *J Inst Sci Technol Balikesir Univ* 2015;17:68-82.
19. Trindade H. *Knowledge and Power: The Dilemmas of the Brazilian University*; 2013. Available from: <http://www.scielo.br/pdf/ea/v14n40/v14n40a13.pdf>. [Last accessed on 2019 Jan 5].