

Assessment of Ideal Learning Style among Medical Students using VARK Learning Approach

Rafia Minhas, Noor Shahid, Zain Gulzar, Sana Zafar, Shahmain Shahzad

ABSTRACT

Objective: Learning styles are important in the learning process so that students can learn in shorter time according to their preferred style. The objective of this study is to observe ideal preferred learning style among medical students and the association of the academic year with the preferred learning style.

Study Design and Setting: A cross-sectional study was conducted at Central Park Medical College, Lahore, Pakistan from September 2021 to December 2021.

Methodology: VARK learning approach was used to identify the ideal learning style. The data was collected using systematic sampling from 148 medical students. The frequency distribution of various preferences of the students was given. Distribution of gender and academic year across their ideal learning style was observed. The association of categorical factors with preferred style was tested using Chi-square test with a level of significance of 5%. SPSS version 26 was used for data analysis.

Results: About 64.8% of the students who participated in the study were female. Nearly 44.6% of the students liked the single modal learning style. Approximately 58% of students prefer K-learning style. Reading was seen as least popular single modal. About 7.4% of the students liked quad/ multi-modal learning styles.

Conclusion: The most preferred learning style among students was the single learning style. Among single learning styles most of the students preferred kinesthetic followed by aural. The least preferred learning style was found to be quad-modal. Gender and academic year were significant associated factors for preferred learning style.

Keywords: Learning styles, VARK, effective teaching, students

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INTRODUCTION:

Academic achievements and distinctions are the main parameters to access the academic performance of the student.

These parameters are influenced by the learning styles. The association between academic performance in education and learning style is still inconclusive. Learning style is the main consideration in designing a teaching methodology. Learning styles and methods used in the learning process. Learning style is the way how a student concentrates, and gain knowledge and experience. When it comes to knowledge gain, memorizing, or recall, students have unique preferences.¹

Education is a deep process of gaining knowledge, values, habits, and skills whereas learning style is described as the way which is preferred to the students for the acquisition of knowledge, process to memorize or recall.^{1,2} The combination of physiological, cognitive, and emotional traits reflects how learner perceive and respond to the environment of learning.³ It can be summarized based on given definitions that learning style is the preferred way of acquiring knowledge, skills, and experience regarding a subject which must be reliable for understanding, memorizing, and recalling in the future.⁴ Organization of the learning process and environment considering learning styles can be effective. In general, learning styles are important in the learning process. Students will be able to learn more in a shorter time if learning process is according to their preferred

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learning style. Also, identification of preferred learning styles is important to design an effective curriculum.² However, it can be a complex approach to memorizing the concept efficiently and effectively.

A student may have single or multiple learning styles.⁵ Each student has their preferred learning style according to which he or she interacts with the learning environment. The basic characteristics of graduate or under-graduate students vary in terms of culture, age, mentality level, smartness, intelligence quotient, and psychological well-being which lead to the variation in preferred learning styles.¹

Students' ways of thinking and learning styles are the significant aspects to observe the learning outcomes⁶. Most teachers prefer a learning style easy for them ignoring these two aspects.^{6,7} The teacher should determine the appropriate approach to be applied in the student-teacher learning process by considering students' way of thinking and learning style.⁷ The most familiar learning style of the student should be adopted by the teacher to get maximum learning outcomes. The teacher should identify the preferred learning style of the students. Teachers and students both must update themselves to find the appropriate learning style by mutual consensus.⁸

Over the last decade, students have been shifted from teacher-centered learning to student-centered learning.³ Students' attention and motivation improve when the facilitator molds the lecture according to their ideal learning style.⁸ Various studies have approached to observe the ideal learning style to students. Several methodologies have been adopted. Some tools to observe the preferred learning style were Fleming's VARK Learning Style, Jackson's Learning Styles Profiler (LSP), and Kolb's Learning Style Inventory (LSI). One of the widest approaches is VARK questionnaire. The estimated validation and reliability of the VARK questionnaire were adequate.

VARK questionnaire designed by Fleming and Baume categorizes four taken learning modes into the model i.e. Visual (V), Aural (A), Reading (R), and Kinesthetic (K).⁹ Each individual has their own preferred learning style with the individual capability to absorb the lesson. Some are slow learners, some are fast learners, hence they must have a different way to grab lessons and get some information. Visual learners prefer to learn through videos, images, and figures, aural learners prefer to learn through listening to lectures, reading learners likes to read text or notes whereas kinesthetic learners learn through touch and manipulation of objects.¹⁰ The objective of this study was to observe the ideal learning style among medical students and whether there exists an association between the preferred learning style and socio-economic characteristics. As the medical science is a sensitive field and medical curriculum is lengthy, the study aimed to observe the preferred learning style so that in future, learning methodologies can be designed accordingly. These results are also able to generalized to the

targeted population of medical students due to the enough and evenly distributed sample size.

METHODOLOGY:

A cross sectional study was conducted at Central Park Medical College from September 2021 to December 2021. The data was collected from 148 medical students in September 2021. The minimum sample size was calculated as 94 with 10% power of the test, 5% level of significance, and 41.6% as the preference of single model learning style.¹¹ The sample size was quite small but relatively a good representation (nearly one-fourth) of the population of medical students at Central Park Medical College. The study was conducted under the principles of the ethical review committee and approval was obtained from the Institutional Review Board of Central Park Medical College (CPMC/IRB-No/1311). The initial introduction of the learning style and objective of the study was explained to the students and information was collected after their consent the participation. Verbal consent was taken after explanation and written consent was made a part of the given questionnaire.

The inclusion criteria of the investigation were medical students enrolled at Central Park Medical College in MBBS program. Those students with enrollment before 2016 were excluded from the study. Also, those students who refused to participate were excluded from the study. Data was collected using systematic random sampling. A list of all the students enrolled in MBBS was generated and random numbers were assigned. The selected numbers were marked on the list using a systematic random sampling technique. A random start was taken and after every third number, the next student was selected. Selected participants were located on the campus and the objective of the study was explained. Those students who refused to give consent were excluded from the sample.

Data was collected using VARK version 8.01 based on 16-items. VARK tool was used to access the preferred learning style among medical students. VARK was considered as a standard tool for the assessment of the preferred learning styles of the student. The validity and reliability of VARK have been assessed and confirmed in the literature.¹² We used the VARK in the only language. In the literature, it has been transformed in another language such as in the Persian version, and has been psychometrically assessed.¹³

Another section was added to observe the age, gender, academic year, and clinical or pre-clinical year. The reliability of the added section was tested using Cronbach alpha. The reliability was found to be approximately 73%. Frequency distribution of various preferences of the students was given. Distribution of gender and academic year across their ideal learning style was also observed. Association of categorical factors with preferred style was tested using the Chi-square test with a level of significance at 5%. SPSS version 26.0 was used for the data analysis purpose.

RESULTS:

The data was collected from 148 MBBS students in all five years. The mean age of the students was 21.41 + 1.65 SD (in years). The proportion of female students in the sample was comparatively high. About 64.8% of the students who participated in the study were female whereas the rest nearly 35% were male students.

Nearly 44.6% of the students liked a single modal learning style. Among the single modals, students favored kinesthetic (K) followed by aural (A). Approximately 58% of the students prefer the K-learning style. Reading was seen as the least popular single modal. Among the bimodal learning style, approximately 62% of students prefer aural with kinesthetic. About 17.6% of the students choose a tri-modal learning style. About 7.4% of the students liked the multi-modal learning style.

Female students mostly preferred a single modal learning style followed by a bi-modal (Table 2). Approximately 52% of the male students found single modal as their preferred learning style. About 44.83% of the students in the first-year class, 57.14% of the students in the second year, 44=2.4% of the students in the third-year class, 41.38% of the students in the fourth year, and 37.9% of the students in the final year preferred single-modal style. However, during the academic year wise, most of the students preferred the single-modal learning style preferred by bi-modal.

Chi-square test of association was applied to test the

association of gender and academic year with preferred learning style. A 5% level of significance was taken. Gender was observed as a significant factor for preferred learning style with p-values = 0.036. There is statistical significance found between academic year and preferred learning style. The test of means explained that the mean age of participants who prefer various learning styles was approximately the same (p-value >0.05).

DISCUSSION:

A large number of studies have been conducted to identify the most ideal learning style near students.³ The majority of those were conducted during the traditional classroom learning environment phase where interaction between teacher and student was the key aspect to achieve.¹ In recent years, due to the advancement in technology or it would be more appropriate to say that with the support in advance technology in the COVID phase where socialization was limited in an educational institute, the trend of student-teacher learning environment has been shifted.

Both innovation and invention were in relation to technology. As the technology advances, the education system moves towards the adoption of new teaching methodologies. These methodologies were based on using multi-media, audio-visual aid and animated videos during the lecture. These teaching methodologies must be designed considering student's preferences. Hence, there is a paradigm shift in the learning choices of students. The major challenge can be the availability of facilities to use the advance technology.

Nowadays a student's learning style is based on not only his understanding but also it considers various factors of which online or on-campus education is the most significant. The dominance of some specific learning styles among students can be influenced by their study domain, teaching methodology, learning experience, the volume of course content, and curriculum content.¹⁰ Therefore, it is highly recommended to the facilitator pay more attention to the variations in learning styles and preferred learning styles among students.¹⁰

To identify preferred learning styles, the VARK questionnaire is the main approach to improve the teaching quality and learning process.¹¹ Every student has its own ideal learning

Table 1: Preference of VARK learning styles among medical students

Single Modal (n=66)	Bimodal (n=45)	Tri-modal (n=26)	Multi-modal (n=11)
V (n=9)	VA (n=2)	VAR (n=2)	VARK (n=11)
A (n=18)	VR (n=1)	VAK (n=12)	
R (n=5)	VK (n=9)	ARK (n=7)	
K (n=34)	AR (n=2)	VRK (n=5)	
	AK (n=26)		
	RK (n=5)		
n= 66	n=(45)	(n=26)	(n=11)

Table 2: Crosstab of gender and academic year with preferred VARK model

Factor	Categories	VARK Modal				Total
		Uni-modal	Bi-modal	Tri-modal	Multi-modal	
Gender	Male	27	13	05	07	52
	Female	39	32	21	04	96
Academic Year	1 st Year	13	10	05	01	29
	2 nd Year	16	07	02	03	28
	3 rd Year	14	12	05	02	33
	4 th Year	12	06	09	02	29
	5 th Year	11	10	05	03	29

preference. With the advancement in technology, students may or may not be attracted to use books.¹ So to enhance the teaching quality and improve the learning process, student's perception for learning methodology must be considered. Learning style and self-awareness lead each student to choose individually their appropriate learning technique. The idea of developing VARK philosophy is that everyone can learn if his/ her distinction is verified. Identifying student's interests will facilitate the teacher to move to the student's learning style from his/ her own teaching methodology and in overcoming the situation where all students tend to prefer specific learning styles.¹⁴ It also helps in the improvement of teaching structure by considering student's point of view.¹⁴

In our study approximately 45% of the students preferred single modal learning style. Similar to our findings, another study conducted in Iran found that 41.8% of the participants preferred one learning style.¹¹ Another study conducted by Baykan and Nacar using VARK questionnaire identified the preferred learning styles among one-year medical student and found that 36.1% preferred uni-modal learning style.¹⁵ A study reported the preferred learning styles of two groups of students' i.e. strong students and weak peers. They observe that 47.2% of weak students and 42% of strong students preferred a single learning style.¹⁰ The conclusion was similar to other studies found in literature where the participants preferred a single modal learning style.³ A study conducted in Pakistan reported that more than 60% of the students preferred multi-modal whereas the remaining 39.37% preferred one of the single modal learning style.¹

The most preferred single modal learning style was observed as Kinesthetic (K) followed by Aural (A). A recent study done in Pakistan revealed the same conclusion where preferred learning style was Kinesthetic (K) followed by Aural (A).¹⁶ Similar results were found in another study where the preferred learning style was Kinesthetic (K) followed by Visual (V) and Aural (A).¹ In contrast to our results, some studies mentioned that among single modal learning styles, the most preferred style was Aural (A) followed by kinesthetic (K).¹⁷ A similar conclusion was found in other studies conducted in Iran.⁴ Visual and Kinesthetic (VK) was found as the most common bi-modal learning style.³ We observed that Aural and Kinesthetic (AK) was the ideal learning style among bi-modal followed by Visual and Kinesthetic (VK). Among tri-modal learning styles, VAK was seen as the most preferred learning style. Similar findings were found in other studies conducted in Pakistan.³

Various studies exist in literature where students preferred multi-modal learning style.^{18,19} In our findings, the least preferred learning style was multi-modal or quad-modal. Various studies reported that multi-modal learning style has become the most dominant learning preference.^{20,21} In the present research, we observed that gender and preferred

learning styles were significantly associated. Quite opposed to our findings another study reported that insignificant difference was found between gender and mean scores obtained from learning styles.²¹

The underlying study was single-centered i.e. conducted in one medical college. No approach was used in the underlying study to observe the ideal learning style rather than the preferred learning style. For that various other associated factors can be tested with preferred learning style such as academic performance of the student and its preferred learning style and the educational outcomes using teaching methodology according to the preferred learning style.

Active learning techniques must be adopted in classroom as they consider various characteristics of learners and are more appropriate and reasonable. Discussion, collaboration, playing roles, stimulating models and active strategies can be utilized. Every student has its own ideal learning preference. This is also important to enhance the teaching quality and improve the learning process, student's perception for learning methodology must be considered. Students will be able to learn more in a shorter time if learning process is according to their preferred learning style. The current study is limited to generalize on the medical colleges in public sector there may be difference in student's ideal learning style due to the available facilities.

CONCLUSION:

The most popular learning style among students was single modal followed by bimodal. Among the bimodal learning style aural together with kinesthetic (AK) was the most popular learning aspect. Multi-modal was the least preferred learning style among students. VARK learning style modal is an effective tool for accessing students' preferred learning styles. As we observed that a single modal learning style is preferred among medical students, there is a need for policymakers to explore the teaching strategies and evaluate the effectiveness to ensure that learners are effectively seeking knowledge. The academic system needs to adopt the teaching methodology according to the student's preferred learning styles.

Authors Contribution:

Raffia Minhas: Study Design, data collection and supervision of study

Noor Shahid: Write-up, data entry and Analysis, Interpretation

Zain Gulzar: Drafting and Proof Reading

Sana Zafar: Data collection, Data Entry

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