Original article:

Assessment of learning style of preclinical medical students using VARK: an endeavor to increase efficacy of teaching learning strategies

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Abstract

Introduction: First year medical students are exposed to increased volume and contents in the medical education all of sudden. Medical council of India decreased duration of the first year in Medical curriculum from 18 months to 12 months. In this time students have to adjust to new environment and new curriculum and new examination pattern. Every individual has a different learning preference and style. If the learning style of medical students is assessed, the teachers and students might be in a better position to decide the teaching learning methods adopted. If an appropriate teaching learning method is adopted, teachingmight become more effective. To assess the learning style the VARK learning style inventory is used. It's an online and paper based 16 question inventory to analyze the learning style. So we conducted this study to assess the learning style of the first year medical students from our institute.

Methods and materials: The study was conducted in the Government Medical College , Latur after obtaining an ethical clearance. An informed consent was obtained from the participants and printed version of the VARK 16 question questionnairewas circulated.Out of 148 students 138 consented to participate in the study .The fully answered questionnaire were collected from them and data was analyzed using Microsoft excel.

Results: Total 138 students participated in our study, 61 percent of them preferred multiple mode of learning and 39 percent preferred any single mode from Visual, auditory, read and write and kinesthetic mode. Out of the multimodal learners 43 percent were quadrimodal learners, 36 percent were trimodal and 21 percent were bimodal learner. Kinesthetic learners were more than the visual and auditory learners among the unimodal learners.

Conclusion: Majority of the students preferred multimodal learning with a dominance of kinesthetic learning. The finding of our study suggest that teachers should design the lesson according to the leaning predominance of their students so that the teaching-learning methods will become more effective and efficient. There is need for a large scale study to understand the learning style of the medical students across the country so that the guideline can be framed for a better teaching learning environment.

Key word : VARK, First year medical students, learning style.

Introduction

The medical students admitted in the first year of MBBS face drastic change in volume and content of the study material. There is a change in the pedagogical style of the teachers also. To add in, first MBBS course in India is decreased from three terms of six months each to only two terms and effectively the first MBBS students are getting only nine months to deliver the results! It becomes necessary for teachers to understand the learning styles of diverse group of students in order to assist learning. The paradox of the medical educations is teacher themselves are not

formally trained to teach in medical education and hence lack the necessary knowledge and skills. Therefore as facilitators, it becomes our responsibility to understand this and reach out to students with well co-ordinated teaching and learning styles.[1]

Learning style is defined as "composite of characteristic cognitive, affective and physiological characters that serve as relatively stable indicators of how a learner perceives interacts with and responds to the learning environment'A learning style or preference is the complex manner in which, and conditions under which, learners most efficiently and most effectively perceive, process, store, and recall what they are attempting to learn [2]. One characterization of learning styles is to define the learner's preferred mode of learning in terms of the sensory modality by which they prefer to take in new information. Students use different sensory modalities to absorb knowledge and information. Four sensory modalities described by Fleming are; Visual (V), Aural (A), Reading/Writing(R) and Kinesthetic(K), which is called as VARK.Thus VARK is a perceptual, instructional preference model that categorizes learning[3].

Although learners can use all of these sensory modes of learning, one mode is often dominant and preferred. For example, visual learners learn through seeing drawings, pictures, and other image-rich teaching tools. Auditory learners prefer tolearn by listening lectures, peer group discussions, and talking through ideas. Reading/writing learners learn through interaction with textual materials, whereas kinesthetic learners learn by touching and experiences that emphasize doing, performing a task and getting physically involved. [3].

We were interested in knowing the learning style preferences of our first-year medical students so that we could develop suitable learning methodologies in our instruction. To achieve this objective, we planned a descriptive study, a study that endeavored to reveal patterns associated with a specific group without an emphasis on prespecified hypotheses or otherwise called as hypothesis-generating studies. The rationale for this descriptive study was to help us to bring about the changes in the pedagogy that addressed all students and to identify areas for further research. We used the VARK Inventory Tool for assessing individual preferences for learning with sensory domains. This is easy to administer and reliable indicator of learning style preferences of the learners in various environment and age.

Material and Methods

A cross sectional study was conducted at Government Medical College, Latur in January 2016. The study was approved by the institutional ethics committee. An informed consent prior to the administration of the questionnaire was obtained. The questionnaire was based on the VARK learning preferences version 7.2. The questionnaire consisted of 16 questions with multiple options. The participants were asked to tick according to their choice(s) of answer.

Participants

First year medicalstudents tookpart in the study. The institute has intake capacity of 150 admissions per year, admissions are done in the month of August every year. VARK Questionnaire was distributed among 148 MBBS students in the class and were instructed about the use of this research followed by the specific instruction about the VARK Questionnaire.They can give one or multiple answers to a question or leave a question unanswered if they

think that is not applicable to them.Total 138 students returned back the fully answered questionnaire, there were 62 male and 76 female students .

. Questionnaires were collected back and analyzed according to the key and data was tabulated to determine the learning style of the participants.

Instruments

A VARK questionnaire that was used to assess the preferred study mode of the students was downloaded from website of the developers[5]The questionnairemeasures four perceptual preferences (V-visual, A-Auditory, R-Read/Write, K-Kinesthetic). It consists of 16 questions with four options each. The purpose of each question was to categorize the learning style preference of the participant.

Statistical Analysis

Data entry and analysis were performed with Microsoft Excel. The number of students who preferred each mode of learning was divided by the total number of responses to determine the percentage of students in each category.

Results

As in Figure 1. the percentages of students who preferred visual (7.5%), auditory (3.9%), reading/writing (8.6%), kinesthetic (19%), and multiple modes (61 %) of information presentation. Only 39 % of the students preferred a single mode of information presentation (either visual, auditory, reading/ writing, or kinesthetic).

Of the 138 students 84 (61% of all students) who preferred multiple modes of information presentation, some students preferred two modes (bimodal, 21%), some students preferred three modes (trimodal, 36%), and some students preferred four modes (quadmodal, 43%). Figure 2 presents the percentages of students who preferred two, three, or fourmodes of information presentation. Most students preferred three or four modes (76%) of information presentation.

Chart 1- Pie chart showing percentage of students with their Learning preferences

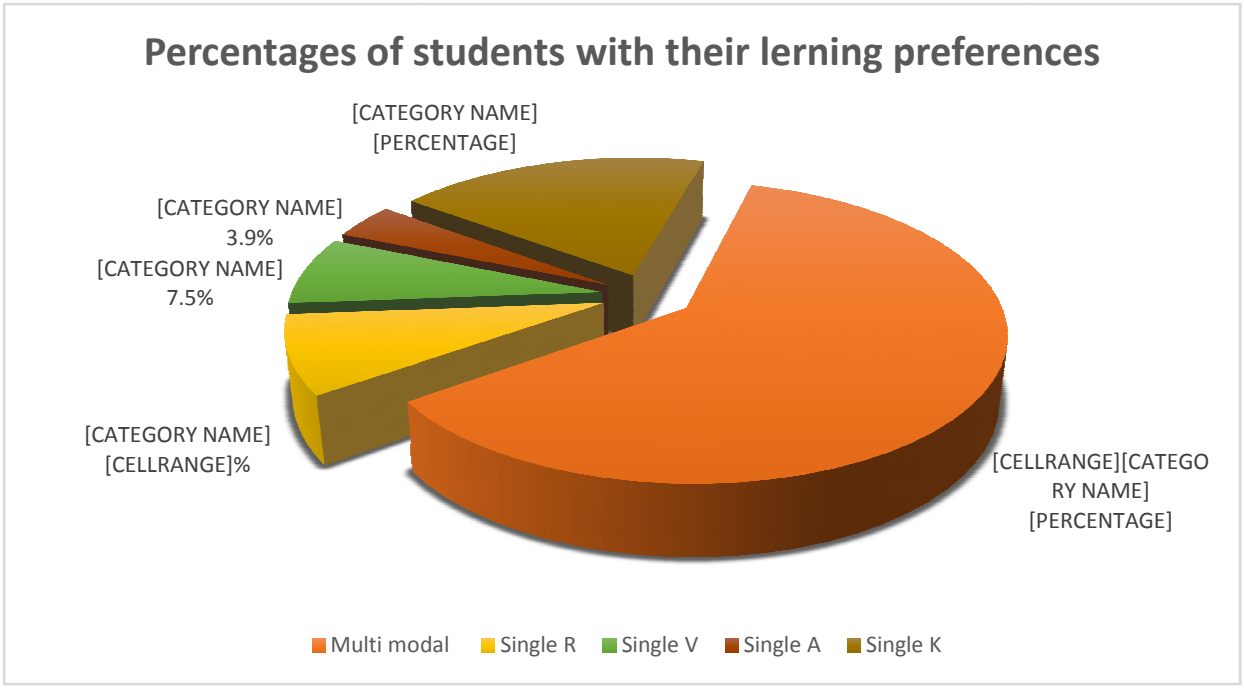

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Chart.2- Pie chart showing percentage of students having bimodal , trimodal and quadrimodal learning preferences in among multimoda

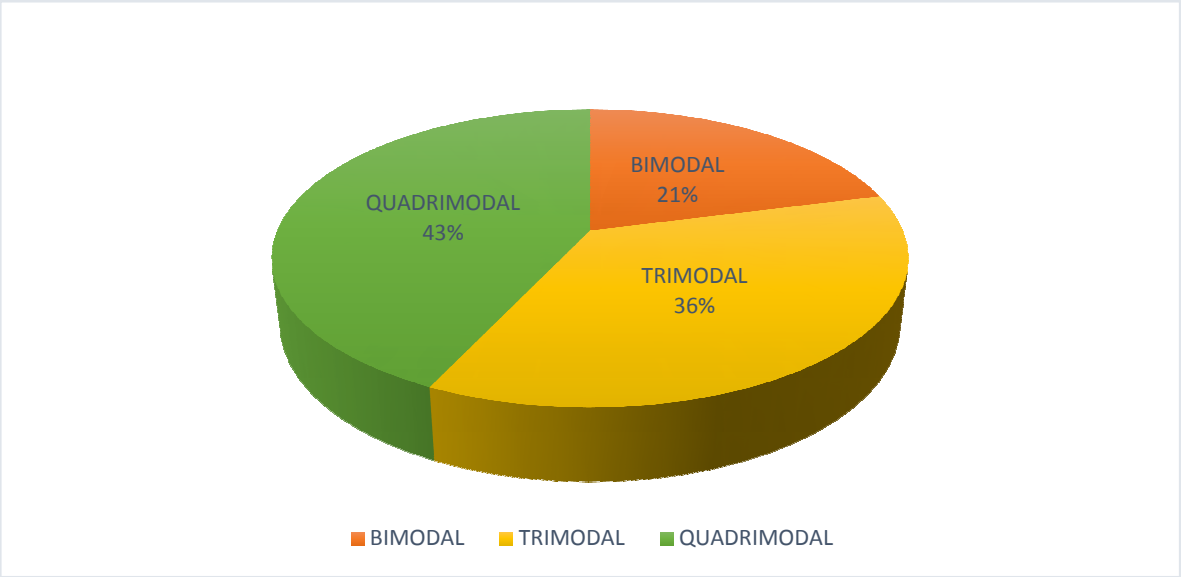
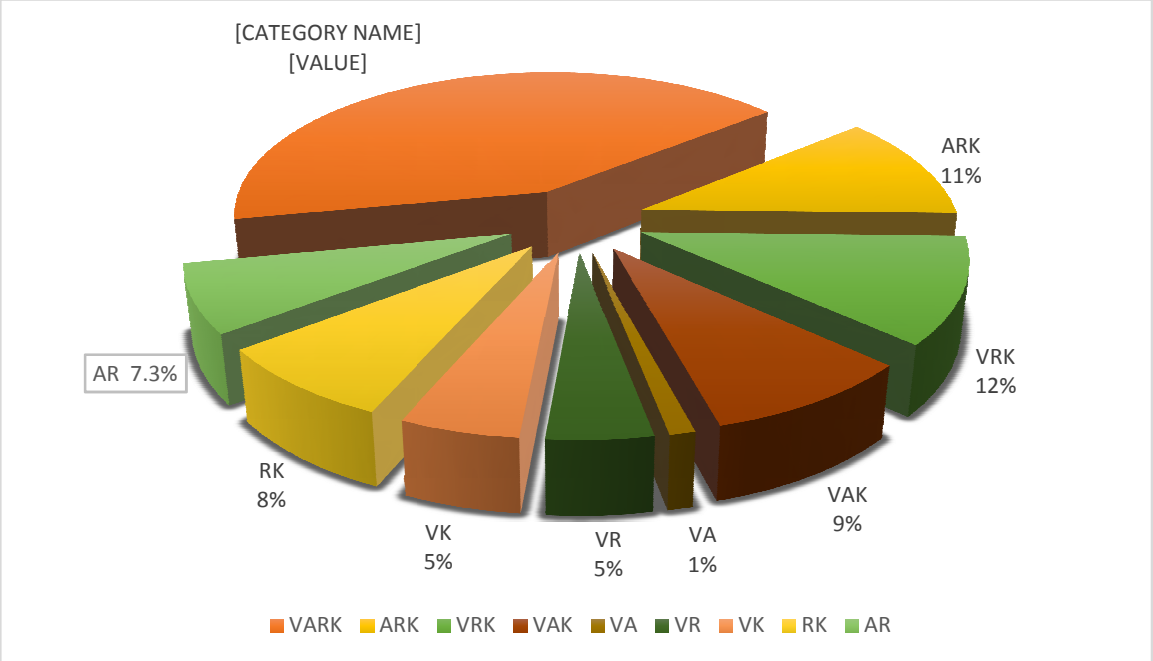


Chart-3- pie chart showing percentage of students in various combinations of preferences in Bimodal, trimodal and quadrimodal learning style preferences



Of the students who preferred three modes of information presentation, some students preferred auditory , reading/writing, and kinesthetic (11%), some students preferred visual, reading/writing , and kinesthetic (12%), and some students preferred visual,auditory, and kinesthetic (12.3 %) as shownin figure 3.. Of the students who

preferred two modes of information presentation, some students preferred visual and auditory (1%), some students preferred visual and reading/writing (5%), some students preferred visual and kinesthetic (5 %), some students preferred kinesthetic and reading/writing (8%), and some students preferred visual and reading/writing (7.3%) (Fig. 3). Obviously, of the students who preferred four modes of information presentation, all students preferred visual, auditory, reading/writing, and kinesthetic (43.4%).

Discussion

The educational world is acknowledging the importance of understanding the students' different learning style preferences and their role in attaining academic success. [6,7] Knowledge of the learning styles has implications for both the medical teachers and the students. If students identify their learning preferences, it can help them in using the appropriate learning strategies. As a result, they are more likely to become lifelong self directed learners and to maximize their true potential. If the teachers become aware of the student's learning styles they can incorporate teaching-learning strategies which are tailored to meet the student's learning preferences. This would not only create an efficient learning environment, but also motivate the students to achieve academic success.

Thus the present study administered the VARK questionnaire to the first M.B.B.S. students to determine their learning style preferences. A majority of the students (61%) preferred multi modal learning style which indicated that they preferred multiple modes of learning. The results of previous studies which were conducted among first year medical students from various other countries reported similar results. Their most preferred learning style was also multimodal[8].Study conducted by Nuzhat A, in Saudi Arabian students showed similar results.[9] Lujan and Dicarlo reported that 36.1% of first year medical students preferred single modal styles and that 63.8% preferred multi modal learning styles.[10]Peyman H. etal studied learning preferences of Iranian students and found similar results. In their study 58.2% students preferred multimodal learning[11]. Multi modal learners prefer to receive information by using different methods. This group of learners will not learn by using only a single method like attending lectures [12].

These students had a balanced set of preferences, which means that they prefer information to arrive in a variety of modes. These students may adjust to the different teaching styles faced in a day or they may opt in and out of alternative strategies, such as being visual/ auditory in cardiovascular physiology and reading/writing in renal physiology for example. Knowing the students preferred modes can provide a focus for developing strategies that are individualized [13]. According to the *meshing hypothesis*, instruction is best provided in a format that matches the preferences of the learner (e.g., for a "visual learner," emphasizing visual presentation of information)[13]. Neuroscience research has also revealed that significant increases in learning can be accomplished when the learning environments cater to their predominant learning styles[14].

Of the 39% students who had unimodal learning styles, 19% preferred the kinaesthetic mode, 7.5% preferred the visual mode, 3.9% preferred the auditory mode and only 8.6 % preferred the read-write mode. Therefore, the kinaesthetic mode was the most preferred mode and the read–write the least preferred mode of the information presentation, similar results were obtained by Peyman H. and his team. In the unimodal learning style category, they found that the most preferred mode was the kinaesthetic, followed by the visual, auditory and the read-write. They further suggested that the active learning strategies such as role playing, simulations, use of models, debates, etc

which are preferred by the kinesthetic learners would be more beneficial to the students than the traditional lecture formats. Active learning strategies not only encourage the critical thinking (evaluation, analysis, and interpretation of the information [11,14].

Since the results from our study shown that the majority are multimodal learners, there is a need to inform the medical educators, as one model of teaching will create a monotonous learning atmosphere and everyone will not enjoy the process of learning[15]. Furthermore, student-centric classes should be encouraged to replace traditional teacher-centric classes for the benefit of the majority of students. All sensory modalities teaching can also allow all types of students to contribute the learning session actively and meaningfully [16].

Strength and limitations –

Our study was conducted with a validated questionnaire and a valid tool used worldwide to assess the learning preferences/style profile of the learners is major strength of our study. Present study was conducted in a single institute and only in the first year medical students. A large scale study involving medical colleges in various states throughout the country in which all the students from first year to final year are enrolled might be able to give a large scale picture of the learning preferences of the medical students in India. Being a small study from a single institute is alimitation of our study.

Conclusion

Students learn by various ways and their learning style and preferences are different from one another. In our study majority were multimodal learners and they learned by multiple ways. Among the unimodal learners kinesthetic learners were more than the visual, auditory or read and write type of learners. Our study highlights that there should be a revival in the teaching methodologies adopted by the institute and it should be tailored for the learning references of the students, we further advocate that assessment of the learning style should be done in the beginning of the curriculum every year and the teaching methodologies can be modifies according to the results of the survey. This approach will encourage the learners and make an ideal learning environment. We further suggest that if the learning style is correlated with results of the students in their exam, it might provide an evidence to justify or reject this hypothesis.

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