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## Original Research Article

## Study on learning styles of first year medical students attending CBME curriculum at a medical college of Bihar

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## ABSTRACT

**Background:** Students vary in their preference of learning styles. CBME has provided opportunity to introduce new learning techniques. Students are also exposed to basics of adult education. Assessment of learning styles using VARK has been widely adopted.

**Aims:** The present study was conducted to recognize the learning styles of first year medical students attending anatomy classes as per CBME curriculum in a medical college of Bihar.

**Materials and Methods:** The present study was cross-sectional in nature conducted upon 118 first year medical students attending anatomy classes as per CBME curriculum. Self administered VARK questionnaire was given to the students. Data was analyzed and inferences were drawn.

**Results:** Mean age of the students was 17.9 years. Multimodal style of learning was universally preferred. 89% preferred quadrimodal, 9% trimodal and 2% bimodal styles. Visual style was preferred by 89%, Auditory as well as Read/ write style each by 95.8% and Kinesthetic style by 93.2%.

**Conclusion:** Students must be aware of their preferences of learning styles. Teachers must also be oriented towards the same to provide choices of learning methods to the students to increase learning outcomes.

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### 1. Introduction

The composite characteristics of cognitive, physiological and affective attributes are known as learning style. It provides insight into how a learner acknowledges any information. It includes acquisition and processing of information by a person.<sup>1</sup>

Learning styles differ in different students and depends upon their intellectual capabilities and individual choices.<sup>2</sup> Anatomy has been included as pre-clinical subject and is being taught to the medical students in the first year of their course. Medical Council of India introduced “Competency Based Medical Education” (CBME) from the year 2019 onwards which focuses on development of competency rather than acquiring knowledge. Major part of anatomy is

taught in the first year along with its clinical application while anatomy is continued to be taught in further years of medical course as vertical and horizontal integration.<sup>3</sup>

Fleming introduced VARK Inventory Tool in 1998 to provide learners an insight about their learning styles. This tool utilises the sensory modalities which are involved in acquiring and processing the information. VARK stands for Visual (V), Auditory (A), Read/Write (R) and the Kinesthetic (K) sensory modalities. The visual learners prefer information in terms of charts, graphs, flow charts etc. which are in the form of graphics. The auditory learners prefer information in the form of learn best from lectures, group discussion, radio which can be heard. The read-write learners prefer information displayed as words and is the most preferred method among teachers and students. The kinesthetic learners like to gather information by demonstrations, simulations, videos and movies of “real”

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things.<sup>4</sup>

It has been seen that the learning style varies between students as well as from place to place. If the teachers and students can identify the preferred learning style, the teaching can be student centric. Multiple modalities of teaching can be provided which suites learners with varying preferences. Thus, it is expected to enhance the performance of students if the learning style suites their needs.

With the introduction of modern technology in medical education and introduction of competency, it is expected that the learning preferences should also evolve with time. Hence, the present study was conducted to assess the pattern.

## 2. Aims & Objectives

The present study was conducted to recognize the learning styles of first year medical students attending anatomy classes as per CBME curriculum in a medical college of Bihar.

## 3. Materials and Methods

### 3.1. Study setting

The present study was conducted at a medical college of Bihar. Competency based medical education curriculum has been implemented in the institute from 2019 batch onwards. It focuses on development of competency by providing multiple types of learning opportunities.

### 3.2. Duration and type of study

The present cross-sectional study was conducted between October 2019 to January 2020. Data collection was done between October 2019 to November 2019.

### 3.3. Study subjects

First year medical students of 2019 batch were included.

### 3.4. Inclusion criteria

First year medical students studying in the institute were included in the present study.

### 3.5. Exclusion criteria

Students not giving consent were excluded. All the students agreed to participate.

### 3.6. Sampling

No sampling was done. All the students fulfilling selection criteria were included.

### 3.7. Data collection procedure

Self administered semi-structured questionnaire was given to the students. Before data collection process, students were informed about the study and consent was taken. Then, data was collected by administering the questionnaire. VARK questionnaire was given to the study participants which consisted of 16 questions with four options each. Students can choose more than one option to identify their learning style. The questionnaire measures four sensory modalities (Visual (V), Auditory (A), Read and write (R) and Kinesthetic (K)). Faculty and staff of the department helped in data collection.

### 3.8. Data analysis

Data was entered in Microsoft Excel and analyzed using SPSS v 20. Percentage, proportions and contingency tables were used for description of the data. P- value <0.05 was considered as statistically significant.

### 3.9. Ethical consideration

Waiver from Institutional Ethics Committee was sought. Consent was taken from the participants. Confidentiality of records was maintained.

## 4. Results

The present study included 118 students of which 76 were males and 42 were females. Mean age of the students was 17.9 years.

Table 1 shows the preferred learning style of students. Analysis of VARK indicated that all the students preferred multimodal style of learning. 89% preferred quadrimodal, 9% trimodal and 2% bimodal. Preference of unimodal learning style was not seen in any case. It was found that Visual style was preferred by 89%, Auditory as well as Read/ write style each by 95.8% and Kinesthetic style by 93.2%. The difference between males and females regarding VARK score was not significant statistically ( $p > 0.05$ ).

## 5. Discussion

Medical education in India has traditionally focused on covering the syllabus using lectures, tutorials, practical classes and ward teaching. The outcome has been assessed in a summative way, summarizing the learning achieved through the above methods. There has not been any attempt to provide alternative methods of teaching or learning methods based on learners' preferences. Hence, the medical students were usually unaware of their learning styles and had problems in acquiring and retaining of information. Formative assessment has also been minimal, limited to end-semester examinations.<sup>5</sup>

Introduction of competency based medical education in India has been a major attempt to make medical education

**Table 1:** Showing the learning styles of first year medical students

Learning style	Male (n=76)	Female (n=42)	Total (n=118)
Visual	67 (88.2%)	38 (90.5%)	105 (89%)
Auditory	71 (93.4%)	39 (92.9%)	113 (95.8%)
Read/ write	74 (97.4%)	42 (100%)	113 (95.8%)
Kinesthetic	70 (92.1%)	40 (95.2%)	110 (93.2%)

p-value &gt; 0.05

relevant to the current times. This has been introduced in the year 2019 and has been considered to be a major breakthrough. Foundation course, horizontal and vertical alignment, student doctor concept and electives can be said to be important innovations. All these methods provide learners with new opportunities to acquire knowledge through a variety of learning styles.<sup>6</sup>

The present study was conducted with a focus on the learning style preferences of medical students after they have undergone foundation course and three months of new curriculum. The exposure to learning techniques and basics of adult learning during the foundation course made these students more oriented towards the preferred ways of learning and student's active participation in choosing and implementing the same.

Hence, it was observed that all the students preferred multimodal style of learning. 89% preferred quadrimodal, 9% trimodal and 2% bimodal. This is in contrast to findings of researchers who worked upon the old curriculum. Joshi et al. observed that 61% of the students preferred multimodal learning while 39% had unimodal choices.<sup>5</sup> On the other hand, Begum and Jabeen found that 80.27% of the first year medical students preferred unimodal learning.<sup>7</sup>

Regarding the sensory modalities preferred, it was observed in the present study that Visual style was preferred by 89%, Auditory as well as Read/ write style each by 95.8% and Kinesthetic style by 93.2%. Preferred sensory modalities have been assessed by researchers from India and abroad.<sup>8–17</sup> Joshi et al. found that 61% participants preferred multimodal learning styles. Bimodal learning was 32.6% for VK, 31.50% for VA, 30.3% for AR and 27.0% for RK. ARK was 13.5% and VAR 12.4% in Tri-modal learning style. Kinesthetic style was the most preferred mode among first year medical students (33%), followed by Auditory (16%), Visual (14.6%) and Read-Write (7.86%).<sup>5</sup> On the other hand, in the study conducted by Begum and Jabeen, it was seen that 47% had a preference for the Kinesthetic style followed by visual style (30%), Auditory (14%) and Read/write (9%). 19.73% preferred multiple learning styles (multi modal).<sup>7</sup> Preference for multimodal style is one of the key changes observed in the present study. It may be related to exposure to students to varieties of learning techniques as well as orientation to principals of adult learning methods.

Introduction to adult learning and providing choices of learning techniques was found to make the medical

students more reflective in nature who could better utilize their preferred learning styles. However, studies have not been done regarding how much this translates into the improvement in learning outcomes which may emerge as future area of research.

## 6. Conclusion

Traditionally, learning has been passive in medical schools where the usual methods applied are lectures and tutorials. The students are also not aware about their learning preferences. CBME provides options to introduce multiple methods of teaching learning. If the students are aware about their preferred learning methods and teachers also adopt teaching strategies accordingly, this is expected to create conducive learning environment which may reflect in terms of better knowledge gain and increase in competency of these students.

## 7. Source of Funding

None.

## 8. Conflict of Interest

The authors declare that there is no conflict of interest.

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