

## Research Article

# How different are students and their learning styles?

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### ABSTRACT

**Introduction:** Students, like anybody else differ from each other. As students they differ in their preferred mode of learning, i.e. their preferred modes in gathering, organizing and thinking about information. A recent classification proposed by Neil Fleming and associates state that students learning styles can be divided into Visual/graphic, Aural, Read/write and Kinesthetic types, VARK.

**Aim:** The aim of the recent study is to investigate learning styles among dental students in two different dental colleges of India.

**Method:** The VARK-questionnaire contains 15 multiple-choice- questions with four possibilities to select an answer. Each possibility represents one of the four modes of perception. But, one can select more than one answer to each question, which is necessary for the identification of poly modal modes of perception and learning. This is also a psychometric problem when trying to state a measure of the reliability of the questionnaire. The VARK-questionnaire was distributed among 200 students and was collected back. This sample size represents 100% response rate from the students in the class and is markedly above the level required to make conclusions about student preferences for receiving and processing information. The students spent about 10 minutes in an ordinary lesson to fill in the questionnaire. Students register number and name were used in the study and there was no blinding practiced.

**Study Design:** Questionnaire based clinical study

**Results:** The responses from the students in our University were classified into multi-modal (VARK), tri-modal (VRK, VAK, VAR, ARK), bi-modal (VR, VA, VK, RK) and uni-modal (V, A, R.K) categories. Results showed that subjects had a higher preference for multimodal learning.

**Conclusion:** We conclude that students in our set up prefer multimodal and more of Kinesthetic of learning. To meet their needs, a variation in teaching, learning and examination must be implemented. If not, these students with a high kinesthetic preference for perception and learning may be at the losing end.

**Keywords:** VARK, Dental education, Kinesthetic, Learning style

### INTRODUCTION

Learning style is defined as the “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.<sup>1</sup> Undergraduate dental education, as with any other educational program, needs ongoing improvements to meet the changing demands of dental practice in the 21<sup>st</sup> century. Although the complexities of

dental care have increased dramatically over the last century, the method of teaching medicine has hardly changed. There has recently been widespread interest in the evaluation of learning technique since its adoption.

Educational researchers postulate that each individual has a unique learning style.<sup>2</sup> As health care educators, it is our responsibility to be aware of the learning styles of our students. Knowledge of learning styles may help educators identify and solve learning problems among students, thus helping their students to become more effective learners.<sup>3-6</sup> While doing so, it may be possible to reach out to more students because of the better match between teacher and learner styles.

There are many methods available for assessing learning styles, with each method offering a distinctly different view of learning style preferences.<sup>7,8</sup>

VARK defines the preference in learning style in terms of the sensory modality in which a student prefers to take in new information. Four sensory modalities of learning have been defined: visual, auditory, read-write and kinesthetic.<sup>9</sup> *Visual learners* prefer the use of symbolic devices such as diagrams, graphs, flow charts and models that represent printed information. *Auditory learners* prefer "heard" information and, thus, learn better through discussions, lectures, tutorials and talking through material with themselves or others. *Read-write learners* prefer printed words and texts as a means of acquiring new information; they thus prefer textbooks, lecture notes, handouts, lists and glossaries. *Kinesthetic learning* employs a combination of sensory functions; such learners have to feel or live the experience to learn; they prefer simulations of real practices and experiences, lessons that emphasize on performing an activity, field trips, exhibits, samples, photographs, case studies, "real-life examples," role-plays, and applications to help them understand principles and advanced concepts. Some learners have a preference for any one of these learning modalities (unimodal learners), whereas multimodal learners do not have a strong preference for any single method. They rather learn via two or more of the modalities. Multimodal learners thus are sub-classified as bi-, tri-, and quadmodal learners, who prefer to use two, three, or four styles, respectively.

The study conducted by Erica A *et al*, concluded that there are a variety of learning styles present in the classroom and that there are gender differences in learning styles. One of the suggestions the authors made was to conduct further studies to determine whether the learning style preference correlates with performance.<sup>10</sup> This inspired us to conduct the present study to assess the preferred learning styles of dental students of our institution; to determine if differing learning styles among students has any influence on their performance in the examinations; and to detect a gender difference if any, in learning styles.

## METHODS

The study was conducted in the Department of Oral medicine and Radiology of two dental colleges, one in Mangalore, Karnataka and the other in Ahmedabad, Gujarat. Written permission through e-mail was obtained for using the VARK questionnaire from its developers. Individual consent was obtained from those who volunteered to participate in the study. Self Response VARK questionnaires were administered to students of these colleges. Participation was purely voluntary and to avoid bias and obligations, junior residents were chosen. The VARK questionnaire in which subjects had to record their responses was administered as a hard copy to be completed in the clinics. No interaction among participants was allowed while answering the questionnaire. No clarifications were offered regarding any of the questions and the subjects answered the questions to the best of their interpretations. The VARK-questionnaire contained 16 multiple-choice- questions with four possibilities to select an answer. Each possibility represents one of the four modes of perception. But, one can select more than one answer to each question, which is necessary for the identification of poly modal modes of perception and learning. This is also a psychometric problem when trying to state a measure of the reliability of the questionnaire. The VARK-questionnaire was distributed among 200 junior residents. They spent about 10 minutes to fill in the questionnaire.

## Analysis

Data were reported as percentages of students in each category of learning style preference. The number of students who preferred each mode of learning was divided by the total number of responses to determine the percentage. Data was assessed using SPSS software version 11.5.

## RESULTS

Two hundred junior residents, 98 males (49%) and 102 females (51%) returned the completed questionnaire voluntarily. The responses were tallied and assessed for learning style preference, gender difference in learning style preference and correlation between learning styles (Table 1).

Forty nine students [(23 males and 26 females)] preferred unimodal learning. Among the unimodal learners two (0.3%) students preferred visual, 17 (36.5%) preferred auditory, seven (11.1%) preferred read-write and 23 (49.2%) preferred kinesthetic mode of learning. One hundred and fifty one students [(74 males and 78 females) 70.7%] preferred multimodal learning. Among the multimodal learners 38 (25%) students preferred bimodal, 37 (24.3%) preferred trimodal and 77 (50.66%) preferred quadmodal learning.

**Table 1: VARK Score and gender preference.**

VAR K mode	Males (%)	Females (%)	Total (%)
<b>Unimodal</b>			
Visual	1 (50)	1 (50)	2 (0.3)
Auditory	7 (30.4)	9 (34.6)	17 (36.5)
Read-Write	3 (42.8)	4 (57.2)	7 (11.1)
Kinesthetic	12 (52.1)	11 (47.9)	23 (49.2)
<b>Total</b>	<b>23 (47.9)</b>	<b>26 (52.1)</b>	<b>49</b>
<b>Multimodal</b>			
Bimodal	24 (63.2)	14 (36.8)	38 (25)
Trimodal	18 (48.6)	19 (51.4)	37 (24.3)
Quadmodal	32 (42.1)	45 (57.9)	77 (50.7)
<b>Total</b>	<b>74 (48.7)</b>	<b>77 (51.3))</b>	<b>151</b>

No gender differences were observed in the learning style preferences among our students.

## DISCUSSION

Learning is never a burden if the new information to be grasped is presented in a style that is favorable to students. If learning is made pleasurable, the performance in examinations should improve. The onus is on the teacher to understand the students' learning style and adapt rather than expecting the students to adapt to his/her style of teaching.

In our study, there was a wide diversity in learning style preferences among students irrespective of the gender, with majority of the students (70.7%) preferring multimodal instruction. Nearly 36% (N=77) of the students preferred to use all four modes of learning, followed by nearly 18% students who preferred either bimodal or trimodal learning. The Kinesthetic modality was the most preferred unimodal learning style among both male (45.8%) and female (50%) students, followed by the auditory mode (41.7% males and 38.64% females). This might be due to the fact that the students have come to terms with (or at least are trying to) the teaching style adopted, which is predominantly didactic lectures. One way of testing this hypothesis is by comparing the learning styles of these students to those in other institutes where teaching is not predominantly through didactic lectures.

There was no comparison between the learning style preference done as no learning style is superior; learning in the preferred style only makes learning easier and enjoyable. This lack of correlation may also be due to the fact that students from a dental college in India represent

the *crème de la crème* of society as far as good performance in examinations is concerned. So these students are able to perform well regardless of the potential hurdles due to their mismatched learning styles. Unlike the study conducted by Erica A et al.<sup>10</sup> we did not find any gender differences in either the learning style or the performance.

The knowledge of student preferred learning styles is vital if we, as educators, are to provide tailored strategies for individual students.<sup>9</sup> Knowing students' preferred learning style also helps to overcome the predisposition of many educators to treat all students in a similar way as well as motivate teachers to move from their preferred mode(s) to using others. In so doing, they can reach more students because of the better match between teacher and learner styles.<sup>6,8,12-15</sup> There is definitely a trend in teaching, to instruct all students in the same way in a lecture format because of the relative ease of information passing, the need to cover the content, a long history of traditional lecturing, and perhaps due to their own preferences in learning which may not always be right. The results of the present study should convince teachers to use multiple modes of information presentation. This may require instructors to stray from their own preferred mode(s) of teaching and learn to using a variety of styles, which will positively affect learning. By using a variety of teaching approaches, teachers will reach more students because of the better match between teacher and learner styles. In some cases, it may be difficult to tailor coursework to the individual learning styles of each student. However, in these situations, by being aware of their learning style, the students may contribute to their academic success by promoting self-awareness and their use of learning strategies that work for their learning style.<sup>16</sup>

There is substantial evidence for the existence of modality-specific strengths and weaknesses (for example, in visual, auditory, or kinesthetic processing) in people with various types of learning difficulty.<sup>17</sup> Furthermore, a person's preference as to whether tasks or activities are presented to appeal to auditory, visual, tactile or kinesthetic senses (modality preference) is an important consideration for educators.<sup>18</sup> Importantly, a number of strengths emerge from VARK analysis. For example, it offers a positive, inclusive affirmation of the learning potential of all students. The VARK philosophy encourages a belief that everyone can learn if their preferences are addressed. In addition, VARK encourages teachers to respect differences and reject negative judgments about learners.<sup>19</sup> VARK promotes the idea that students are able to learn in different ways, providing that the methods of teaching are appropriate to the students' preferences. The approach encourages learners and teachers to believe that it does not matter how people learn as long as they do learn.

## CONCLUSION

With our preliminary data, we conclude that there is a variety of learning styles present in the classroom, and

there are some students who are not addressed by the standard lecture format. Furthermore, this study demonstrated that students prefer multimodal and more of kinesthetic method of learning in spite of geographical differences. It is the responsibility of the instructor and the student to be aware of student learning style preferences to improve learning. As instructors, we need to assess and understand how to reach all students by understanding how to present information in multiple modes. We can help students more effectively both in and out of the classroom, if we are aware of their learning style and can assist them in determining their preferences.

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Written permission has been obtained from the Neil Fleming Copyright Version 7.1 (2011) is held by Neil D. Fleming, Christchurch, New Zealand.

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