

The Perceptual Preferences in Learning Among Dental Students in Clinical Subjects

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ABSTRACT

Introduction: VARK is a questionnaire which was developed by Neil Fleming (www.vark.learn.com), who was a teacher and an educator in New Zealand, with respect to the perceptual preferences in learning. V stands for Visual- the students learn best from pictures, graphs and diagrams. A stand for Aural – the students learn best from spoken words, lectures and discussions. R stands for Reading – the students learn best from reading and writing texts. K stands for Kinesthetic – the students learn best when they move their bodies and manipulate things with their own hands.

Aim: The aim of the recent study was to investigate the learning styles among the dental students in our clinical set up.

Method: The VARK-questionnaire contains 13 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 for each question, which is necessary for the identification of the poly modal modes of perception and learning. This is also a psychometric problem when an attempt is being made to state a measure of the reliability of the questionnaire. The VARK-questionnaire was distributed among 100 students and we received filled forms from only 70

students. This sample size represented a 70% response rate from the students in the class and it was markedly above the level which was required to make conclusions about the student preferences for receiving and processing information. The students spent about 10 minutes in an ordinary lesson to fill in the questionnaire. The students' register numbers and names were used in the study and no blinding was practised. We analyzed their learning styles with their performances in the university exams.

Study Design: This was a questionnaire based clinical study.

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

Conclusion: With our preliminary data, we conclude that the students in our clinical set up preferred a multimodal and a more of kinesthetic method of learning. To meet their needs, variations in the teaching, learning and the examination must be implemented. If not, the students with a high kinesthetic preference for perception and learning may be at the losing end.

Key words: VARK, dental education, kinesthetic, learning style

INTRODUCTION

The learning style is defined as the "composite of the characteristic cognitive, affective and the physiological characters that serve as the relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment [1]." The undergraduate dental education, as with any other educational program, needs ongoing improvements to meet the changing demands of the dental practice in the 21st century. Although the complexities of the dental care have increased dramatically over the last century, the method of teaching medicine has hardly changed. Recently, there is a widespread interest in the evaluation of the learning technique since its adoption.

Educational researchers have postulated that each individual has a unique learning style [2]. As health care educators, it is our responsibility to be aware of the learning styles of our students. The knowledge on the learning styles may help the educators in identifying and solving the learning problems among the students, thus helping their students to become more effective learners [3-6]. While doing so, it may be possible to reach out to more students because of the better match between the teacher and the learner styles. Many methods are available for assessing the learning styles, with each method offering a distinctly different view of the learning style preferences. VARK is a questionnaire which was developed by Neil Fleming [7], who was a teacher and an educator in New Zealand, who brought about a concept in the evaluation of the learning preferences among the population. The following are the internet links for the VARK homepage and questionnaire: <http://www.vark.learn.com/english/index.asp> and <http://www.varklearn.com/english/page.asp?p=questionnaire>. V stands for the Visual in which students learn best from pictures, graphs and diagrams. A stand for Aural – the students learn best from spoken words, lectures and discussions. R stands for Reading – the students learn best from reading and writing texts. K stands for Kinesthetic – the students learn best when they move their bodies and manipulate things with their own hands. The VARK questionnaire is an easy-to-use 16-question survey that provides the users with a profile of their learning preferences [8].

This method defines the preference in the 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 [9]. The Visual learners prefer the use of symbolic devices such as diagrams, graphs, flow charts and models that represent the printed information. The Auditory learners prefer "heard" information and, thus, they learn better through discussions, lectures, tutorials and talking, through material, with themselves or others. The 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 the 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 the principles

and advanced concepts. Some learners have a preference for any one of these learning modalities (unimodal learners), whereas the multimodal learners do not have a strong preference for any single method. They rather learn via two or more of the modalities. The multimodal learners thus are sub-classified as bi-, tri-, and quadmodal learners, who prefer to use two, three, or four styles, respectively.

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

SUBJECT AND METHODS

This study was conducted in the Department of Oral Medicine and Radiology, Manipal College of Dental Sciences, Mangalore, India, which was affiliated to Manipal University, India. A written permission through e mail was obtained for using the VARK questionnaire, from its developers. Individual consents were obtained from those who had volunteered to participate in the study. Self Response VARK questionnaires were administered to the junior residents who attended the clinical posting in the Department of Oral Medicine and Radiology. The participation was purely voluntary and to avoid biases and obligations, junior residents were chosen. The VARK questionnaire in which the subjects had to record their responses, was administered as a hard copy which had to be completed in the clinics. No interaction was allowed among the participants while they answered 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 represented one of the four modes of perception. But, one could select more than one answer to each question, which was necessary for the identification of the poly modal modes of perception and learning. This was also a psychometric problem when an attempt was made to state a measure of the reliability of the questionnaire. The VARK-questionnaire was distributed among 100 junior residents. They spent about 10 minutes to fill in the questionnaire. The VARK score was compared to their learning style preferences and their performances in the class 12, second BDS and the final BDS part 1 examinations.

STATISTICAL ANALYSIS

The data were reported as the percentages of the students in each category of the 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. The data was assessed by using the SPSS software, version 11.5.

RESULTS

Two hundred junior residents, 98 males (49%) and 102 females (51%) returned the completed questionnaires voluntarily. Their responses were tallied and assessed for their learning style preferences, the gender difference in the learning style preferences and the correlation between the learning styles and their performances in the examinations, [Table/Fig-1 and 2].

Forty nine students (23 males and 26 females) preferred the unimodal learning. Among the unimodal learners, two students (4.08% of 49 students) preferred the visual, 31 (49.2%) preferred the auditory, seven (11.1%) preferred the read-write and 23 (36.5%) preferred the kinesthetic modes of learning. One hundred and fifty two students (74 males and 78 females) 70.7% preferred the multimodal learning.

Among the multimodal learners, 38 (25%) students preferred the bimodal learning, 37 (24.3%) preferred the trimodal learning and 77 (50.66%) preferred the quadmodal learning.

VARK mode	Males (%)	Females (%)	Total
Unimodal			
Visual	1 (50)	1 (50)	2
Auditory	7 (30.4)	9 (34.6)	17
Read-Write	3 (42.8)	4 (57.2)	7
Kinesthetic	12 (52.1)	11 (47.9)	23
Total	23 (47.9)	26 (52.1)	49
Multimodal			
Bimodal	24 (63.2)	14 (36.8)	38
Trimodal	18 (48.6)	19 (51.4)	37
Quadmodal	32 (42.1)	45 (57.9)	77
Total	74 (48.7)	78 (51.3)	152

[Table/Fig-1]: VARK Score and gender preference

No gender differences were observed in the learning style preferences.

VARK Mode	Mean Class 12 marks (\pm SD)	Mean II BDS marks (\pm SD)	Mean IV BDS part I marks (\pm SD)
Unimodal	83.55 (\pm 8.75)	85.41 (\pm 8.4)	70.76(\pm 6.27)
Multimodal	82.15(\pm 9.02)	85.12(\pm 7.7)	69.01(\pm 8.68)
p value	0.755	0.962	0.429

[Table/Fig-2]: Learning style preference and performance

No significant correlations were observed between the learning style preferences and the performances in all the three previous examinations that were considered in this study. In the Class 12 or equivalent examination, the mean (\pm SD) percentages of the marks which were obtained by the unimodal learners and the multimodal learners were 83.55(\pm 8.75) and 82.15(\pm 9.02) respectively, ($p=0.755$). In the II BDS examination, the mean (\pm SD) percentages of the marks which were obtained by the students who preferred the unimodal learning and the multimodal learning were 85.41(\pm 8.4) and 85.12(\pm 7.7) respectively, ($p=0.962$). In the IV BDS Part I examination, the mean (\pm SD) percentages of the marks which were obtained by the students who preferred the unimodal learning and the multimodal learning were 70.76(\pm 6.27) and 69.01(\pm 8.68) respectively, ($p=0.429$).

DISCUSSION

Learning is never a burden if the new information which has to be grasped is presented in a style that is favourable to the students. If the learning could be made pleasurable, the performance in the examinations could improve. The onus is on the teacher to understand the students' learning styles and to adopt the appropriate teaching styles, rather than expect the students to adopt his/her style of learning. In our study, there was a wide diversity in the learning style preferences among the students, irrespective of the gender, with a majority of the students (70.7%) preferring the multimodal instruction. Nearly 36% (N=77) of the students preferred to use all the four modes of learning, followed by nearly 18% students who preferred either the bimodal or the trimodal learning. The auditory modality was the most preferred unimodal learning style among both male (45.8%) and female (50%) students, followed by the kinesthetic mode (41.7% males and 38.64% females). This might be due to the fact that the students had come to terms with (or at least were trying to) the teaching style which was adopted, which was predominantly didactic lectures. One way of testing this hypothesis is comparing the learning styles of these students to those in other institutes, where the teaching is not predominantly done through didactic lectures.

There was no correlation between the learning style preferences and performances, which probably proved that no learning style was superior; learning in the preferred style only makes the learning easier and enjoyable. This lack of correlation may also be due to the fact that the students from a dental college in India represented the crème de la crème of society, as far as good performances in the examinations were concerned. So, these students were able to perform well, regardless of the potential hurdles which had resulted from their mismatched learning styles. Unlike the results of the study which was conducted by Erica A et al., [10], we did not find any gender differences in either the learning styles or the performances.

The knowledge on the student preferred learning styles is vital, if we, as educators, are to provide tailored strategies for the individual students [9]. Knowing the students' preferred learning styles also helps in overcoming the predisposition of many educators to treat all the students in a similar way, as well as to motivate the teachers to move from their preferred mode(s) to using others. In doing so, they can reach out to more students because of the better match between the teachers and the learner styles [6,8,11-15]. There is definitely a trend in teaching, to instruct all the students in the same way, in a lecture format, because of the relative ease of passing the information, the need to cover the content, a long history of traditional lecturing, and perhaps due to their own preferences in learning, which may not be right always. The results of the present study should convince the teachers to use multiple modes of information presentation. This may demand the instructors to stray from their own preferred mode(s) of teaching and learn by using a variety of styles, which will positively affect the learning. By using a variety of teaching approaches, the teachers will reach out to more students because of the better match between the teachers and the learner styles. In some cases, it may be difficult to tailor the coursework according to the individual learning styles of each student. However, in these situations, by being aware of their learning styles, the students may contribute to their academic success by promoting self-awareness and their use of the learning strategies that work for their learning styles [16].

There is substantial evidence on the existence of the modality-specific strengths and weaknesses (for example, in the visual, auditory, or the kinesthetic processing) in people with various types of learning difficulties [17]. Furthermore, a person's preference as to whether the tasks or activities are presented to appeal to the auditory, visual, tactile or the kinesthetic senses (modality preference) is an important consideration for the educators [18]. Importantly, a number of strengths emerge from the VARK analysis. For example, it offers a positive and an inclusive affirmation of the learning potential of all the students. The VARK philosophy encourages a belief that everyone can learn if their preferences are addressed. In addition, VARK encourages the teachers to respect the differences and reject the negative judgments about the learners [19]. VARK promotes the idea that the students are able to learn in different ways, provided, the methods of teaching are appropriate to the students' preferences. This approach encourages the learners and the 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 a variety of learning styles are present in the classroom, and that there are some students who are not addressed by the standard lecture format. Furthermore, this study demonstrated that the students in our clinical set up preferred the multimodal and more of the kinesthetic methods of learning. It is the responsibility of the instructors and the students to be aware of the students' learning style preferences, to improve their learning. As instructors, we need to assess and understand as to how to reach out to all the students, by understanding as to how to present information in multiple modes. We can help the students more effectively, both in and out of the classroom, if we are aware of their learning styles and if we can assist them in determining their preferences.

LIMITATION

Our small sample size was the major drawback of this study.

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