

LEARNING STYLE OF USIM UDERGRADUATE DENTAL STUDENTS

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Abstract: *Background and Objectives:* Every dental student has his/her own learning style. As dental educators, it is mandatory to identify the fact that each individual student may have an inclination of obtaining knowledge and skill in one style over another. The aim of the present study was to determine the learning style preferences of dental students using the Visual, Aural, Read, Write, Kinesthetic (VARK) questionnaire. *Materials and Methods:* The VARK questionnaire was distributed to determine the student's preferred mode of learning. Completed questionnaires were scored and tabulated to determine the distribution of VARK preferences. *Results:* A total of 156 (89%) questionnaires were returned for further analysis. Majority of students have preferred a quad modal style of learning. Whilst only 6.5% from year 1, 5.7% from year 4 and 10% from year 5 who preferred a trimodal. *Conclusion:* The dental students in this study had varied learning preferences. As dental educators, we need to adopt different methods of teaching in order to reach most of the students and make the educational experience more productive.

Keywords: Dental, Learning Preferences, Students

Introduction

Accounting for individual learning styles is not a new idea. As early as 334 BC, Aristotle said that "each individual possessed specific talents and skills". In the early 1900's, several

personality theories and classifications for individual differences were advanced; these focused especially on the relationship between memory and visual or oral instructional methods. The research in learning styles then declined due to the emphasis on the student's IQ and academic achievement. In the last half of the 1900's, however, there has been a renewed interest in learning styles research and many educators are attempting to apply the results within the classroom.¹

Learning styles can be defined, classified, and identified in many different way. Generally, they are overall patterns that provide direction to learning and teaching. Learning style can also be described as a set of factors, behaviours, and attitudes that facilitate learning for an individual in a given situation.² Styles influence how students learn, how teachers teach, and how the two interact. Each person is born with certain tendencies toward particular styles, but these biological or inherited characteristics are influenced by culture, personal experiences, maturity level, and development. Style can be considered a "contextual" variable or construct because what the learner brings to the learning experience is as much a part of the context as are the important features of the experience itself. Each learner has distinct and consistent preferred ways of perception, organization and retention. These learning styles are characteristic cognitive, affective, and physiological behaviors that serve as pretty good indicators of how learners perceive, interact with, and respond to the learning environment.³

Students learn differently from each other and it has been determined that brain structure influences language structure acquisition. It has also been shown that different hemispheres of the brain contain different perception avenues. Some researchers claim that several types of cells present in some brains are not present in others.

The acronym VARK stands for Visual, Aural, Read/write, and Kinesthetic sensory modalities that are used for learning information. Fleming and Mills (1992) suggested four modalities that seemed to reflect the experiences of the students and teachers. Although there is some overlap between them they are defined as follows: visual (V) this preference includes the depiction of information in maps, spider diagrams, charts, graphs, flow charts, labelled diagrams, and all the symbolic arrows, circles, hierarchies and other devices, that people use to represent what could have been presented in words. It does NOT include still pictures or photographs of reality, movies, videos or PowerPoint. Aural (A) This perceptual mode describes a preference for information that is "*heard or spoken.*" Learners who have this as their main preference report that they learn best from lectures, group discussion, radio. The Aural preference includes talking out loud as well as talking to oneself. Often people with this preference want to sort things out by speaking first, rather than sorting out their ideas and then speaking. Read/Write (R) This preference is for information displayed as words. Not surprisingly, many teachers and students have a strong preference for this mode. Being able to write well and read widely are attributes sought by employers of graduates. This preference emphasizes text-based input and output – reading and writing in all its forms but especially manuals, reports, essays and assignments. Kinesthetic (K) By definition, this modality refers to the "perceptual preference related to the use of experience and practice (simulated or real)." Although such an experience may invoke other modalities, the key is that people who prefer this mode are connected to reality, "either through concrete personal experiences, examples, practice or simulation".⁴

Students' learning styles can be affected by several factors such as gender, age, academic achievement, and culture.⁵ Several studies have been conducted to investigate learning preferences of dental students in different parts of the world, however only one study has been done in Malaysia in 2017, Runki Saran and his colleagues conducted a research to determine

the learning style among dental students in one private university, they concluded that nearly 50% of 1st year students were quad modal whereas 55% of 2nd year students were unimodal in which kinesthetic preference was dominant.⁶

Thus, the aim of this research was to determine the learning style of USIM undergraduate's dental students.

Materials and Methods

This cross-sectional study was conducted among USIM dental students' of 2017/2018 academic session. This study was granted an approval from the Faculty of Dentistry USIM ethical committee. Before commencement, detailed information regarding the study was explained. Any incomplete and non-consented questionnaire collected after self-administration were disregarded.

An original validated English version of VARK questionnaire was used in this study. The questionnaire is available online for free to be downloaded with full instruction on the usage and analysis (<http://vark-learn.com/the-vark-questionnaire/>). The VARK questionnaire used evaluates four sensory modalities preferences namely; 1) Visual, 2) Auditory, 3) Reading-writing, and 4) Kinesthetics. It consists of 16 questions with each question has four options corresponding to the sensory modality preferences. Participants can choose more than one answer options given. Furthermore, any questions which did not applied to their preferences can be left unanswered.

For analysis purposes, compiled data was analysed using Statistical Package for Social Science (SPSS) version 21. The preference rankings were calculated by totalling all "V" responses (visual), all "A" responses (aural), all "R" responses (read/write), and all "K" responses (kinesthetics). Each category was equally weighted, and dominant preference was defined according to the categories and average scoring. For categories, the responses were classified into unimodal (V, A, R, K), bimodal (VA, VR, AR, RK), trimodal (VAR, VAK, VRK) and quad modal (VARK) using proportion. Whereas, the scoring of VARK was determined using mean and standard deviation. In addition, one-way ANOVA for comparison between year of study was performed. The *p*-value for this study was set at $p < 0.05$.

Result

A total of 156 students participated voluntarily in this study. The number represent about 89% of total dental students of USIM. Approximately 10% and 3% of fifth- and first-year students did not return their questionnaire respectively (Table 1).

Table 1: Distribution Of Students Participated In This Study According To Year Of Studying

Year of study (BDS)	n (%)
First	31 (19.9)
Second	35 (22.4)
Third	35 (22.4)
Forth	35 (22.4)
Fifth	20 (12.8)

Majority of participants preferred a quad modal style of learning (96%) compared to only 3.8% were trimodal. According to year of study, the trimodal style of learning were 6.5% from year 1, 5.7% from year 4 and 10% from year 5 (Table 2).

Table 2: Distribution Of Dental Students With Preferred Learning Style

Mode	Freq (%)				
	Year 1	Year 2	Year 3	Year 4	Year 5
Unimodal	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Bimodal	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Trimodal	2 (6.5)	0 (0.0)	0 (0.0)	2 (5.7)	2 (10.0)
Quad modal	29 (93.5)	35 (100.0)	35 (100.0)	33 (94.3)	18 (90.0)

Table 3 shows the significant difference of VARK mean score among the dental students of USIM using one-way ANOVA test. After using a Bonferroni post hoc-test, the result found that, Visual was significantly different between third year and first year (mean diff=2.695, $p=0.014$); and between third year and second year (mean diff=2.771, $p=0.007$). Whilst Auditory was significantly difference between third year and first year (mean diff=2.977, $p=0.001$); third year and second year (mean diff=3.314, $p<0.001$); third year and forth year (mean diff=2.714, $p=0.002$); and third year and fifth year (mean diff=2.679, $p=0.016$). On the other hand, Reading-writing was significantly different between third year and first year (mean diff=3.074, $p=0.001$); and between third year and second year (mean diff=2.514, $p=0.010$). Lastly, Kinesthetics was significantly difference between third year and first year (mean diff=3.358, $p<0.001$); third year and second year (mean diff=3.971, $p<0.001$); third year and forth year (mean diff=3.371, $p<0.001$); and third year and fifth year (mean diff=2.629, $p=0.004$).

Table 3: Comparison of VARK Mean Score Among Dental Students

VARK Mode	Mean (SD)				
	Year 1	Year 2	Year 3	Year 4	Year 5
Visual (V)	5.42 (3.72)	5.34 (3.33)	8.11 (3.40)	6.29 (3.26)	6.00 (2.49)
Auditory (A)	6.45 (3.09)	6.11 (2.65)	9.43 (3.33)	6.71 (3.06)	6.75 (2.47)
Reading-writing	4.35 (3.58)	4.91 (2.54)	7.43 (2.85)	6.14 (3.32)	6.45 (3.53)
Kinesthetics	6.87 (2.53)	6.26 (2.67)	10.23 (2.38)	6.86 (2.92)	7.60 (2.14)

ANOVA test showed of significant difference for V ($p=0.005$); A ($p<0.001$); R ($p=0.001$); and K ($p<0.001$)

Discussion

Mastering and picking up knowledge is never trouble if a new information has to be taught and captured by students is manifested in a term that is appealing to the students. If learning is to be made interesting, the performance in the examinations could improve. The onus is on the educator to understand and comprehend 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 dental students. Majority of them preferred a quad modal style of learning compared to other studies where their dental students preferred unimodal⁸⁻¹⁵. For instance, studies indicated that about 51 to 61% of first- and second-year students preferred unimodal style of learning⁸⁻¹¹. Whereas, 37 to 54% of studies among all dental students from first to fifth year students prefer unimodal

style of learning¹²⁻¹⁴. However, one study by Nasiri and colleague¹⁵ found that majority of their dental students in fourth-, fifth- and sixth-year prefer a trimodal style of learning (57%).

In comparison of VARK scores, third year students have higher V, A, R and K score than other year of study (Table 3). However, not many studies looking at the comparison except for Marwaha and colleague¹⁰. The problem was that, Marwaha studied between first- and second-year dental students. In our study it found that third year dental students have versatile style of learning than other year of study.

The results of our research would provide input on any improvement in future teaching process and serve as baseline data for future research on the teaching style in faculty of dentistry USIM. We hope these results would help us to improve our teaching learning activities and make learning a more beneficial experience for learners and teachers. Moreover, the awareness of learning preferences of the dental undergraduates will help the lecturers to develop appropriate teaching modalities to cater to the needs of their learners. This in turn will help to make the educational experience more productive.

The drawback of this present research was it carried out in a small sample at only one public university. Hence, future studies should include large sample with multicentric surveys.

Conclusion

The quad modal VARK style is the preferred learning method chosen by dental students. The VARK questionnaire is a relatively quick and simple tool to reveal the learning style preferences on an individual or a group level. Dental educators should adjust their delivery methods to approximate the learning preferences of their students. Dental students are encouraged to adapt a multimodal style of learning to improve their academic results.

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