

The Preferred Learning Styles Among the Undergraduate Dental Students at Foundation University College of Dentistry, Islamabad

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Author's Contribution

^{1,2,5}Substantial contributions to the conception or design of the work, Drafting the work or revising it critically for important intellectual content, Final approval of the version to be published, ³Substantial contributions to the conception or design of the work, ⁴Final approval of the version to be published, ⁴Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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ABSTRACT

Objective: To determine the preferred learning styles of undergraduate dental students at the Foundation University College of Dentistry, Islamabad.

Methodology: A cross sectional study was conducted at Foundation University College of Dentistry, Islamabad in January 2020 over a period of 2 weeks. On the basis of VARK questionnaire, learning styles of first to final year undergraduate dental students were analysed. The questionnaire consisted of 16 items and identified four different learning styles: visual, aural, reading/writing and kinaesthetic. A total of 132 students were included in this study. The filled out questionnaires were scored according to the VARK tool and then statistically analysed to determine the distribution of different learning styles among students.

Results: A total of 126 students out of 132 responded with the response rate of 95.5%. The results showed that the frequency of a single learning style (unimodal) in the study population was 63.5% while the frequency of a combination of different learning styles (multimodal) was 36.5%. The frequencies of bimodal, trimodal and quadmodal learning styles were 26.1%, 6.9% and 3.5% respectively. Among the unimodal learning style kinaesthetic topped the list with a frequency of 27.9% while among the bimodal learning styles auro-kinaesthetic was more frequent accounting for 10.9%.

Conclusion: The predominant learning style in our study population was unimodal and had a frequency of 63.5% with kinaesthetic being the chief preference making a major chunk of 27.9% followed by aural learners making up to 20.4%. In bimodal learning styles the most frequent in our study population was auro-kinaesthetic with a frequency of 10.9%.

Keywords: Learning, Medical education, Teaching.

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Introduction

Learning is something that happens organically and continues to occur unnoticed in many situations. Primarily, learning is adding new information to a person's existing volume of knowledge. Brown defines;

learning is mastering a subject or skill by study, experience or instruction, signifying that learning is a process that eventually leads to a developmental change.¹ Learning is not an action done to students; rather it is something students do themselves. There are different learning styles to acquire knowledge of subject either via

reading, researching, experimenting and others learning activities.²

In Pakistan the field of medical education has gained much attention and prominence in the last two to three decades. This shift in the mind-set can be partly attributed to the change in learning needs which are a result of the fast changing times. The readily available resources and increased exposure to the changing trends in medical education around the world have further influenced the learning and teaching styles.³ Student-centred learning has become the focus of attention among medical educators.⁴ An obvious change has been observed in preferring learner-centered teaching strategies like problem-based learning, from traditional didactic methods. To further improve these strategies, it is crucial to understand the students learning style and to adopt methods that fit best within it.⁵

Learning style is the unique manner in which each individual recognizes, processes, organizes, evaluates to retain new information. Keefe stated "learning style is the composite of cognitive, affective and physiological characteristics that serve as a relatively stable indicator of how a learner perceives, interacts and responds to the learning environment."⁶ The different learning styles widely recognized are based on the use of different sensory modalities. These include visual, aural, read/write and kinaesthetic. There is a remarkable diversity with regard to the learner's preference for the use of a single or multiple modalities.⁷ Different models have been developed to determine the student's preference.⁸

Based on the above mentioned four modalities a model was developed by Neil Fleming in 1987. This is known as the VARK questionnaire which is a simple, easily available tool that enables the student to recognize their preferred learning style/s.⁹ Visual (V) learners prefer to acquire information through the use of pictures, diagrams, flow charts, graphs and other symbolic representations. The aural (A) learners prefer learning through listening techniques, which primarily includes listening to lectures, discussing and talking through ideas and concepts. The read/write (R) learners learning preference is through the printed text and finally the kinaesthetic (K) learner prefers to learn through experience for which they may employ multiple sensory modalities. These learners prefer to learn by performing practicals, doing hands-on work and projects.¹⁰ Although VARK questionnaire provides a readily available

instrument to gauge students learning preference, it comes with its own set of limitations and cannot be considered a complete and absolute measure of learning preferences. This is because it does not address certain important parameters, for example level of interest and motivation, learners' socioeconomic status race and culture.^{11,12}

Many studies have used the VARK questionnaire to determine students learning preference. The results from these studies show a various variance and lie on both ends of the spectrum. These results can be best used by modifying our teaching methods accordingly to benefit the students. Different studies have shown a positive influence on learning when the teaching modality is matched to the learning style.¹³

Hence, it becomes even more essential to determine the students learning style in a given institute so that teaching strategies can be adapted to best suit the learning needs of the students. In addition having awareness about one's own learning style empowers the students to learn through a method most productive and effective for them. It enables the students to give meaningful feedback on instructional strategies and suggest modifications which suit them. Keeping in view these factors, it was considered appropriate to conduct a small local study to explore the learning styles of our students with the hope to tailor our teaching methods according to our students' learning needs. This study used VARK questionnaire to determine learning style preference among dental students at Foundation University College of Dentistry, Islamabad.

Methodology

This descriptive cross-sectional study was conducted at Foundation University College of Dentistry, Islamabad in January 2020 over a period of 2 weeks after it was reviewed and approved by the Institutes' ethical committee. Students belonging to all four years of BDS were included in this study.

Raosoft sample size calculator was used to calculate sample size using confidence level = 95%, response distribution = 50%, margin of error = 5% and a population size of 200.¹⁴ The final sample size was of 132. After obtaining informed consent, the questionnaire was administered to 132 students.

The VARK questionnaire, version 8.01 with given recommendations and guidelines was utilized for this

study.^{15,16} This questionnaire consisted of 16 items depicting different situations with four options each referring to a particular learning style (visual, aural, read/write and kinaesthetic). The purpose of the study and instructions to fill out the questionnaire were explained to students. Participants were expected to choose one or all four options representing a particular learning style for every situation giving a learning style or combination of learning styles was obtained for every situation. Thus every student contributed 16 responses consisting of a learning style or a combination of different learning styles. The data were analyzed by using SPSS software to calculate the frequency of different learning styles followed by the frequencies of different types of unimodal, bimodal, trimodal and quadmodal learning styles.

Results

Out of 132, 126 students completed the questionnaire with a response rate of 95.5%. Of them, 86.5% (n=109) were females and 13.5% (n=17) were males. All students contributed 2,016 preferences of a learning style or a combination of different learning styles to the study. Out of the frequency of a single learning style (unimodal) was 63.5% (n=1280) while the frequency of a combination of different learning styles (multimodal) was 36.5% (n=736). (Figure 1) Among the unimodal learning styles, the frequencies of kinaesthetic, aural, read/write and visual learning style were 27.9% (n=562), 20.4% (n=412), 8.4% (n=169) and 6.8% (n=137) respectively. (Figure 2) The frequency of different combinations of learning styles among the multi-modal preferences was 26.1% (n=526), 6.9% (n=139) and 3.5% (n=71) for bimodal, trimodal and quadmodal styles. The distribution of different combinations in bimodal learning styles is 3.8% (n=77), 10.9% (n=220), 2.7% (n=54), 3.1% (n=62) and 5.6% (n=113) for aural and reading/writing styles (AR), aural and kinaesthetic styles (AK), visual and aural styles (VA), reading/writing and visual styles (RV) and visual and kinaesthetic styles (VK) respectively. (Figure 3) The distribution of different combinations in trimodal learning styles is 1.8% (n=36), 3.1% (n=63), 1.3% (n=26) and 0.7% (n=14) for aural, reading/writing and kinaesthetic (ARK) style, visual, aural and kinaesthetic (VAK) style, visual, reading/writing and kinaesthetic (VRK) style and visual, aural and reading/writing (VAR) style respectively. (Figure 4)

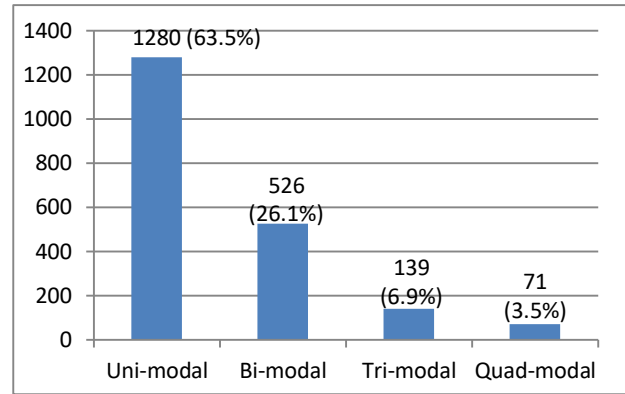


Figure 1: Frequency of different learning styles

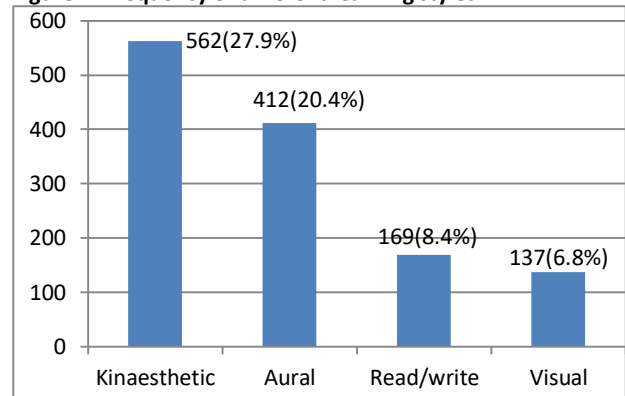


Figure 2: Frequency of different types of unimodal learning style

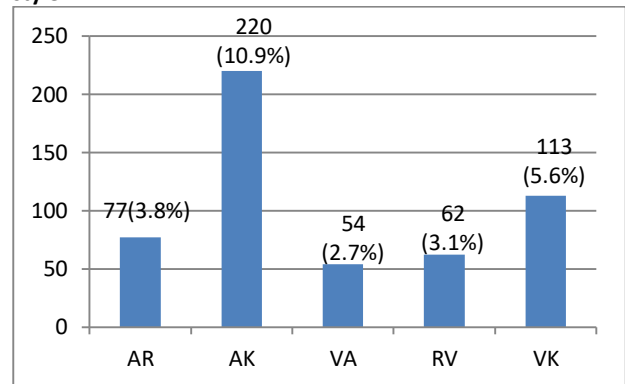


Figure 3: Frequency of different types of bimodal learning style

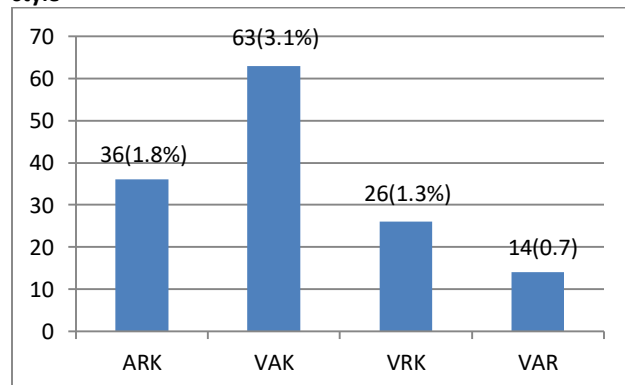


Figure 4: Frequency of different types of Trimodal learning style

Discussion

The VARK questionnaire is extensively used by analysts to determine learning style preferences.¹⁷ This is of particular importance in the field of Medical Education. As learning is a blend of knowledge, skill and aptitude that students develop to become well rounded doctors and professional individuals. Teaching is a process of deliverance of knowledge by engaging students in order to bring change in their behavior whereas learning is a process that is experienced by an individual through experience, knowledge and skill.¹⁸ This learning in turn depends on how well they can comprehend using their innate learning style.⁵

A study by AlQahtani et al showed that a majority of students preferred a single mode of learning.¹¹ Another study also showed similar results with 68.8% dental and 54.69% medical students preferring a unimodal learning method.^{7,19} However a study conducted by Marwa et al showed that 72.9% medical students preferred multimodal learning style.⁷ Another study by Poonam et al also showed that about 61 % students preferred multimodal learning.²⁰

Our study showed that unimodal learning style was predominant with a prevalence of 63.5% with kinaesthetic being a primary choice making a major chunk of 27.9% followed by aural learners making up to 20.4%. This conformed with a study carried out in New Zealand, with students opting for single modal of learning making up to 62.3% out of the popular four VARK Learning styles.²¹

Among the bimodal learning styles the most widely preferred combination in our study population was auro-kinaesthetic comprising of 10.9% of all preferences. This supported the findings of Rezigalla and Ahmed who showed that auro-kinaesthetic learning style was the most frequent preference among the bimodal learning style in their study.²² However in unimodal learning style the most frequent was aural (55.9%) in contrast to our study where the most frequent unimodal learning style was kinaesthetic (27.9%) followed by aural (20.4%).

The idea of different learners having different learning styles needing different teaching strategies is however not universally accepted as yet. There are people questioning the validity of this idea claiming the scientific proof in this regard is very little apart from disagreements on how to measure learning styles. They also emphasize that “theoretical basis for the assumed interactions between

learning styles and instructional methods is very thin and significant empirical evidence for the learning-styles hypothesis is almost non-existent.”^{23,24} Keeping in view some educationists favour alternative approaches to learning style theories which are “grounded in research and based on solid theoretical frameworks in cognitive and developmental psychology.”²⁵ These observations warrant further studies in to learning styles and their interaction with the teaching methods.

Our study was limited by the fact that the study population was restricted to one particular institute and the number of participants was too small to allow generalization of results. Moreover the study population consisted predominantly of females with only 13.5% of the participants being males. Apart from this, the questionnaire used did not take in to account the individual characteristics of the participants who could act as confounders. It is, therefore, recommended that studies with larger and diverse study population should be conducted to increase the validity of results.

Learning style studies, if conducted on a larger scale can serve as a guide helping the educationists to tailor our teaching strategies according to the learning needs of our students. These findings can also be helpful for students who would have better insight in to their learning preferences and thus get benefitted by choosing learning habits best for them.

Conclusion

The predominant learning style in our study population was unimodal and had a frequency of 63.5% with kinaesthetic being the chief preference making a major chunk of 27.9% followed by aural learners making up to 20.4%. In bimodal learning styles the most frequent in our study population was auro-kinaesthetic with a frequency of 10.9%. Larger studies are needed to look in to the learning style preferences of our students which will help us in devising appropriate teaching methods.

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