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Evaluation of Learning Styles in the Field of Dentistry from Beginners to Advance Level

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ABSTRACT

Objective: This descriptive, cross-sectional study aimed to evaluate the learning style and the learning outcome amongst students of different levels of study.

Materials and Methods: A known system; Visual, Aural, Read/write, and Kinesthetic (VARK) was used to analyze the learning outcome of the 235 students, interns and faculty members from Hamdard University Dental Hospital. This study was carried out on all levels of the students and faculty members, (a total of 235 members including Professors, Lecturers, Interns and students from all levels). A valid and known questionnaire VARK was used to analyze the learning outcome amongst the subjects, and the results were then analyzed statistically.

Results: During the initial years of the BDS, students learn more by listening, aided by reading and writing in their second year, while Kinesthetic in their clinical year. Postgraduate students and lecturers depend more upon their kinesthetics. Keeping in mind the interest of the senior faculty more in research, their learning styles are more on reading and writing aided by kinesthetic and aural supports.

Conclusion: The learning styles vary from age to age amongst the same person, and students, as well as teachers, must understand their art of learning and deliver better results.

Keywords: Learning Outcomes, Teaching Style, VARK Learning Style

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INTRODUCTION

Learning goes around throughout one's life. The ways of learning or in other words, the learning styles may differ or modify with age and even may vary on a person-to-person basis. Different models have been developed over time to indicate students' overall approaches to learning and their perceptions of the teaching-learning environments.[1] One of the most commonly used models is the VARK model designed by Fleming and Baume, which categorizes learning preferences into four modes of sensory pathways: visual (V), aural (A), read/write (R), and kinesthetic (K).[2] It is mostly considered the teachers' responsibility to identify the student's learning styles and work effectively on them, individually for a better result.[3] It is hence the responsibility of the teacher to continuously upgrade themselves and also analyze the students learning style for a better outcome.[4,5]

Medicine is a complex and special field of study. It requires thorough learning throughout the career. Whether it be the trainer or the trainee, they are regularly required to upgrade and keep them up to date to meet the new and emerging standards of the current world. It is therefore recommended to explore and adapt newer strategies of learning styles to get a better understanding.[6] Being a more practical based discipline with more motor skills involved, Dentistry can become much easier and conveniently understandable, if a proper learning strategy is acquired.[7] Moreover, to make an effective educational curriculum, it is important to identify students learning style preferences.[8]

Based on the current need and advancement in Medical Education, this study was planned to help guide the dental trainers and trainees to self-analyze themselves to identify, understand and furnish their learning styles for a better understanding of the subject and hence become a much better practitioner and academician in the future.

MATERIALS AND METHODS

This descriptive, cross-sectional study was conducted at Hamdard University Dental Hospital, Karachi, Pakistan from June to August 2018. Ethical Review Board approval was taken before this study (Ref. No. HCM&D/HUDH/147: 115-06-01-18). Further proper copyright permission was attained from the VARK team before conducting the study (Reference No. VCP 2511875 dated November 26, 2022).

A total of 235 students, faculty and interns (105 males and 130 females) were included in this survey. Among them, 32 students from 1st Year BDS, 28 students from 2nd year BDS, 31 students from 3rd year BDS, 45 students from Final year BDS, 59 House Officers, 17 lecturers, 10 Postgraduate students, 3 Senior Registrars, 5 Assistant Professors, 2 Associate Professors and 3 Professors were given the survey form online to fill at https://vark-learn.com/the-vark-questionnaire/. The percentile test scores were taken and tabulated. The VARK is a validated questionnaire system[9], which analyzes the preferences of the learner that he or she has gained or developed with time after the experience.

The VARK questionnaire comprises 16 questions. Each question has 4 choices corresponding to the 4 sensory modalities preferences of student learning that were described in a 1992 study by Fleming and Mills[10], i.e., visual, auditory, reading/writing, or kinesthetic. The students were instructed to choose the answer that best described their preference. They were allowed to choose one or more than one answer or even to leave out a question if they felt that it did not apply to them. The distribution of the VARK preferences was calculated according to the guidelines mentioned on the VARK website (https://vark-learn.com/). Completed questionnaires were scored and tabulated to determine the distribution of VARK preferences. Preference rankings were calculated by totalling all "V" responses (visual), all "A" responses (aural), all "R" responses (read/write), and all "K" responses (kinesthetic). Each category was equally weighted, and dominant preference was defined by determining which category received the most responses. The questionnaire was previously administered to diverse populations including dental students without any alterations in items.[11] Descriptive statistics were done on the overall sample.[12] All analyses were done using IBM SPSS statistical software, version 24 (IBM Corporation, New York, New York).

RESULTS

The percentile results were gathered and tabulated and it was found that the learning perceptions changed with each year among the students and teachers as shown in Table 1. During the initial years of the BDS, students learn more by listening, aided by reading and writing in their second year, while Kinesthetic in their clinical year. Postgraduate students and lecturers depend more

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upon their kinesthetic. Keeping in mind the interest of the senior faculty more in research, their learning styles are more on reading and writing aided by kinesthetic and aural supports. No gender difference was evident, so it was not included in the table.

Table 1: Mean Scores of the VARK Analysis for Learning Preferences

Respondents	Visual	Aural	Read/ Write	Kinesthetic
1st Year BDS	3.50	5.13	5.78	4.38
2nd Year BDS	3.68	5.25	5.00	4.32
3rd Year BDS	4.48	7.00	5.42	5.84
Final Year BDS	4.69	6.27	4.89	6.13
House Officers	5.86	7.34	6.10	7.20
Postgraduates	6.80	6.80	6.40	8.10
Lecturers	5.47	5.12	5.35	6.06
Sr. Registrars	5.67	5.33	6.67	4.00
Assistant Professors	6.20	7.00	8.40	8.80
Associate Professors	7.50	12.0	9.50	10.50
Professors	5.67	7.33	7.67	10.33

DISCUSSION

This study reveals the changes in learning styles and preferences of learning shifts from one way to another with time and experience. Therefore, it is the need of the time to plan our curriculum with the mixed model, including activities encompassing all four components of VARK (Visual/ Auditory/ Read or Write and Kinesthetics) for better understanding amongst the learners and also encompass all types of learners.

As per this study, it was evident that during the first year, when the students have no experience in dental studies, they prefer writing and reading more than other modes of study. During the second year, this mode was slightly shifted towards listening along with reading preference. During the clinical years, the students start depending more upon listening with tactile approaches, which is much reinforced during their house jobs, where they had a much lighter schedule of studying, with more emphasis on learning the new techniques. These results were in line with the study by Deshpande *et al* [13] and Mozaffari *et al*.[14]

In higher studies, students develop more expertise and maturity in their basic skills, with a sufficient cognition level, but are more interested in the latest research and methodologies trending around the world. Hence, they adopt a balanced multi-modal approach, which comprises a blend of learning by working style aided by a very poised visual and aural support, with knowledge about the latest research (reading). This graph was seen rising with the experience within the doctors at the lecturer to Professor level to learn by doing, aided with studying more about the topic. Results of previous studies are in agreement with multimodal style being the dominant learning preference.[15,16,17] This study further showed that there was no major correlation between the learning styles and the gender of the students, the students of a particular age had a particular learning style regardless of their gender. This is also evident from the previous study by Shrestha *et al*, that gender has no significance in learning or learning style.[15]

As stated by Stirling *et al*[16], the new curriculum should be made with the awareness of the learning preferences. The current study also supports that learning by doing is important for clinicians, but prior knowledge of that is given by listening and reading about that skill. A student watches his demonstrators and learns by watching, further furnished by reading literature and hence examined by practical.

Medical education teaching in Pakistan has been the same for the past few decades. Only recently, due to COVID-19, educators were forced to include an online teaching component. We believe our study provides insight into the evolved learning preference styles of

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medical and dental students. Health professional educators can use this information and modify their teaching design to better accommodate today's students. Similarly, students should also be encouraged to learn from diverse teaching styles.

Limitations of the study include the lack of generalizability due to the low sample size. Our study was time-restrained, and thus, we stopped data collection due to time saturation. Follow-up studies with a larger sample size are required to obtain generalizability. Similarly, follow-up qualitative studies are required to further explore the reasons behind this change and to explore any cause-effect relationship between online teaching learning and learning preference style.

CONCLUSION

It can therefore be concluded that a student shifts his/her learning style with time, age and experience. This can only be judged on an individual basis. These variations depend upon their exposure to clinics, and the responsibilities given to them. Overall, the results showed that teachers should redesign their curriculum with the priorities given on the components required by their students. Our study showed that during the initial ages, students needed a more reading and writing approach, but in the later years, their learning styles were shifted towards more kinesthetic. If this should be kept in mind during teaching, the outcomes for the students coming into the market in the new era would be much different.

DISCLAIMER

None to declare.

CONFLICT OF INTEREST

There is no conflict of interest among the authors.

ETHICAL STATEMENT

Ethical approval was obtained from the Ethical Review Board of Hamdard University Dental Hospital, Hamdard University (Ref. No. HCM&D/HUDH/147: 115-06-01-18).

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