Influence of Learning Style Preferences on Dental Student Performance in Preclinical Subjects

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Abstract: Objectives: The aim of this study is to investigate the learning style preferences of a group of preclinical dental students and explore their relationship to gender and academic performance in the various preclinical subjects.

Methods: The sample of this study was a purposive sample of 176 dental students who have just finished the third year of the 6-year bachelor of dentistry program at King Abdulaziz University Faculty of Dentistry in Saudi Arabia. The Visual, Aural, Read/write, and Kinesthetic (VARK) questionnaire was used to determine the students’ preferred mode of learning. This sixteen-item questionnaire defines preference of learning based on the sensory modalities: visual, aural, reading/writing, and kinesthetic. Descriptive and correlational statistics was used to determine potential relationships with student scores in preclinical subjects as well as their total GPA and demographic variables.

Results: More than half (56 %) of the students were found to have multimodal learning preferences. The most preferred learning modality was kinesthetic in both males and females (M=26.8%, F=18.9%), followed by Read/Write (M=9.8%, F=11.3%). There was a significant correlation between aural learning preference and grade performance in microbiology (p=0.039) & pharmacology (p=0.014), there was no significant association between GPA or other subject grades and learning style groups.

Conclusions: Learning styles account for a difference in some but not all basic-science subject performance. Alternative ways of understanding student learning preferences may yield better insight into the determinant of variations in their grades.

1. Introduction

Prior work supports the validity of the idea that different learning styles exist in different students. Awareness of student learning styles may help both students and instructors fulfill the objectives of the educational process. [1,2,3] In dentistry, and particularly in Saudi Arabia, studies investigating learning styles are not vast. The only significant work up to our knowledge in this area is that of Al-Saud who studied learning styles of first year dental students. [4] In addition, Alqahtani & Al-gahtani tried to correlate learning styles with GPA for dental students and interns. [5]

Therefore, it is not sufficiently known whether specific learning styles confer specific advantages in studying specific subjects in dentistry or whether they are correlated with the overall GPA. This study attempts to focus on preclinical subjects to explore the influence of student learning styles on their performance in preclinical subjects. The objectives of this study are to identify the dominant learning styles and learning preferences in a sample of dental students who have just finished their preclinical years at the King Abdulaziz University Faculty of Dentistry (KAUFD), and then examine their association with gender and academic performance in preclinical subjects.

2. Materials & Methods

We used a purposive sample of dental students who have just finished their 3rd year out of the 6-year bachelor of dentistry program at KAUFD. The 4th year is the last pre-clinical year in the program. Out of the 188 (females, 109; male, 79) students who were invited to participate, 176 (females, 97; male, 79) responded, with a response rate of 93.6%. Ethical approval was granted from KAUFD.

The Visual, Aural, Read/write and Kinesthetic Inventory (VARK) [6], is a well-known learning style questionnaire with valid and reliable results. It measures four sensory modalities used for learning, Visual, Aural, Read/Write and Kinesthetic. The questionnaire has 16 multiple choice questions. Each question gives the reader a scenario and allows for the adoption of 4 sensory learning modes: Visual (V): Learners who prefer the use of diagrams, charts and graphs, Aural (A): Learners who prefer heard information e.g. lectures and group discussions, Read/write (R): Learners who prefer printed words and texts, and Kinesthetic (K): Learners who prefer learning through manual practice and experiences using all their senses (sight, smell, touch, taste and hearing).

Descriptive and correlational statistics were used (t-test, chi-square test, ANOVA). IBM SPSS-20 statistical software was used for the analysis.
3. Results

Analysis of our data showed that only 9% of students were unimodal in their learning style. The majority were multimodal, more commonly bimodal than trimodal (figure 1). Nonetheless, the majority (n=156) identified certain single specific modalities as their preferred ones (shown in figure 2). Pearson’s correlation did not show any statistically significant correlation between learning style scores and subject scores, with the exception of microbiology ($r= 0.16$, $p=0.03$) and pharmacology ($r= 0.19$, $p = 0.01$) each correlating with aural learning scores. One-way Anova comparing means of grades across VARK categories revealed no significant differences between the groups in any of the subjects or in the GPA. Results did not change when analysis was carried separately for males and females, nor when all the unimodal, bimodal, and trimodal subjects were grouped together, nor when preferred single modalities were compared among multimodal individuals.

4. Discussion

Even though the majority of our students had preferred certain single modalities of learning styles of learning, the vast majority utilized multimodal learning styles. This is similar to other studies done on dental students [7, 8].

The most preferred modes of learning were AK (26%), followed by VK (16%) and VAK (14%). The most preferred modalities of learning were aural and kinesthetic. This is similar to what was previously reported by Al-Saud [8], which found Aural to be the most preferred. The same preference was found by Kaczmarek [8] on dental students in Poland. Murphy et al. [9] found read/write as the most dominant preference among dental students in a U.S. sample. The only significant correlation found in our sample was found between aural learning skills and the scores of microbiology and pharmacology. This may be related to the subject matter that involves a lot of terminology and new names of organisms and chemicals.

There was no correlation otherwise between the VARK-assigned learning style category, the preferred learning mode, or the dimensionality of learning modes with any subject grade scores or the GPA.

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6. References


