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# Learning Preferences And Strength For Dental Student

A graduation project is submitted to the council of college of dentistry in  
partial fulfillment of the requirement for the degree of bachelor in  
college of dentistry

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

{ فَرِحِينَ بِمَا آتَاهُمُ اللَّهُ مِنْ فَضْلِهِ }

صدق الله العلي العظيم

## Certification of the Supervisor

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## الإهداء

من قال أنا لها "نالها"

وأنا لها وإن أبت رغماً عنها أتيتُ بها . نلتها وعانقت اليوم مجداً  
عظيماً فعلتها بعد ان كانت مستحيله ، كانت دروباً قاسية وطرقاً  
خسرت بها الكثير ولكني "وصلت"

الحمد لله حباً وشكراً وإمتناناً ، الحمد لله الذي بفضلله ادركت اسمي  
الغايات انظر لنفسى والنجاحى كالذى ينظر الى معجزته ، إلى الحلم  
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## List of Abbreviations

| <b>Abbreviations</b> | <b>Meaning</b>                         |
|----------------------|--|
| <b>(VARK)</b>        | Visual, Aural, Read-Write, Kinesthetic |
| <b>GPA</b>           | Grade Point Average                    |
| <b>V</b>             | Visual Learners                        |
| <b>A</b>             | Auditory Learners                      |
| <b>R</b>             | Read-Write Learners                    |
| <b>K</b>             | Kinesthetic Learners                   |

## **Introduction**

Learning style refers to various approaches of taking in, organizing and processing stimuli or information. It involves educating methods, particular to an individual that are presumed to allow the individual to learn best. Several studies have shown that there is a lot of variation in the learning style of students. Learning styles can be assessed in several ways, among which Neil Fleming's Visual, Aural, Read-Write, Kinesthetic (VARK) model is one of the commonly used assessment methods **(Davidson GV,2018)**.

Learning preferences and strengths should focus on the prevalence of multimodal learning, with a strong preference for kinesthetic and auditory styles, and also include the importance of self-assessment and adaptability for success. questionnaire as a tool, the link between learning style and GPA, and the need for educators to adapt teaching methods to improve student outcomes **(Khalid MS,et al.,2019)**.

Multimodal preference The majority of dental students prefer multimodal learning, which involves a combination of different learning styles the Dominant styles most common learning styles are kinesthetic (learning by doing) and auditory (learning by hearing). Unimodal preference A significant minority of students may prefer a single learning style. Students with lower GPAs are sometimes found to have a stronger preference for unimodal learning **(Shenoy N, et al.,2019)**.

Gender differences show minor differences in preference between genders, though some research found no significant link between learning style and academic performance in either gender **(Fleming N. et al.,2022)**.

Potential strengths Self-assessment Dental students must develop the ability to accurately self-assess their strengths and weaknesses, which is critical for long-term success adaptability While certain learning styles may be preferred, students often need to develop a multimodal approach to learning to be successful, especially as the curriculum is complex and requires integrating various skills **(Navin R,et al.,2019)**.

Accurate self-assessment reflects an ability to accurately assess one's strengths and weaknesses and is an underlying feature of self-directed lifelong learning. However, the role of students' self-evaluation remains controversial despite some attempts to clarify this aspect through comparisons with peer-review and faculty evaluations . Especially, the sex-based difference in self-assessment scores is still a controversial issue. Several studies revealed that students' sex did not affect self-evaluation **(Gruppen LD, et al.,2019)**.

However, other studies have found that gender does affect self-evaluation. and some other researchers advocated in their article that female students tend to underestimate themselves compared with male students on self-evaluation **(Lind DS,et al.,2020)**.

## **Aim of The Study**

To identify how the students prefer to receive and process information often using the VARK model (Visual, Auditory, Read/Write, Kinesthetic) to improve teaching effectiveness, tailor curriculum, and enhance academic performance.

# Chapter One

## Review of Literature

### 1.1 Definition Learning Preferences

The individual, favored methods and environments a person prefers when acquiring, processing, and retaining new knowledge. Rather than fixed "styles," these tendencies such as visual, auditory, or hands-on help learners engage more effectively by matching teaching styles to their strengths, which can improve motivation **(Good et al.,2023)**.

### 1.2 VARK Model

Over the past four decades, numerous models have been developed to characterize learning style preferences in pedagogy.<sup>3,8,9</sup> One of the more commonly used models to categorize instructional preferences is Neil Fleming's VARK model, which classifies the learning preferences based on

the sensory pathways into four modes: visual (V), aural(A), read/write (R), and kinesthetic (K). A visual (V) learner prefers the use of charts, diagrams, and other forms of illustrative imaging to acquire information. An auditory(A) learner prefers the spoken word through lectures, podcasts, and oral discussions as the means of learning **(Leite et al.,2020)**.



**Figure.1** VARK Model

The read/write (R) preference is when the acquisition of new information is done through the printed word via books and handouts, and tables and lists, and using writing to record and recall new information. A kinesthetic (K) learner prefers to experience or participate in a physical activity in order to learn. This can involve field training, workshops, role playing, and other modalities and is considered a combination of sensory learning pathways (Alkhasawneh.2023).

A learner's style preference can be singular with one main preferred modality, bimodal with two preferences, trimodal with three, or quad modal with the preference including of all four types. As a tool to evaluate learning style preferences, the VARK questionnaire has achieved widespread use among different study populations in undergraduate and postgraduate settings. This is due to its simplicity, relative ease of

implementation, good reliability, and validity (**Paiboonsithiwong et al.,2019**).

### **1.2.1 Visual Learners (V)**

Visual learners excel at processing information they can see and interpret. This means they thrive on charts, diagrams, graphs, pictures, flowcharts and demonstrations. Video is a particularly effective way of getting through to them. Typically, visual learners have great spatial awareness and can easily remember details from images or illustrations. They're good at interpreting visual data and following step-by-step instructions (provided they are accompanied by images). Lengthy text-based explanations or lectures without visual aids can pose a challenge for visual learners. They may struggle to stay engaged and retain information if they lack the visual stimulation they crave (**Pungente et al.,2023**).

### **1.2.2 Auditory Learners (A)**

Auditory learners learn best by hearing information presented verbally. They're the ones who actively participate in class discussions and soak up knowledge through lectures and presentations. They also benefit from group work, podcasts and audiobooks. Typically, these learners have strong memories for spoken information and excel at following instructions or learning through storytelling. They are often happy to participate in discussions and tend to be good communicators. Like visual learners, auditory learners are likely to struggle with lengthy written materials. They'll find it challenging to concentrate in noisy environments, and may choose not to participate in hands-on activities(**Zhao and Potter.2019**).

### **1.2.3 Read/Write Learners (R)**

Read/write learners thrive on information presented in text format. This includes textbooks, articles, written instructions and notes. Fleming introduced this category to capture a separate preference from visual learning. As you might expect, these learners have excellent reading comprehension and written communication skills. They're great note-takers and can effectively organise information through their writing. That said, they may struggle with lectures, presentations and demonstrations that lack clear structure. To help overcome this challenge, you should consider producing written handouts or follow-up documents (**Pungente et al.,2023**).

### **1.2.4 Kinesthetic Learners (K)**

This brings us to our last learning style. Kinesthetic learners excel at learning through movement and by getting hands-on. They thrive on activities, experiments, simulations, demonstrations, and role-playing scenarios. Kinesthetic learners often have excellent hand-eye coordination and spatial awareness. They're 'doers' and active participants, so tend to retain information best when physical engagement is required. On the other hand, they may find it difficult to stay focused in environments that require long periods of sitting still. With this in mind, traditional lectures or lengthy written materials are likely to present a real challenge (**Good et al.,2023**).

### **1.2.5 Learning Preferences Impact Educational Strategies In The Classroom**

Learning preferences significantly impact educational strategies by guiding educators in choosing appropriate teaching methods that resonate with students' unique ways of processing information.

When teachers understand their students' preferred learning styles, they can adapt their instruction to incorporate a variety of techniques, such as visual aids or hands-on activities. This tailored approach not only increases student engagement but also promotes deeper understanding and retention of material **(Navin R,et al.,2019)**.

### **1.2.6 A Multimodal VARK Learning Preference**

Which is found to be typical in all adult learners, and is in agreement with previous learning style preference investigations of medical and dental students. preferences for bimodal, trimodal, and quadmodal learning styles represented about equal proportions as the multimodal preference. Among the bimodal learning styles, AK was the most preferred, which is in agreement with Al-Saud's observation among the Saudi dental students **(Vaughn and Baker.2018)**.

The type of unimodal learning style preference was also in agreement with the Al-Saud's study, with the majority of the respondents' preferences being either aural (A) or kinesthetic (K). Among the trimodal learning styles, VAK was the most preferred, which is in contrast to the Al-Saud study which found the ARK modality to be the most preferred **(Fleming and Mills.2021)**.

### 1.2.7 The Distribution of Learning Preferences

With over a million learners having completed the VARK questionnaire, it has become a significant source of data on self-reported learning preferences. Let's delve into the questionnaire results, starting with the distribution of learning style preferences.

- Visual Preference: 1.9%
- Aural Preference: 5.7%
- Read/write Preference: 3.3%
- Kinesthetic Preference: 23.2%
- Multimodal Preference: 66%

The data reveals some interesting trends. Kinesthetic learners appear to be the most common single preference, whilst visual learners are a rare breed. This aligns with the 70:20:10 model, which suggests that the majority of learning happens through experience (**Zhao and Potter.2019**).

However, the most popular category (by far) seems to be learners with a multimodal preference. Of these multimodal learners, 20.1% have a preference for two styles, 15% have a preference for three styles and 31% have a preference for four styles.

In other words, despite the VARK model's best attempts, the majority of learners cannot be neatly categorised. Indeed, there are more learners that have a preference for all four styles (31%) than there are those with the most popular single preference (23.2%). When learners were asked if their learning style matched their own perception of how they learn, 72% said that it did. What's more, 80% of survey respondents said that they expected VARK to be helpful for their learning(**Zhao and Potter.2019**).

### **1.2.8 Evaluate The Implications Of Ignoring Learning Preferences In Educational Settings And Its Potential Long-Term Effects On Students.**

Ignoring learning preferences in educational settings can lead to disengaged students who struggle to grasp material presented in ways that do not align with their cognitive styles.

This lack of adaptation may result in poor academic performance and decreased motivation over time, ultimately affecting students' self-esteem and interest in learning. Furthermore, such an oversight can perpetuate inequities in education by failing to support diverse learners adequately, limiting their potential and hindering their development into lifelong learners capable of critical thinking and problem-solving (**Fitkov-Norris and Yeghiazarian.2020**).

## Chapter Two

### Discussion

There is a relative abundance of studies looking at the different learning styles in variable fields of study such as medicine engineering, nursing, and allied health specialties. Existing studies examining VARK learning preferences among dental students are few with some limitations. The objective of this study was to investigate the learning preferences of dental students in Saudi Arabia, while examining the effects of gender, GPA, and academic level on the learning style preferences **(Ictenbas and Eryilmaz.2021)**.

All students included in many studies finished the university preparatory year before starting the required five years of dental school. This allows for inclusion of GPA as an indicator for past academic performance.. The response to such study was much higher from the male students compared to the female counterparts. Since there are separate campuses for male and female students, differences in scheduling of classes and exams might have contributed to the disparity between male and female student participation **(Romanelli et al.,2019)**.

More than half of the participants in many studies had a multimodal VARK learning preference, which is found to be typical in all adult learners, and is in agreement with previous learning style preference investigations of medical and dental students. Preferences for bimodal, trimodal, and quad-modal learning styles represented about equal proportions as the multimodal preference. Among the bimodal learning styles, AK was the most preferred, which is in agreement with Al-Saud's observation among the Saudi dental students. The type of unimodal learning style preference was also in In

terms of gender preferences, female dental students showed a significantly higher preference for bimodal learning styles compared to their male counterparts **(Nasiri et al 2021 and El Tantawi,2022 ; Almigbal.2019).**

Female participants also showed a more equal distribution across the different VARK modalities when compared to males . Before joining the university, Saudi children undergo a 12-year school education that is gender segregated from elementary to secondary grades with different curriculums. This early and prolonged segregation could have led to differences in learning preferences that persist into the university levels **(Pyle et al.,2020).**

## **Chapter Three**

### **Conclusion**

The majority of the dental student participants were found to have a multimodal learning style preference. Gender differences in the learning style preferences exist, with female dental students more likely to having a bimodal preference instead of a unimodal preference compared to their male counterparts. Students with a multimodal learning style tend to have achieved better academic results in the past

Realizing the importance of learning preferences of individual students can help teachers to better prepare for their class. Understanding and catering to each student's individual preference may not be possible all the time but proper lesson planning and inclusion of various teaching and learning tools may help to all this gap.

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