

# ORIGINAL ARTICLE

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## Assessment of the Learning Styles of Undergraduate Dental Students in Preclinical Years

## Diş Hekimliği Öğrencilerinin Klinik Öncesi Yıllarda Öğrenme Stillerinin Değerlendirilmesi

### ABSTRACT

#### Objectives:

The aim of this study was to assess the learning styles of undergraduate dental students in preclinical years at Akdeniz University in Antalya, Turkey.

#### Materials and Methods:

The research population consists of all undergraduate students in preclinical years (Year 1 to 3,  $n = 144$ ). A total of 122 students (85% of the research population) who gave full answers to the questionnaire were determined and included in the analysis. Questionnaires with incomplete answers or errors were excluded (15%,  $n = 22$ ). To reveal the students' learning styles, Kolb's learning style inventory and another questionnaire seeking demographic characteristics were used. Statistical analysis was performed using the chi-square test was used to investigate whether any differences existed in the learning styles and the examined variables.

#### Results:

The distribution of learning styles was mainly assimilators (44.3%) and divergers (37.7%) groups. It was determined that there was no significant difference in learning style distribution among the years ( $P < 0.05$ ). According to the questionnaire related to demographic characteristics of the students (gender, high school graduation, choosing dentistry with their request, place of residence, parents' educational background), there was no statistically significant difference between learning styles and the examined variables. To the literature, the majority of the students who choose the health area were from the assimilators and divergers group. The findings obtained at the end of the study showed that the great majority of the students were similar.

#### Conclusion:

This study is the first study aiming to reveal the learning styles of dental students in our country. Our findings are similar to the studies in the literature. More research with larger groups is needed to generalize our results.

#### Key Words:

Learning styles, Dental students, Preclinical years

## ÖZ

### Amaç:

Bu çalışmada, Akdeniz Üniversitesi Diş Hekimliği Fakültesi klinik öncesi yıllardaki diş hekimliği lisans öğrencilerinin öğrenme stillerinin değerlendirilmesi amaçlanmıştır.

### Gereç ve Yöntemler:

Araştırma evreni, klinik öncesi yıllardaki tüm lisans öğrencilerinden oluşmaktadır (Yıl 1-3,  $n = 144$ ). Araştırmaya katılmayı kabul eden ve ankete eksiksiz yanıt veren toplam 122 öğrenci (araştırma evreninin %85'i) analize dahil edilmiştir. Öğrencilerin öğrenme stillerini ortaya çıkarmak için Kolb'un öğrenme stili envanteri ve demografik özellikleri sorgulayan ek bir anket kullanılmıştır. Öğrenme stilleri ve bağımsız değişkenler arasında farklılık olup olmadığını araştırmak için ki-kare testi kullanılarak istatistiksel analiz yapılmıştır.

### Bulgular:

Öğrenme stillerinin dağılımında büyük çoğunluğu özümseyen (%44.3) ve değiştiren (%37.7) öğrenme stili gruplarının oluşturduğu saptandı. Öğrenme stili dağılımında yıllar arasında anlamlı bir farklılık olmadığı belirlendi ( $P < 0.05$ ). Öğrencilerin demografik özelliklerine (cinsiyet, lise mezuniyeti, diş hekimliğini isteği ile seçme, ikamet yeri, anne-baba eğitim durumu) ilişkin ankete göre, öğrenme stilleri ile incelenen değişkenler arasında istatistiksel olarak anlamlı bir fark bulunmamıştır. Literatürde sağlık alanını seçen öğrencilerin çoğunluğunun özümseyenler ve değiştirenler grubundan olduğu görülmektedir. Araştırma sonunda elde edilen bulgular öğrencilerin büyük çoğunluğunun benzer olduğunu göstermiştir.

### Sonuç:

Bu çalışma ülkemizde diş hekimliği öğrencilerinin öğrenme stillerini ortaya koymayı amaçlayan ilk çalışmadır. Bulgularımız literatürdeki çalışmalarla benzerlik göstermektedir. Sonuçlarımızı genellemek için daha büyük gruplarla daha fazla araştırmaya ihtiyaç vardır.

### Anahtar Sözcükler:

Öğrenme stili, Diş hekimliği öğrencisi, Klinik öncesi eğitim

## INTRODUCTION

The phenomenon of learning has attracted the attention of humanity throughout history. At the end of the 19th century, theories about learning began to be developed and rapid progress was made in this field (1). Educational theorist David Alan Kolb first described experiential learning in 1984 and afterward, he developed the Kolb's Learning Styles Inventory (Kolb-LSI) in order to determine the path that an individual follows to learn. Learning style can be defined as individual differences in the processes of perceiving information, processing and placing information in the mind (2,3). Individuals learn in different ways, and many learning style models and scales have been developed to identify learning styles. Kolb's Learning Styles Scale "Kolb Learning Style

Inventory (Kolb-LSI)" is the most frequently encountered scale in the medical education literature (4–6). Attention is drawn to the role of the characteristics of individual learning styles in the creation of the methods used in the learning process in modern education (7). Kolb's "experiential learning theory" defines learning as "the process of forming knowledge through experience". He states that individuals' learning ways can be different, and also individuals can use different learning ways together at the same time. He also emphasizes that individuals do not always learn in the same way (5,8). In the learning process, concrete experiences are transformed into concepts and these concepts are used to gain new experiences (9). Kolb states that learning takes place in four interrelated steps. According to these steps, individuals acquire some concrete experiences (learning by feeling) in the environment they live in and reflect these experiences by observing (learning by watching) in different situations. These reflective observations help the individual to make abstract conceptualizations (learning by thinking), to form principles and generalizations, and to use the generalizations they have acquired as a guide in their later activities and advanced learning (active experimentation, learning by doing) (5,10). Learning styles in Kolb's experiential learning theory; It is expressed as the components of four basic learning paths defined as concrete experience, reflective observation, abstract conceptualization and active experimentation. As shown in Figure 1, four quadrants are formed with angles between the continuums of processing (watching and doing) and perception (feeling and thinking). They are defined as accommodating, diverging, assimilating and converging learning styles.

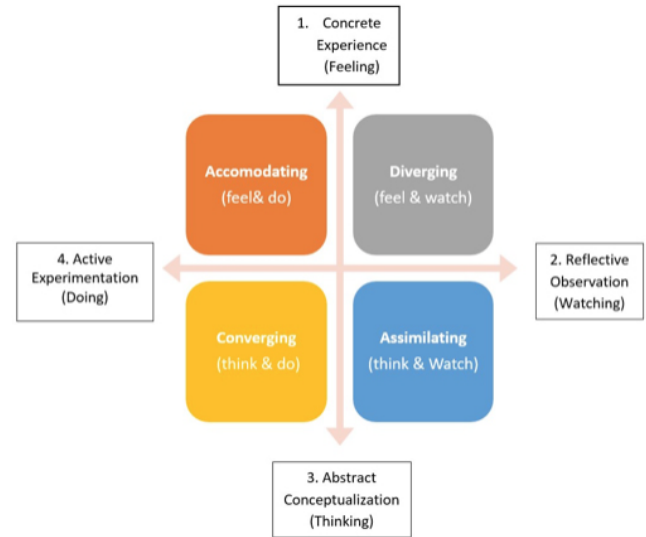


Figure 1. Kolb's experiential learning cycle and learning styles.

In order to achieve the desired learning outcomes in education, it will be beneficial to develop educational content and education models suitable for the target audience. Determining the learning styles of the students will contribute positively to the creation of appropriate education models. According

to our literature search, the learning styles of undergraduate dentistry students have not been studied yet. The aim of the study was to assess the learning styles of undergraduate dentistry students in preclinical years at Akdeniz University in Antalya, Turkey.

## MATERIALS and METHODS

The research population consists of all undergraduate students in preclinical years (Year 1 to 3,  $n = 144$ ). A total of 122 students (85% of the research population) who gave full answers to the questionnaire were determined and included in the analysis. Questionnaires with incomplete answers or errors were excluded (15%,  $n = 22$ ). To reveal the students' learning styles, Kolb's learning style inventory (Kolb-LSI) and another questionnaire for demographic characteristics were used. The independent variables of this study are age, gender, the high school graduated from, choosing dentistry by own will, place of residence and educational background of the father and mother of the participants. The students spent about 10 min in an ordinary lesson filling in the questionnaire. Statistical analysis was performed using the chi-square test was used to investigate whether any differences existed in the learning styles and the examined variables.

## RESULTS

According to the questionnaire of demographic characteristics, 52% of all participants are female, 59% graduated from science high schools accepting students having higher scores at a selection examination, and approximately 73% have parents not educated in a university (Tab. 1).

**Table 1.** Characteristics of the study group.

Sex			
Male		Female	
n	%	n	%
58	48	64	52
I graduated from			
Ordinary high school		Science high school	
50	41	72	59
Father's educational background			
High school or lower		University of higher	
79	64.8	43	35.2
Mother's educational background			
High school or lower		University of higher	
99	81.1	23	18.9

The distribution of learning styles was mainly assimilators (44.3%) and divergers (37.7%) groups. It was determined that there was no significant difference in learning style distribution among the years ( $P < 0.05$ ) (Tab. 2).

**Table 2.** Learning styles of the study group.

Learning Styles	Assimilator		Diverger		Converger		Accommodator		Total		Statistical Analysis	
	n	%	n	%	n	%	n	%	n	%	$\chi^2_{k.w}$ *	P
1 year	20	52.6	12	31.6	3	7.9	3	7.9	38	100	1.370	0.504
2 year	16	37.2	19	44.2	3	7.0	5	11.6	43	100		
3 year	18	43.9	15	36.6	4	9.8	4	9.8	41	100		
Total	54	44.3	46	37.7	10	8.2	12	9.8	122	100		

According to the questionnaire related to the demographic characteristics of the students, there was no statistically significant difference between learning styles and the examined variables.

## DISCUSSION

In the literature, some studies reveal that the students who choose health professions were assimilators and divergers (11). The findings obtained in our study showed that the great majority of the students were similar. On the other hand, in previous studies (4,6,12) conducted in our country, it was found that the learning styles of medical students were mostly converging and assimilating groups. In another study (13) at a medical school in South America, it was shown that 54% of students had an assimilating learning style and 23% had a converging learning style. In another study (14) conducted in Colombia in 2009, the learning style of first-year medical school students was similarly predominantly assimilating (47%) and converging (27%). Similar results were reported in other studies (15,16) conducted with medical school students. The educator-centered Turkish primary and secondary education system might also have influenced the learning styles of the students. In a study from Turkey, no statistically significant difference has been determined in the learning styles of medical school students studying in different curriculum models. However, there are studies show that the learning styles of students may differ over time depending on the context, environment, teaching method and the subject of the learning material (6,11). Since we designed our study as cross-sectional, we were not able to evaluate the change in learning styles of the participants in time. There are studies (14,15) in the literature that show that the learning styles of the students change as they progress through the vocational education process. Studies show that hands-on training can cause a shift to converging and accommodating learning styles.

In our study, there is no significant effect of gender on learning style was found. The effect of gender on learning style is controversial in the literature (4,14,17,18).

This study also plays a role in the first step of curriculum development (19). It is a part of the need analysis for the selection of a suitable teaching method. Future research is required to determine if the incorporation of these teaching methods results in a measurable improvement in the overall learning process.

## CONCLUSION

This study is the first study aiming to reveal the learning styles of dental students in our country. Our findings are similar to the studies in the literature. Larger population size research is needed to generalize our results.

**Ethics Committee Approval:**

The study was approved by the relevant institution administration.

**Author contribution statement:**

Concept - K.E., E.G.; Design – K.E., E.G.; Supervision – K.E., E.G.; Resources – A.K.; Materials - H.A., K.E.; Data Collection and/or Processing – K.E., E.G.; Analysis and/ or Interpretation – E.G., K.E., M.D.; Literature Search – M.D.; Writing Manuscript – M.D., K.E.; Critical Review – K.E., E.G.

**Informed Consent:**

Written informed consent was obtained from participants who participated in this study.

**Conflict of Interest:**

The authors declare that they have no conflict of interest.

**Financial Disclosure:**

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