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A latitudinal evaluation between the learning styles and modes of the students in interior architecture education and the YKS score types

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Abstract

The objective of this study is to investigate the relationship between the Higher Education Examination Score Types and Kolb Learning Styles of undergraduate students enrolled in the "Interior Architecture" and "Interior Architecture and Environmental Design" programmes, which accept students with diverse score types. In this context, a hypothesis was formed based on the difference between the score types and learning styles of students admitted to the Department of Interior Architecture with a numerical score type and students admitted to the Department of Interior Architecture and Environmental Design with an equal weight score type. A comparative relational survey model was selected to test the hypothesis. The study population consisted of foundation universities in Istanbul. In the 2021-2022 academic year, there were students enrolled in undergraduate programmes in interior architecture (and environmental design) at 34 foundation universities in Istanbul. The sample comprises 166 undergraduate students enrolled at Maltepe University's Department of Interior Architecture and Istanbul Gedik University's Department of Interior Architecture and Environmental Design. In the context of quantitative research, the convenience sampling method, one of the random sampling types, was employed to collect data. The Kolb Learning Style Inventory was employed to ascertain the learning styles of the students. The findings of this study indicate that there is no significant difference between the learning styles of students at Maltepe University and Istanbul Gedik University, thereby supporting the research hypothesis.

Keywords

Interior architecture education, Learning modes, Learning styles.

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1. Introduction

In architectural design education, the primary purpose of the design processes is to ensure the unity of theory through design activity (applications), and the result is the production of knowledge with the structural product. Similarly, in interior design education, it is assumed that the primary aim is to produce knowledge and abilities in the design process (Yuncu, 2008). For this reason, collecting data and correlating and interpreting it with analysis is necessary to design a space (Kaptan, 2016). "The courses that make up the program in space design education consist of practical courses that develop intellectual and conceptual abilities, enable the transfer of technical and theoretical knowledge, and use the theoretical and technical knowledge gained in the education process and based on learning by doing" (Basci & Koca, 2022, p. 99).

Much research has been done, and theories have been developed about lifelong education, which is necessary for our age. In the modern era, learning has gained meaning from behavioral and cognitive theorists (Orkun & Bayirli, 2019). Learning experience, on the other hand, is the change in the behavior of individuals that occurs relatively permanently as a result of experience (Ilhan, 2011).

Differences in the individual characteristics of students are also seen in their learning processes in the natural process. While the concept of individual difference motivates the professional work of educators on the one hand, it is a concept that is overlooked in practice on the other hand. Therefore, educational activities should consider individual differences (Ekici, 2013).

According to the traditional behavioral education model, individuals' learning processes are not considered. Over time, individual differences began to gain importance with the perspective that entered into cognitive understanding (Veznedaroglu & Ozgur, 2005).

The most important characteristic distinguishing human beings from other creatures is their ability to learn. Teaching and learning activities that nurture and develop this talent vary according to sub-disciplines and individual differences. The concept of learning style, created to examine this change, was introduced in New York St. John's University, Carbo, Kenneth Dunn, and with Rita Dunn, and has been one of the most emphasized and researched subjects, mainly in education (Markova & Powel, 2002; Eren, 2002, p. 7). The learning of people who look at issues from different perspectives, solve problems with different approaches, and use different processing styles (thinking) the data they obtain is also different (Ozden, 1998, p. 74). According to Mutlu (2005, p. 98), there are many reasons why learning style has gained importance in recent years. This reasons:

- Giving importance to individual differences,
- Revealing learning differences,
- Learning style concepts are emphasized in many studies,
- Being a versatile concept,
- It can be listed as the presence of many learning models in education.

Learning, a multifaceted concept, is a phenomenon based on individual differences. A literature review on the subject shows that researchers have developed many models that deal with learning styles since the beginning of learning styles research. Among these learning models, the Kolb Learning Style Inventory (KLSI) has been used to measure students' learning styles and modes in many fields and educational levels. According to Kolb, individuals learn from their own lives and experiences. In this direction, Experiential Learning Theory (ELT) forms the basis of the Kolb Learning Style. ELT defines learning as a process in which knowledge emerges due to experience transformation. Knowledge is formed due to the acquisition and transformation of experience (Kolb & Kolb, 2005, p. 2).

Interior Architecture undergraduate programs in Turkey with 'numerical score type' 'Mathematics-Science'; for Interior Architecture and Environmental Design undergraduate programs, students are accepted with 'equal weight score type' 'Turkish-Mathematics.' However, according to the limited literature that focuses on these two undergraduate programs comparatively, there is no difference among graduates (Eris & Agan, 2020, p. 438). The study

presents only two cases from the Departments of 'Interior Architecture' and 'Interior Architecture and Environmental Design'. Similarly, graduates of both programs receive the title of 'interior architect,' and it is seen that there is no difference between the two undergraduate programs in terms of professional competence. In this respect, it is essential to investigate the learning style, mode, and way of the students enrolled in these two undergraduate programs, which are parallel in the intersection of authority and competence, to understand the difference in score types.

It aims to examine the relationship between the Higher Education Institutions Examination (Yuksek Ogretim Kurumlari Sinavi-YKS) score types and learning styles of students enrolled in 'Interior Architecture' and 'Interior Architecture and Environmental Design' undergraduate programs, which accept students with different score types. This quantitative research is considered necessary in making the learning styles and modes of interior architecture (and environmental design) among students at different levels traceable and prioritizing new scientific studies that refer to the learning modes at the undergraduate level.

In this research, a hypothesis was established to test the relationship between the YKS score types and learning style and modes of the students studying in the Interior Architecture and Interior Architecture and Environmental Design Departments:

Research Hypothesis (H): There is no relationship between the score types of the Interior Architecture Department students placed in the university with the Mathematics-Science numerical score type and the Interior Architecture and Environmental Design Department students placed with the Turkish-Mathematics equal weight score type and Kolb Learning Style and Modes.

2. Interior architecture education and learning

2.1. Interior architecture education

Interior architecture, one of the professions of the 20th century, has been carried from the past to the present and is based on people's spatial usage habits (Kaptan, 2012). In other words, interior architecture is a design-based profession that uses scientific and technical data to create spaces with high comfort levels that will meet the desire and expectation of creating an aesthetic identity by responding to the customer's or user's functional requirements (Berdi Gokhan & Atasoy, 2005). The interior architecture reflects the culture it is in as a human action. It is an area of expertise not limited to choosing colors and materials but also covers business, communication, and management (Hernecheck et al., 1983).

The essence of the interior architecture profession is to produce a spatial response to the user demands, to provide comfort, and to create an atmosphere, which is one of the fundamental needs of the human being, and the need for shelter. In the design workshops, the aim of the project and what was wanted were given, and the students' works were developed in line with the critics and evaluated by the jury. This understanding of education is similar to today's interior architecture education (Pile, 2005). Although Deutscher Werkbund German Industry, founded in 1907, aims to gather artists and designers under one roof and raise the quality of education, it is known that it formed the foundations of the Bauhaus school. Bauhaus was founded in 1919 to combine art, craft, and architecture and become the school of intellectual and creativity. Education on method development in design with the design-science relationship has been effective (Cross, 2001).

With the innovations brought by the Industrial Revolution in the 20th century, the profession of interior architecture began to be recognized and to realize its first applications. Two different understandings of practice were reflected as the traditionalist attitude (represented by Elsie de Wolfe) as ornamentation with a decorative approach and the innovative attitude (expressed by Frank Lloyd Wright) affected by modernization in radical structuring (Ozsavas, 2011). Interior architecture education aims to provide the student with the profession's competencies and convey the necessary knowledge, abilities, and values for practice. Therefore, international organizations today de-

fine the professional competence of interior architecture education (Cavus & Kaptan, 2022a). For this purpose, the 1970s and later are seen as the turning point in which quality was considered in interior architecture education, and many accreditation institutions began to form (Ozsavas, 2011). In this sense, the Council for Interior Design Accreditation-CIDA is one of the accreditation institutions established to determine the qualifications of the interior architecture profession in the USA. The European Council of Interior Architects-ECIA is one of the common platforms where the European Union member states carry out their studies for professional qualifications in the field of interior architecture (Cavus & Kaptan, 2022b).

The school that started to give interior architecture profession education officially in our country is Mimar Sinan Fine Arts University with its current name, Sanayi-i Nefise Mektebi. Although it was opened as the Decoration (Ornamentation) Department by Osman Hamdi Bey in 1923, an interior architecture workshop was established in 1929. 4-year vocational training was given in the workshops (Ozsavas, 2011). In 1955, the 'Interior Architecture Department' was established by the decision of the Council of Ministers, and education began as a department in 1957 (Elmas, 2010). The 'interior architecture department' within the State School of Applied Fine Arts (Devlet Tatbiki Guzel Sanatlar Yuksekokulu), established in 1955, joined the body of Marmara University in 1982 with the higher education law and its current name. In 1985 there were three interior architecture departments (Eris & Agan, 2020). With the establishment of the Council of Higher Education (Yuksek Ogretim Kurulu [YOK]) (Kilic, 1999) in 1981, faculties began to be established within universities, and the number of schools providing interior architecture education began to increase. Now, interior architecture departments are within the faculties of many different state and foundation universities.

Currently, there are two education models available in Turkey: 'Interior Architecture' and 'Interior Architecture and Environmental Design'. According to the 2022 OSYM Quota Guide, a total of 84 universities (23 state, 53 foundation, 8 TRNC [Turkish Republic of Northern Cyprus]) offer 100 undergraduate programmes, including 46 (18 state, 21 foundation, 7 TRNC) in interior architecture and 54 (7 state, 43 foundation, 4 TRNC) in interior architecture and environmental design (Council of Higher Education Programme Atlas, 2023a; 2023b). The Interior Architecture and Interior Architecture and Environmental Design Departments are located within 12 different faculties.

Until 2017, programs that accepted students with equal weight, numerical, or talent exams. Now, only admit students with numerical and equal weight score types. According to the OSYM 2020 guide information, the 'Department of Interior Architecture' accepts students with numerical score types and the 'Department of Interior Architecture and Environmental Design' with equal-weight score types. In this case, students who want to study interior architecture are evaluated with mathematics and science knowledge and scores. In contrast, interior architecture and environmental design departments are assessed with Turkish and mathematics learning and scores (Council of Higher Education, n.d.). It is thought that the differences in faculty and score types need to be clarified for the requirements of the field (Erbay & Ulusoy, 2021). Interior design or interior architecture education is given in architecture, fine arts, or design faculties in Turkey and worldwide. There is flexibility in the training processes to adapt to the constantly evolving and changing content. Accreditation bodies continue to balance education quality and reduce the differences as much as possible (Ozsavas, 2011).

2.2. Learning and learning types

The concept of learning has been handled and defined with different approaches by many scientists, researchers, and educators from the past to the present. The concept, defined as "learning work" (Turk Dil Kurumu, 2022) with the meaning of the term, is the long-term permanent change

in the behavior and knowledge of the individual that occurs depending on the experiences expressed (Goldstein, 1994; Woolfolk, 1998; Terry, 2007; Ataman, 2009). The learning process, as an active process consisting of an individual constructing knowledge, understanding, and behavior regarding a particular phenomenon, event, or situation as a result of interaction with the environment, continues throughout the life in which people discover themselves (Charlesworth, 1996; Clements & Battista, 1990).

Learning is generally divided into the behaviorist, cognitivist, constructivist, and humanist learning model theories in the literature, and the definitions differ according to these theories. While learning from a behavioral point of view can be described as a permanent change in behaviors that can be observed at the end of the experience, learning from a cognitive perspective is changes seen in the mental structures of individuals (Selcuk, 2004, pp. 124-125). In the constructivist theory, learning is defined as active knowledge construction, while the humanist approach considers learning a function in personal development (Ozdemir, 2013, p. 37).

Pavlov, Tolman, Thorndike, and Skinner describe learning as "linking the stimulus and the behavior". Wertheimer, Kohler, Koffka, Bruner, and Ausubel define learning as "the product of both intelligence, motivation, and transfer". Miller, Dollard, and Piaget say that learning; They state that it "depends on the person's abilities, biological and cultural development, motivation, interest and the atmosphere of the learning environment" (Ataman, 2009, p. 219).

Today, learning is generally the product of life, defined as a permanent behavioral change. According to this definition, learning has three essential features (Erden & Akman, 1995, p. 120; Ulusoy, 2004, p. 140):

- As a result of learning, a behavior change occurs,
- Learning is the product of life,
- Learning is permanent.

In the learning processes of the individual interacting with environmental and individual factors, the way of thinking and performing learning tasks differs due to internal and external factors.

The learning styles concept was first introduced by Rita Dunn in 1960, and many definitions were made for individuals' tendencies and preferences for learning (Boydak, 2001, p. 3). Learning styles (cognitive styles) are generally regarded as information-processing habits and are a product of psychological research in personality, cognition, and perception (Shipman & Shipman, 1985).

According to Hunt (1979), learning style is the condition that facilitates learning. The way a student learns best is in its learning style. A student's cognitive, affective, and physiological structure, which affects perception, relations with others, and behavior in the learning environment, determines their learning style (Celik & Sahin, 2011, p. 24).

The concept of learning style, as proposed by Cornet (1983), encompasses both cognitive and affective domains. The former encompasses the processes of receiving, processing, storing, encoding, and decoding information, while the latter encompasses traits such as interests, focus of control, willingness to take risks, perseverance, motivation, responsibility, attention, and enjoyment of social life. Moreover, physiological (sensory perception, environmental qualities, need for food during work, and the period during the day during which optimum learning will take place) dimensions. Erden and Altun (2006) examine learning styles in five groups. They classified them according to their preference for receiving information, their choice for perceiving and processing data, their innate personality traits, the student's abilities, and the working conditions preferred by the students.

There is a wide variety of learning styles. Many researchers have definitions, learning/teaching styles, and style inventories. Many different researchers have led to the formation of various learning style models with their theories, methods, and focal points (Table 1).

Although many learning style models have been developed, a consensus

among theorists has yet to be established (Jarc, 1999); however, within the scope of this research, the learning style model put forward by David Kolb was used as one of the most well-known theories. While revealing the concept of learning style, Kolb created individuals' learning modes and learning ways together.

2.3. Kolb learning mode, style and its relation with interior architecture education

The 'experiential learning theory' put forward by Kolb (1984), who describes learning style as "individual choice methods in the process of receiving and processing information", is one of the most well-known theories about learning styles. The statement "learning is the result of already acquired experiences" constitutes the basic principle of the theory, and the view is based on the idea that individuals learn in different ways (Kolb, 2000). The learning style presented by Kolb is an extension of the experiential learning theory based on individual learning differences. In the Kolb Learning Style, known as the 'Experiential Learning Model' but also referred to as loop by Kolb, there are four different learning modes: concrete experience, reflective observation, abstract conceptualization, and active experimentation (Kurbanoglu & Akkoyunlu, 2008). The learning modes that Kolb defines can be seen in the Kolb learning cycle (Figure 1).

The model constituting the Kolb comprehension dimension has the concrete experience and abstract conceptualization at both ends of the vertical continuum; It shows the perceptual orientation of the individual on the environment and experiences. The cognition dimension is expressed in developing symbolic understandings of intuitive ways or experiences. Reflective observation and active experimentation show the transformation dimension in horizontal continuity. The transformation dimension refers to the preference for transforming and processing information (Jonassen & Grabowski, 1993, pp. 21-26; Kolb, 1984, p. 35).

Kolb (2017) stated that the learning ways that symbolize each learning mode differ. These are:

- By 'experiencing' for Concrete Experience,
- by 'reflecting' for Reflective Obser-

Table 1. *Definitions of learning styles made by various researchers (Veznedaroglu & Ozgur, 2005, p. 4).*

Researcher	Year	Definition
Reinert	1976	An individual's learning style is the style in which that person is programmed to learn most effectively to receive, understand, retain, and reuse new information.
Claxton and Ralston	1978	A learning style is a continuous, unchanging one that shows how a student responds to and uses stimuli during learning.
Dunn and Dunn	1978	Learning style is the component of at least eighteen items arranged according to four essential stimuli that relate to a person's (subject) assimilation and acquisition competence. These elements' combinations (formations) and variations indicate that very few people learn similarly.
Renzulli and Smith	1978	The learning style corresponds to the student's preferences for specific learning styles in the classroom, that is, the style they like to have different learning experiences.
Dell-Dora and Blanchard	1979	Learning style is the personally preferred way of absorbing information and experience in context-independent learning situations.
Hunt	1979	Learning style describes the educational conditions most conducive to facilitating a learner's learning. To say that a student is distinguished by their learning style is to say that some educational approaches are more productive for that student than others.
Keefe	1979	Learning styles are cognitive, affective, and psychological behavioral characteristics that learners use as invariant determinants of perception, interaction, and response in the learning environment.
Entwistle	1981	Learning style corresponds to the tendency to adopt a specific strategy.
Schmeck	1983	Learning style is the tendency of some students to adopt a specific learning strategy regardless of the particular demands of the learning task.
Kolb	1984	Learning styles can be considered as generalized differences in learning orientations based on the relative degree of the four learning process forms, as measured by a self-reported scale called the LSI.
Keefe	1987	Learning style is the whole of the cognitive, affective, and psychological characteristic factors that do not change, to some extent, how the learner perceives, interacts with, and responds to the learning environment.
Das	1988	Learning style is the tendency to adopt a specific learning strategy.
Felder and Silverman	1988	Learning styles are the characteristics and preferences of individuals in the process of receiving, holding, and processing information.
Patureau	1990	We can define a person's learning style as her unique learning style modeled on her cognitive style and their experiences in the learning-teaching situation.
Dunn and Dunn	1993	Learning style is how each learner receives and processes information that begins with concentrating on new and challenging information.
Jonassen and Graboeski	1993	Learning styles include the learner's preferences in different education and training activities. These are general trends favored in different processing of information.
Legendre	1993	Learning style: A variable, preferred style that a person likes when learning, solving problems, thinking, or simply reacting to an educational situation.

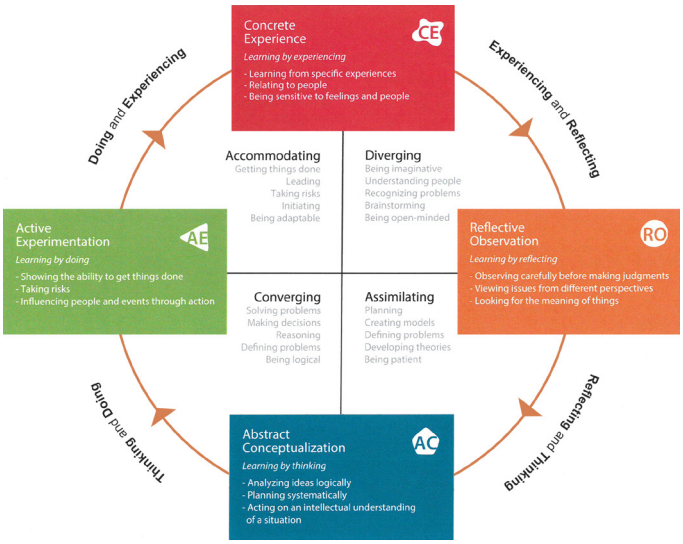

Figure 1. *Kolb learning cycle and relationship between learning modes and styles (Kolb, 2017, pp. 5-10).*

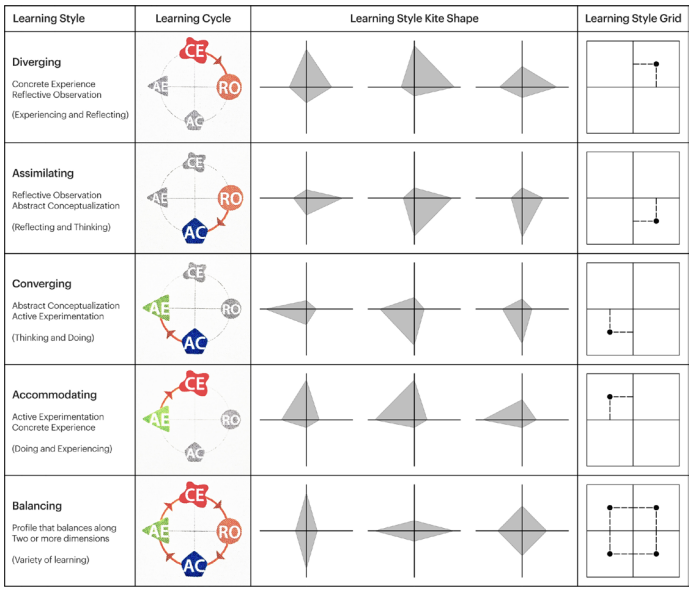

Figure 2. *Relationship between Kolb Learning Style, Mode, Kite Shape and Grid (Kolb, 2017, pp. 6-9).*

vation,
- by 'thinking' for Abstract Conceptualization,
- by 'doing' for Active Experimentation means learning.

An individual can have more than one of these learning styles. According to the Kolb learning model, the learning model of individuals is the component of four learning abilities. In this direction, Kolb (1984) distinguishes individuals according to the Converging, Diverging, Assimilating, and Accommodating learning styles (Askar & Akkoyunlu, 1993; Ekici, 2003; Stice, 1991) (Figure 2). One must regard which learning modes intersect to learn a person's learning style. The kite will be shaped according to these intersections, grid points, and learning paths will be determined.

However, only one of these four styles does not have to stand out in individuals. They can create a balanced profile with more than one option from the styles in the learning cycle. Existing research shows that some people learn through one or more of the 'balancing' styles, as seen in a few examples of the 'balanced style' in (Kolb, 2017, p. 6).

The importance of how learning takes place during the design process increases based on learning models (Ozdemir, 2016, p. 141). The academic performances of students in design education are significantly related to their learning styles (Kwan & Yunyan, 2005; Demirbas & Demirkan, 2003). Interior architecture education comprises theoretical courses and practical design studio/project courses. In these courses, the creative, conceptual, and design processes progress alongside the practice. Each student manages the process differently. The variation in students' learning styles during the design process is the reason for this situation. Understanding the learning styles of students and incorporating them into the design education process can have a positive impact on the design process by enhancing the interaction between students, project leaders, and executors. Tezel and Casakin (2010) conducted a study with interior architecture students to investigate the effects of learning styles on design performance using Kolb learning styles. The study concluded that considering individual differences contributes to the understanding of basic learning abilities and the development of individual skills and abilities. Ozdemir (2013) investigated the impact of students' personal characteristics on the design process and product. The study concluded that incorporating a learning style inventory in design studios would benefit both students and project coordinators.

At the point where the applied training is fed with theoretical knowledge, the knowledge of cultural, historical and social areas; the acquisition of the ability to have knowledge of ergonomics and anthropometry that affect human behaviour; the ability to solve and design the relationship between furniture form and construction; the knowledge of structural systems, circulation systems and building materials are also included in the discipline. The ability to present projects using different and up-to-date techniques of expression, the ethical and legal responsibilities of the profession, the ability to design with sustainability in mind, the ability to work and collaborate in an interdisciplinary way are the preliminary themes that exist in the learning processes of interior design education. Table 2 evaluates the relationship between Kolb's learning models and the learning outcomes of interior architecture education based on the learning

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Table 2. *The relationship between interior architecture education and Kolb learning styles.*

Interior Architecture Education Qualifications	Learning Style	Learning Mode	Learning Way
Gain the ability to have knowledge of ergonomics and anthropometry that affect human behavior.	Diverging	CE + RO	Experiencing + Reflecting
Gain the ability to analyse, synthesise, interpret and use this data in production between theory, design and practice.	Assimilating	RO + AC	Reflecting + Thinking
Gain producing creative, aesthetic solutions and critical thinking skills in the design and application process.	Converging	AC + AE	Thinking + Doing
Gain the ability to solve and design the form-construction relationships.	Accommodating	AE + CE	Doing + Experiencing

paths of 'thinking', 'doing', 'experiencing', and 'reflecting'.

3. Method

Ethical approval was obtained for this study, which required quantitative data collection from the participants. In addition, a Voluntary Information Form was sent to all participants to inform them about the purpose and scope of the study, how the data would be used and how confidentiality would be protected, and the Consent Form was signed.

Within the scope of the research, usage permissions were obtained from the license holder Korn Ferry Management Consultancy firm for The Kolb Learning Style Inventory (KLSI 3.1), which is used to determine the student's learning modes, styles, and ways.

Within the scope of the study, the quantitative research method was preferred, and the comparison-type relational survey model was used. In the comparative scanning model, since the researcher examines the natural environment, the results are likely suitable for real-life 'external validity' (Karasar, 2019, p. 118).

The convenience sampling method, one of the random sampling types, was preferred to collect data from the main population easily, quickly, and economically.

3.1. Population and sample

The population of this research is the students enrolled in Interior Architecture (and Environmental Design) undergraduate programmes of 34 Foundation Universities in Istanbul in the 2021-2022 academic year. The sample includes only two cases. Maltepe University (MAU) Faculty of Architecture and Design, Department of Interior Architecture and Istanbul Gedik University (IGUN) Faculty of Architecture and Design, Department of Interior Architecture and Environmental Design undergraduate students. Of the 166 participants, 67% (111) were female and 33% (55) were male. MAU Department of Interior Architecture accepted students with numerical score type and 48% (80 students) participated in the study. On the other hand, 52% (86% of the students) participated in the study in IGUN Interior Architecture and Environmental Design department, which accepts students with equal points.

3.2. Data collection tools

In the scope of the research, The Kolb Learning Style Inventory, developed by David Kolb in 1984 and revised in 2005, version 3.1 (KLSI 3.1) was used to determine students' learning styles and modes. The inventory, which aims to identify the four learning process forms, consists of twelve primary questions, with four secondary questions under each direct question. There is no time limit for KLSI, which can be completed in approximately thirty minutes. The scores obtained from the student's participation level in the related questions (minimum: 1-maximum: 4) were evaluated according to the scoring scale in the inventory.

3.3. Analysis of data

Whether the statistical data obtained within the scope of the research show normal distribution or not was tested with Kolmogorov-Smirnov and Shapiro-Wilks tests. The data obtained showed a normal distribution. Therefore, parametric tests were applied. Obtained data were analyzed with a 95% confidence interval and using the SPSS 21.0 package program.

The mean differences between the

Table 3. *Examination of the differences between Kolb learning modes of MAU and IGUN students.*

Kolb Learning Modes	University	N	x̄	sd	t	p
CE	MAU	80	29,70	5,42	-0,819	0,414
	IGUN	86	28,99	5,75		
AC	MAU	80	29,68	5,30	1,222	0,223
	IGUN	86	30,64	4,87		
AE	MAU	80	30,84	5,17	-0,071	0,943
	IGUN	86	30,78	5,38		
RO	MAU	80	29,79	4,65	-0,237	0,813
	IGUN	86	29,59	5,79		

Table 4. *Examination of the differences between Kolb learning modes of MAU and IGUN students according to classes.*

		CE Concrete Experience			AC Abstract Conceptualization			AE Active Experimentation			RO Reflective Observation		
Class	University	Average	ss	p	Average	ss	p	Average	ss	p	Average	ss	p
1 st Class	MAU	30,62	5,75	0,306	28,81	6,40	0,529	28,90	5,62	0,415	31,67	4,89	0,695
	IGUN	29,05	5,58		29,78	5,23		30,13	5,46		31,05	6,23	
2 st Class	MAU	29,00	6,93	0,952	27,14	7,10	0,034*	33,14	4,60	0,196	30,71	4,27	0,517
	IGUN	29,17	6,20		31,92	4,28		29,88	6,01		29,04	6,29	
3 st Class	MAU	29,00	4,90	0,735	30,00	4,23	0,537	32,35	5,30	0,747	28,65	3,87	0,511
	IGUN	28,33	5,15		31,00	3,61		33,00	4,53		27,67	3,46	
4 st Class	MAU	29,76	5,37	0,663	30,66	4,68	0,982	30,48	4,50	0,096	29,10	4,88	0,281
	IGUN	28,92	6,42		30,69	5,41		32,92	3,73		27,46	3,45	

learning styles of MAU and IGUN students and the comparisons of these differences by gender were analyzed by independent groups t-test. Tukey test was conducted to understand which age groups were influential in forming significant differences.

4. Results and findings

This study hypothesized to investigate the relationship between Higher Education Examination (YKS) score types and learning modes of students enrolled in 'Interior Architecture' and 'Interior Architecture and Environmental Design' undergraduate programs, which accept students with different scores. In this context, the hypothesis was established based on "the relation between the score types and learning modes of the Interior Architecture Department students placed in the university with numerical score type and the Interior Architecture and Environmental Design Department students placed with the equal weight score type. In order to test this hypothesis, the 'comparative relational screening model' was preferred.

The scientific approach employed to address the research problem has yielded findings pertaining to the factual data obtained through the use of KLSI version 3.1. In this context, the mean differences between the Kolb learning modes of MAU and IGUN students according to universities were analysed through the use of independent groups t-tests. According to the data obtained; there are numerical differences in favour of MAU in the learning mode averages of CE (29,70>28,99), AE (30,84>30,78) and RO (29,79>29,59); and in favour of IGUN in the learning mode averages of AC (29,68<30,64). Conversely, no statistically significant difference ($p>0.05$) was observed in the learning mode averages of CE ($p=0.414$), AC ($p=0.223$), AE ($p=0.943$) and RO ($p=0.813$) (Table 3). In this context, the first finding of research is that there is no meaningful difference between the learning modes of MAU and IGUN students. This result supported the research hypothesis of the study.

The mean differences between the Kolb learning modes of MAU and IGUN students according to the classes were analysed by independent groups t-test. The data obtained indicated a significant difference between the AC learning mode averages of IGUN and MAU students ($p<0.05$). The mean AC learning mode of IGUN second-grade students is significantly higher than that of MAU second-grade students ($p=0.034$). While there are numerical differences in the averages of other grade levels, these differences are not statistically significant (Table 4). There is no research in the literature that directly examines this difference. In this context, one of the unexpected findings of the research is that there is a meaningful difference between the AC learning mode averages of MAU and IGUN second-year students.

On the other hand, a large number of studies in the literature show no significant relation between gender and learning modes. The results of the meta-analysis study conducted by Severiens and Ten Dam (1994) on the relation between gender and learning styles showed no meaningful

difference on the deep approach scale. Previous studies on Learning Style Inventory tests also found that males are more abstract (AC) than females in the perception dimension (AC-CE); the processing dimension (AE-RO) shows that there is no significant gender difference (Smith & Kolb, 1996). On the other hand, in the first of Knight et al.'s (1997) three studies, boys primarily defined their learning style as experiencing (CE) rather than thinking (AC). However, in the second and third studies of the same survey, no significant relation was found between gender and learning style. Similarly, Demirbas and Demirkan's (2007) research on the relation between learning styles and gender of design students shows that learning styles and gender are independent in perception and processing.

In this context, the mean differences between the Kolb learning modes of MAU and IGUN students according to gender were analysed by independent samples t test. According to the data obtained; there are numerical differences in favour of female students in CE (29,76>28,47) and RO (30,08>28,89) learning mode averages; in favour of male students in AC (29,82<30,89) and AE (30,34<31,75) learning mode averages. Conversely, no statistically significant difference (p>0.05) was observed in the learning mode averages of CE (p=0.164), AC (p=0.203), AE (p=0.106) and RO (p=0.170) (Table 5). This finding provide empirical support for the limited existing literature on the relationship between learning style and gender.

As part of the research AC, CE, AE, and RO scores were used to determine learning styles, which are four learning modes, and binary combination scores (AC-CE and AE-RO) were obtained to determine learning styles. The scores obtained from the AC-CE process and marked on the vertical dimension of the grid show how the students gained experience. The scores obtained from the AE-RO process and marked in the horizontal dimension of the grid express how the students coped with the experience. In this direction, data points related to learning style distributions of MAU and IGUN students were analyzed on the grid. According to the

Table 5. *The relationship between Kolb learning modes and gender of MAU and IGUN students.*

Kolb Learning Modes	Female		Male		p
	x̄	sd	x̄	sd	
CE	29,76	5,87	28,47	4,90	0,164
AC	29,82	5,19	30,89	4,85	0,203
AE	30,34	5,33	31,75	5,05	0,106
RO	30,08	5,44	28,89	4,83	0,170

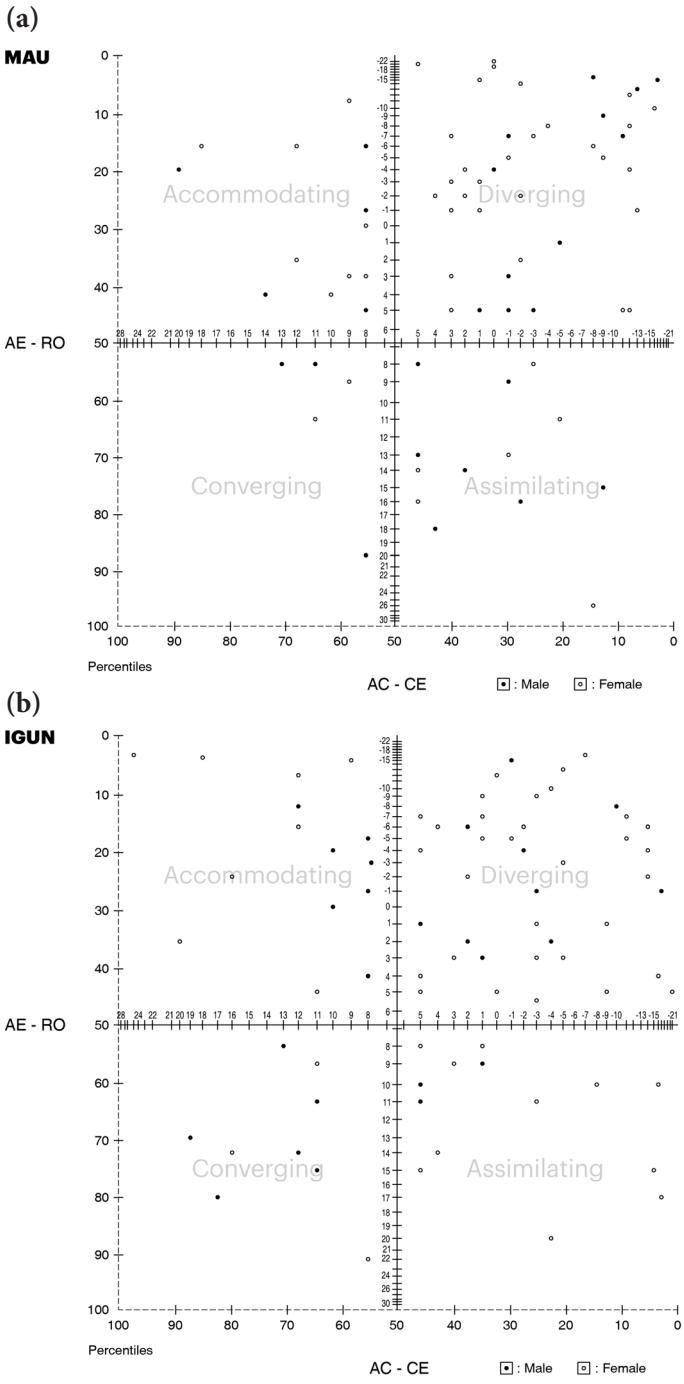

Figure 3. ***(a)*** *Students' Kolb learning style point distribution MAU.* ***(b)*** *Students' Kolb learning style point distribution IGUN.*

data obtained, of MAU students, 55% (32 female, 12 male) Diverging, 17.5% (9 female, 5 male) Accommodating, 17.5% (7 female, 7 male) Assimilating, 10% (5 female, 3 male) Converging; Of the IGUN students, 52.3% (34 female, 11 male) Diverging, 18.6% (13 female, 3 male) Assimilating, 17.4% (8 female, 7 male) Accommodating, 11% .6 (3 females, 7 males) have Converging Learning Style (Figure 3a-b).

In this context, the second findings obtained from this study is that there is no meaningful difference between the learning styles of MAU and IGUN students. According to the results of Demirbas and Demirkan's (2007) research on the relation between learning style and academic achievement, 40.5% of the 111 students who received design education were Converging, 34.2% Assimilating, 15.3% Diverging, 9.9 of them have Accommodating style. Ayalp et al. (2015) found that 51.6% of the participants were assimilating, 24.7% were converging, 13.8% were diverging, and 10% were accommodating styles in a study of 442 students aimed at identifying the learning styles of first-year students studying architecture. Similarly, According to the results of the research conducted by Kolsal and Kandemir (2021) on the intersection of learning styles and academic achievement, 76.4% of the 17 students who received design education had Converging, 17.6% Assimilating and 6% Accommodating learning style. No student was identified in the diverging learning style. In this context, research in the literature shows that students who receive design education mainly have a Converging Learning Style. Contrary to the results in the literature, the findings obtained from this study indicate that both MAU and IGUN students have the most Diverging and minor Converging learning styles. Therefore, this outcome from the study differs from the results in the literature.

5. Conclusions and recommendations

The research conducted revealed no statistically significant differences in Kolb learning modes (CE, AC, AE, RO) and Kolb learning styles (Diverging, Assimilating, Converging, Accommodating) between MAU and IGUN students. This result supports the hypothesis by indicating that the type of YKS score used for university admission (numerical for the Interior Architecture program and equal-weighted for the Interior Architecture and Environmental Design program) does not significantly impact students' learning modes and styles. According to this finding, students' learning modes and styles are more likely shaped by individual characteristics and personal preferences.

Learning modes did not show significant differences between universities, but an exception was found in the AC learning mode for second-year students. IGUN students had significantly higher AC scores compared to MAU students. This suggests that second-year students at IGUN may be developing abstract thinking and conceptualization skills more effectively, or these skills may become more pronounced during this period. However, further research is necessary to understand the underlying causes of this difference.

This study contradicts the existing literature that predominantly identifies the Converging learning style among design students, finding that the majority of both MAU and IGUN students exhibit a Diverging learning style. This deviation from the norm indicates a change in educational dynamics or shifts in student populations. Those with a Diverging learning style are characterized by their ability to view situations from multiple perspectives and perform well in brainstorming scenarios that require avoiding conventional solutions. This supports the idea that both Interior Architecture and Interior Architecture and Environmental Design students demonstrate more creative and innovative approaches in their learning processes and suggests that current educational environments encourage flexible thinking skills. This finding is an important consideration in the design of Interior Architecture (and Environmental Design) education programs. Educators should develop methods that maximize students' creativity and innovation potential by considering their individual learning styles.

The study also examined gender differences in learning modes, and the results showed that female students tended to focus more on CE and RO learning modes, while male students concentrated on AC and AE learning modes. However, despite numerical differences between the two groups, no statistically significant difference was found. This finding aligns with some of the existing literature, suggesting that while gender does not have a decisive impact on learning modes, certain tendencies may still be observed.

The hypothesis established within the scope of this quantitative study was tested on the Kolb Learning Style Inventory. In addition, it provides an idea about the relation between the score types and learning styles of the Interior Architecture Department students placed in the university with the numerical score type and the Interior Architecture and Environmental Design Department students with the equal weight score type. On the other hand, one of this study's most essential methodological limitations is that the research was limited to the 2021-2022 academic year, and the quantitative data were collected from only two foundation university students. The fact that the study group was selected from a limited area weakens the possibility of generalization of the findings and negatively affects the external validity of the research. In this context, to eliminate the problem of low external validity and to represent the study population of the data obtained from the research, It is recommended to plan new studies that include interior architecture (and environmental design) students studying at different universities.

In conclusion, this study demonstrates that YKS score types do not have a direct impact on students' learning styles and modes, but individual learning styles play a significant role in the educational process. In this context, educational programs need to be designed with more flexibility and consideration of individual differences. Future studies are expected to support these findings and contribute to the development of more effective teaching strategies in both Interior Architecture and Interior Architecture and Environmental Design education. On the other hand, in many studies in the literature, it is suggested that preferred learning styles are generally a reflection of a tendency rather than a specific style, and therefore, there may be a possible change in learning style according to different situations (Busato et al., 1998; Duff, 1997; Marriott, 2002; Pinto et al., 1994). Therefore, future studies can examine the change in learning styles of design students in the following years and their professional lives. In addition, a comparison between different countries will attract the attention of academics working in this field.

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