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## Effect of Blended Learning on Students' Products of Design of Interior Space

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**Abstract**— Many technological innovations have appeared in recent times one of them is e-Learning, which has become popular in Higher Education in covid-19 pandemic as one of the most efficient ways in the whole world including Iraq. The aim of this research is to investigate the effect of Blended Learning on the students' products of the design of interior space by answering the following questions: What is the appropriate learning process in the subject of Interior Design? How can blended learning enhance students' production level of interior spaces? Blended learning is the integration of learning methods and strategies with various means through the employment of traditional education tools and methods with e-learning tools and their proper employment according to the requirements of the educational situation. Using blended learning increases learning experiences by integrating classroom education and e-learning. It also helps develop skills and theoretical knowledge by improving learning outcomes which allow for increasing the number of enrolled learners and relieving pressure on the teachers to facilitate access to the educational material. This provides an effective method of communication with students. In this paper, descriptive analysis was used as the data was collected by first, reviewing the literature of both learning styles in Higher Education which are the Electronic and Traditional learning of designing interior space. Second, study cases of Real Classroom/Traditional, Virtual Classrooms and the blending of them to study the design of interior space. This study covered the academic years (2019-2021) and involved (115) students in the Fourth Stage, Department of Architectural Engineering, College of Engineering, University of Baghdad/Iraq. Third, a checklist on Google Forms was used and then the data was analyzed through (SPSS) program. The result of the analysis has shown the importance of the curriculum as it helps achieve inclusiveness of the vocabulary of the language of internal spaces through. Show the ability to criticize and analyze for understanding the language of interior spaces. It is an addition to technological processes such as exaggeration in the relationship between the vocabularies of interior spaces, for example, the relationship of color to light; the flexibility to meet the needs of the language of internal spaces. On another side, the analysis illustrates the importance of skills through capacity training in using the hardware and applications of interior space design programs. Mastering, flexibility in implementing educational programs that help in preparing the design of interior spaces, for example, using programs to show color, light, and texture. Besides, the time and speed such as understanding programs related to designing elements of interior spaces, and time freedom commitment such as application time. Therefore, this study concludes that integrated Face to face Learning and E-Learning have significant effects on student products for a better understanding of Architectural Studies in general and the design of interior space especially.

**Keywords**— Blended learning, adaptive learning, design of interior space, architectural study, Iraq.

## 1. Introduction

In the last decade, information and communication technologies (ICT) have been increased the goal was to make the learner focus on, first the educational process instead of the teacher and second to focus on active learning and cooperative learning strategies. E-Learning is among these innovations which uses all kinds of technologies in the delivery of information to the learner with less time and effort and more benefit. This learning may be immediate, synchronous learning, and it may be asynchronous, inside or outside the classroom, lifelong learning, and training. E-learning integration with face-to-face learning will keep growing as an indispensable part of academic and professional education.

Efforts should continue to explore how to create more appealing and effective online learning environments. One way to achieve this is to integrate appropriate methods, enhance system interactivity and personalization, and to better engage learners [25]. The response to this is by enhancing the standards of specialist instruction of (Traditional Learning) through the usage of new information and communication technology in the instructional process; i.e. to use new teaching approaches and expand the innovative and intellectual elements of educational practices; so that various forms of these educational activities could be combined to adapt information teaching technologies to students' individual characteristics guaranteeing continuity and connection in education and training; and the development of IT software [17].

From one side the principles of joint creativity in design by setting up a laboratory for the development and discussion of two conflicting axes: the axis of unlimited creativity in design and the axis of specific, closed, and strict development according to the principles of specialists. They reach the highest level of understanding of the complex design processes in contemporary design through criticism with participants, then research and thinking, then multiple iterations, then first presentation, and finally evaluation, and follow the educational method as a method of educational design research to immerse themselves in real-life problems with the design. During the discussion, criticism, and collaborative work [19].

On the other side, it adopts a pattern of rethinking the origins of the science of teaching by departing from the traditional method to another pattern and discovering new possibilities in how to teach the curriculum of designing interior spaces through the experience of presenting a graduation project via virtual reality on the Internet. Virtual is an alternative method due to the Covid-19 pandemic and for a wider audience of different cultures all over the world who can watch it. An intensive course was prepared with an educational experience and recorded as one of its requirements, to allow learners to present their design proposals by presentation in the form of digital slides or animation, voice narration, films, and sounds with

each other and with their own drawings to express their design ideas and through the supervision of the authors, viewing, changing, modifying and coordinating the presentations, the results were to achieve the main goal of the possibility of using virtual reality on the Internet as an alternative, interesting and effective method for learners, despite the belief of many teachers that the virtual method reduces the quality of education [11]. Thus, the principles and standards of contemporary study can apply in the design of interior space by a combination of different processes of learning such as Blended Learning linked to virtual and reality learning.

Whitehead et al. (2021) investigated how the COVID-19 pandemic has affected design education in the UK, particularly in terms of blended learning by analyzing three product design courses. The authors assess the suitability of course materials and online teaching methods, as well as their impact on a student's motivation and learning outcomes. The authors suggested that a balance between online and offline teaching is necessary to maintain the quality of design outputs and cultivate the necessary skills for professional practices. Also, they highlighted the importance of physical studio space and in-person experimentation and recommend the development of learning technologies to compensate for their loss of them [22]. However, the researchers highlighted the effect of design education by blended learning and they did not mention its effect on architectural studies linked to students' products on the design of interior space.

Teuku and Rasyimah (2021) evaluated the impacts of COVID-19 on architectural design education, specifically on the performance of sophomore students taking architectural design studios at Malikussaleh University in Indonesia. The study found that online learning was more challenging than direct classes, and managing assignments were easier in terms of submission but harder in terms of consultation [18]. This study mentioned challenging E-learning compared with traditional ones as different learning styles in general. However, it ignored the effect of blended learning on architectural studies linked to the design of interior space. Peimani and Kamalipour (2022) discussed the challenges and opportunities of delivering a postgraduate urban design studio subject at Cardiff University during the COVID-19 pandemic. The study focused on the experience and perception of students in relation to blended learning and teaching, and provide insights into the effective design and delivery of urban design studio education incorporating a mix of face-to-face and online modes of delivery [13]. However, they took blended learning in a postgraduate studio instead of taking it through undergraduate studios such as a design of interior space.

The authors such as Dabaghi and Silia (2022) highlighted the benefits of blended learning, which combines physical and virtual delivery modes for teaching architecture design studios. They found that while theoretical aspects can be

effectively taught online, practical skills that require tactile abilities were best taught in person. Also, they identified types of interactions that can maximize the potential of technology-enhanced learning in the context of the foundation studio [7]. This research paper did blended learning which combined physical and virtual study in architectural design studios in general, rather than the design of interior space in Iraq.

Alburgawi and Al-Gamdi (2022), illustrated the impact of the COVID-19 pandemic on architectural education during the Saudi lockdown, as well as the new normal that has emerged was determined. This suggested that the potential for developing frameworks and strategies for adapting architectural pedagogy models to unexpected situations demonstrates the feasibility of conducting part of the design course remotely and the rest on campus in order to maximize effectiveness and produce quality architectural designs with maximum detail. However, the research shows that both students and educators need to be more aware of the self-learning process. The research value lies in investigating how the imposition of a distance architecture design studio as a result of the COVID-19 lockdown has potentially established a new pedagogical model for teaching architecture design studios [3]. However, this study adapted e-learning in the architecture design studio, it did not adopt blended learning in the design of interior space related to student products.

Megahed and Hassan (2022) examined the effects of the COVID-19 pandemic on architectural education (AE), with a focus on the interaction and integration of technology-based models. The study proposed a theoretical framework for investigating blended learning approaches in AE, which is based on the blended teaching-learning continuum, the growth of online delivery models and technology integration, and the gradual acceptance of responsibility for the current COVID-19 pandemic. The study proposes a vision for reimagining post-COVID-19 education, as well as the necessary BL strategy to provide a theoretical framework that integrated the instructional models that instructors must investigate. The research findings were based on a theoretical approach that has not been tested in practice, in which a more thorough investigation is required. As a result, the road to reimagining post-COVID-19 AE is still in progress [12]. However, this paper focuses on integration of blended learning in architectural education, it did not take into consideration the effect of this type of learning on the student outcome in design of interior space. Afcana (2018) looked at the direct and indirect effects of a mixed learning environment on the link between overall course satisfaction and student performance in the setting of interior architecture [24]. Thus, research focused on interior architecture rather than the products of Design of interior space. The same author (2016) investigates how blended learning might improve interior design students' learning outcomes, engagement with non-studio courses, and learning successes through learning experiences in five areas: course design, learning materials, and electronic course environment; beside student-instructor interaction; peer-to-peer interaction; individual learning process; and

course results [23]. However, this could be parallel with the current research that had different methods and research setting.

So, in this paper we will investigate the effectiveness of blended learning on the students' products of the design of interior space in Baghdad, doing it in the following sequence: start with blended learning in higher education, the design of interior space subject, the research methodology, the result and the conclusion in the end.

### 1.1 Blended Learning in Higher Education

Education represents the main pillar in the advancement of people therefore, nations strive to develop their education and look after learning in general. They depend in many educational stages on classic education in which the greatest burden falls on the teacher and the role of the learner is largely negative. So many institutions seek to develop education by finding new methods and styles of learning that are active and positive and make the teacher a guide. Blended learning is the integration of learning methods and strategies with various means... This integration is through the employment of traditional education tools and e-learning tools methods and their proper employment in accordance with the requirements of the educational situation. [10]

The styles of learning in Higher Education can be grouped into six different types in which teachers' roles, spatial space, delivery method, and study schedules can be included. Any new pattern can be incorporated into any of these styles. This group includes (1) Face-to-face Driver, (2) Rotation, (3) Flex, (4) Online lab, (5) Self-blend, (6) Online driver [16]. Even though, rotation, flex, and self-blend can be under both (Face to face & E-Learning. When a component such as computerization appears in the Higher Educational Process which is ICT the E-Learning can be supported or not in Higher Education. Therefore, this section focuses on defining the meaning of Blended Learning which includes:

- Face to face Learning (Traditional Learning (
- E-Learning can be effective as conventional Classroom Learning under certain situations; however, it can replace classic classroom learning .

ICT relies on interconnected intensive instruction in all aspects of learning activities and learning behavior which is the main thing in teaching information and communication technology. The functionality of learning is provided by ICT, so the student asks, confirms his thinking, prompts action, and expresses doubts about norms in the course of these updates. At the same time, it is ensured that the situation is novel through new discussion subjects. Learning is mostly a socio-cognitive activity that should not only affect students' thinking but also their sentiments and emotions to bring a positive feeling. Some students feel bored or intimidated in front of a computer. Other important issues in E-learning must also be taken into consideration. Issues of trust, authorization,

confidentiality, and individual responsibility must be resolved. Owners of intellectual property should be properly compensated [14]. Learning becomes interactive, and interesting and increases the importance of student's independent work, while the intensity of educational processes is increased significantly. Any professor can have an extraordinary attitude toward organizing the education process for it means the possibility of creating conditions for individual student self-study, developing student information and communication skills, cognitive activities, independent collecting work, processing, and analysis of results; motivation for cognitive autonomy. One of its benefits is the increase in the quality of education through new activities, an interest in working with a computer, and the use of information and communication technology in educational activities.

The use of ICT in class significantly increases its effectiveness and speeds the lesson preparation, allows a teacher to show his creativity in full, provides clarity, attracts a large amount of didactic material, and increases the workload performed in the course by up to 1.5-2 times. The information received by the human visual sensory organ is known to be received most effectively during the exchange of information and leaves a deep imprint on the memory. The information provided by voice in particular has a positive impact. E-Learning facilitates the translation of ideas and enables the students to build competencies in accordance with their level of education, intellectual capabilities, and interests [17]. The responsibilities of E-Learning are updated. Teachers are constantly using the technologies of information and communication. The key directions for the use of computer technology in classrooms can be highlighted as visual (image, image), demo (exercises, tables, concept, and others), simulators, monitoring the skills and achievements of apprentices, and internet work (training and development programs). Ability to use and present different electronic resources which support and supplement the staff for the education process in which teachers use electronic resources such as class lectures, logic games, and shell testing. Internet Resources /information technology at every stage can be anchorage, repetition, generalization, monitoring, physical minutes, and extracurricular activities such as explaining new materials and making a more interesting, varied, and intense learning process. ICTs were used in education through the fact that modern computers enable text, graphics, audio, animation, video clips, high-quality photographs & large enough video full-screen volumes. ICTs train students in their specific skills such as attention, memory, thinking, etc.

Continuous learning as a universal form of activity establishes a single educational area for information, actively adopts new teaching tools & methods aimed at using information technology, and develops a system of advanced education. The multimedia format presents information materials (illustrations, videos, audio recordings, presentations, and so on), and organizes project activities using ICTs to enable the creation of

conditions for independent research and the development of skills for independent creative activity [21]. In contrast, security on the internet is a growing challenge primarily due to the open access by the public to this universal network. In addition, since multimedia materials are heavily used in E-learning systems, a high-bandwidth network is a basic requirement for efficient content access. To ensure the modern quality of education based on the maintenance of its fundamental nature and on the fulfillment of the individual, society, and state's current and future needs [25].

Increased motivation for learning for increased cognitive interest, an evaluation of the student's learning activities identifying the problems of their own learning activities, and training for student cognitive independence. The application of information technologies in the student's work is very effective to lead lessons with students in a modern digital communication environment in order to speed up the process of computerizing society and education. The use of digital teaching and learning tools involves E-learning. It uses technological instruments to enable students to study everywhere and anytime. Training, knowledge delivery, and feedback are included. It encourages students to interact, exchange views and respect different viewpoints. It facilitates communication and enhances learning relationships [21].

However, Classic / Face-to-face and E-Learning lessons, together with multimedia presentations, tests, and software products allow students to deepen their knowledge which was gained before not only by forced imagination pushing the study area apart but through the use of state-of-the-art technology to dive into a bright, colorful and vibrant world. Therefore, the current paper identifies Blended Learning which is the use of technological innovations in the combination of goals, content, learning resources & activities, and methods of communicating information through Classic / Face-to-face Learning, and E-Learning, to enhance knowledge and create interaction between teachers and students. One question appears here, is blended learning appropriate for architectural study in general?

## 1.2 The design of interior space

The subject of design of Interior space dealt with space which is the main course in the 3rd or 4th stage of the architectural study. It is used by architects who design the features and characteristics of such spaces through shapes and scales. The two dimensions respond to requirements or functions, while the third dimension provides a way to understand other issues [6]. Interior space is classified into interior architecture [9], interior design, & interior decoration [5]. To start designing an interior space project you need to understand its elements. These elements were highlighted by Al-Akkam et al and Agha [4-1] through the following items :

-The physical elements are identified and determined through: 1) Vertical elements such as walls, portions, and columns 2) Horizontal elements such as ceiling and roof 3) Transition space such as satires and ramps, doors and windows 4) Materials 5) Furniture and furnishing .

-The visual elements, these types of elements that had a psychological and visual effect which include: 1) The form, 2) Lighting, 3) Color, 4) Texture, 5) The fourth diminution.

Here comes, how blended learning affect students protects in the design of interior space could. Therefore, we need a case study.

## 2. The Methodology

The researchers used the descriptive approach as it is more appropriate to achieve the goal of the current study which is to investigate the effect of Blended Learning upon the students' products of the design of interior space by answering the following questions :

- Q1 What is the appropriate learning process in the design of interior space ?
- Q2 How can Blended Learning enhance the level of students' products of the design of interior space?

The data collection was determined by three methods :

- First: Literature review, by knowing what is available information that dealt with learning in Higher

Education through patterns, constituents, and characteristics as well as the material design of interior spaces elements according to the vocabulary of the subject curriculum .

•Second, teachers' experience in gathering information and obtaining some indicators through perusal by the subject's lecturers on the outcome of students' projects in the subject of designing interior spaces, identifying the differences between them and the results of previous three years in different types of learning. Figure (1) show some examples of students' projects .

•Third, pilot study, a preliminary questionnaire distributed to (9) students through the exploratory experience that included the following two questions:

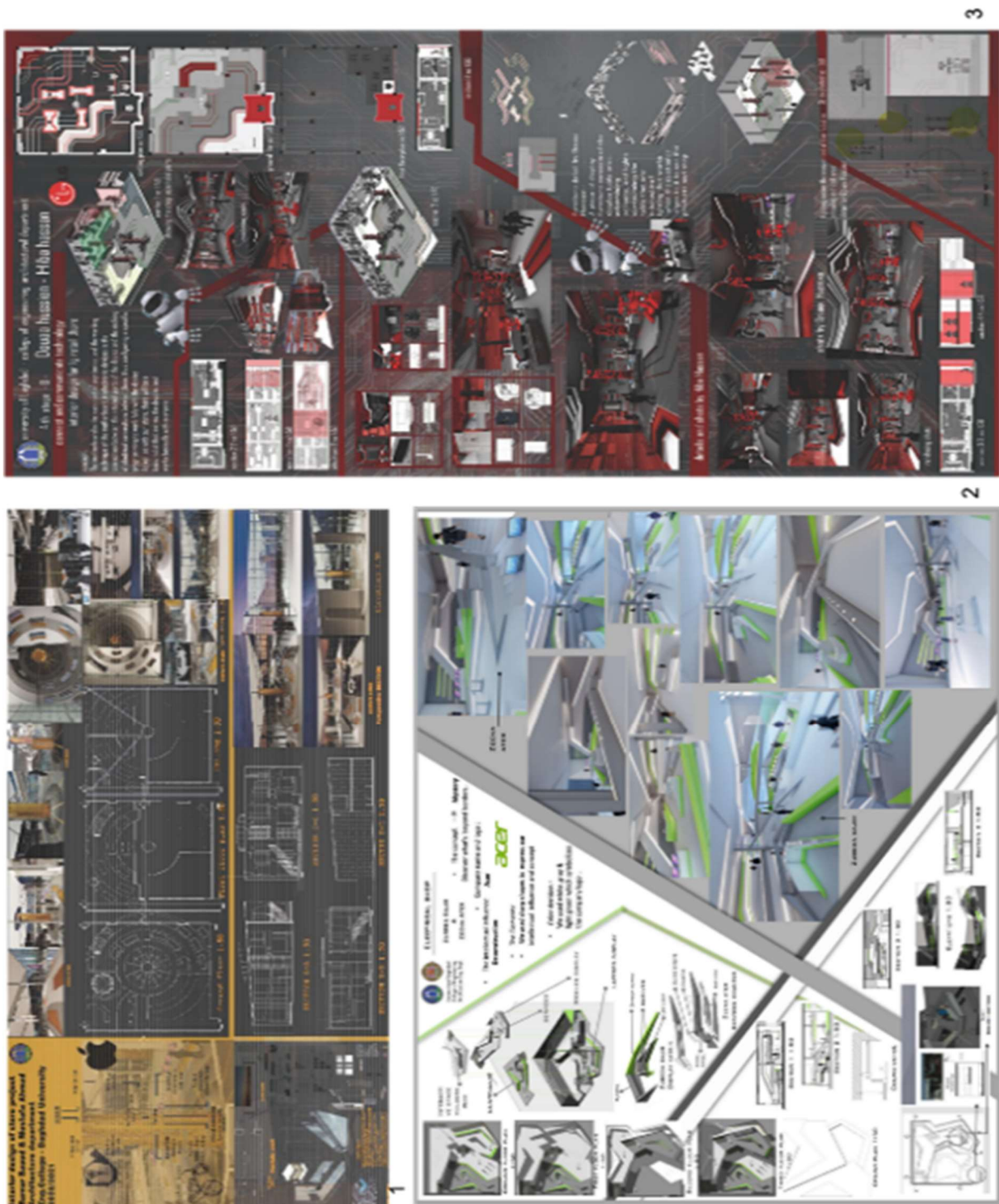
-Does blended learning have an effect on the subject of interior space design?

-If (yes)• What are the negative & positive effects of Blended Learning on the designing of interior spaces ?

Three types of data collection help develop the Blended Learning Criteria, clarifying the designing elements of interior space and forming relations among them.

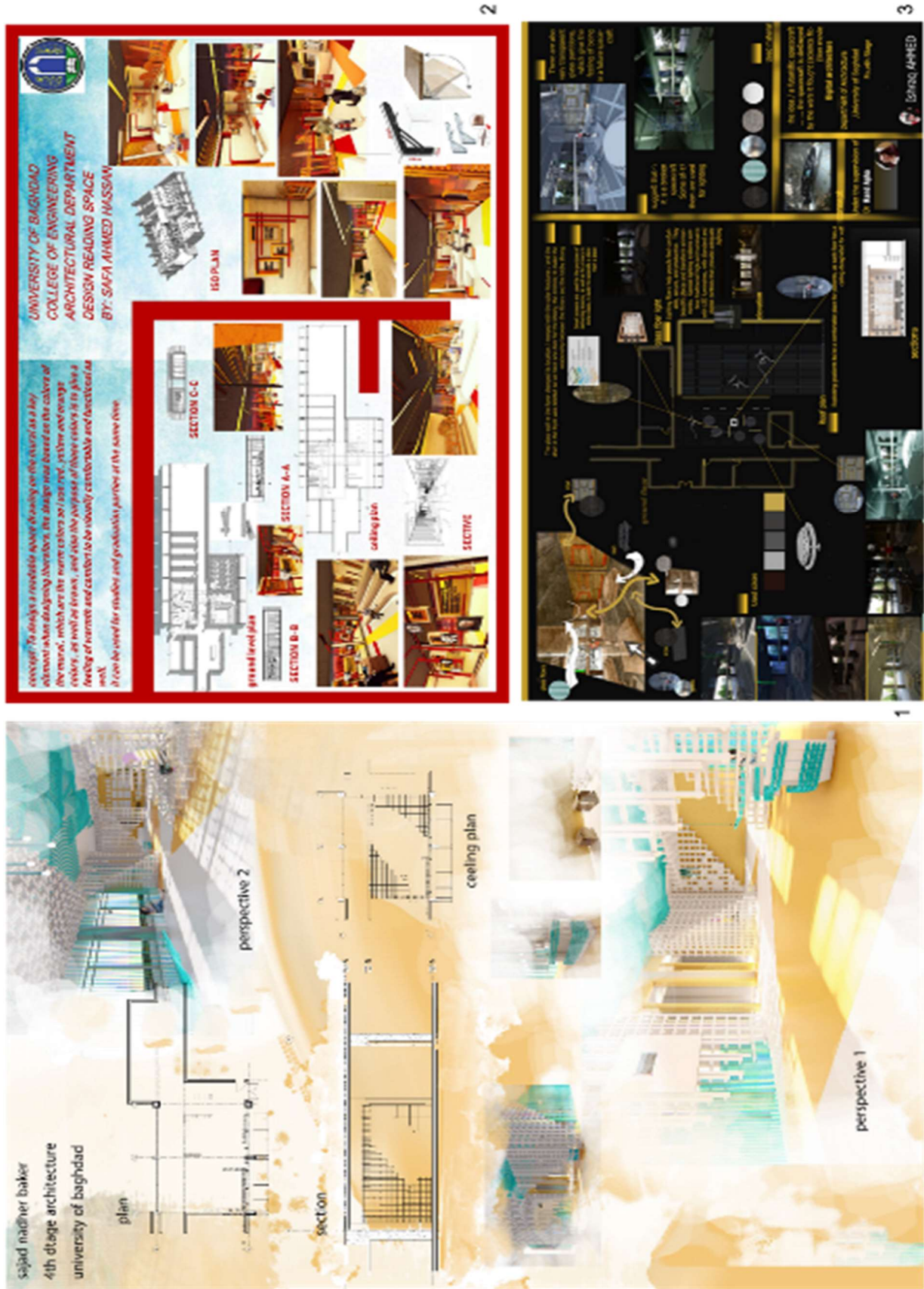
This research used a checklist /Google Form that includes (42) indicators which become (28) after modification, merging, and deleting similar ones. The (28) use a triple estimate scale (1, 2, 3) for each indicator to see the degree of its impact as shown in the figure below.





**Figure 1:** illustrated examples of student’s projects in Design of Interior Space, Department of architecture Engineering, college of engineering, university of Baghdad.

Project: Electronic devices store / International brand  
Year: 2021-2022  
Type: Blended Learning

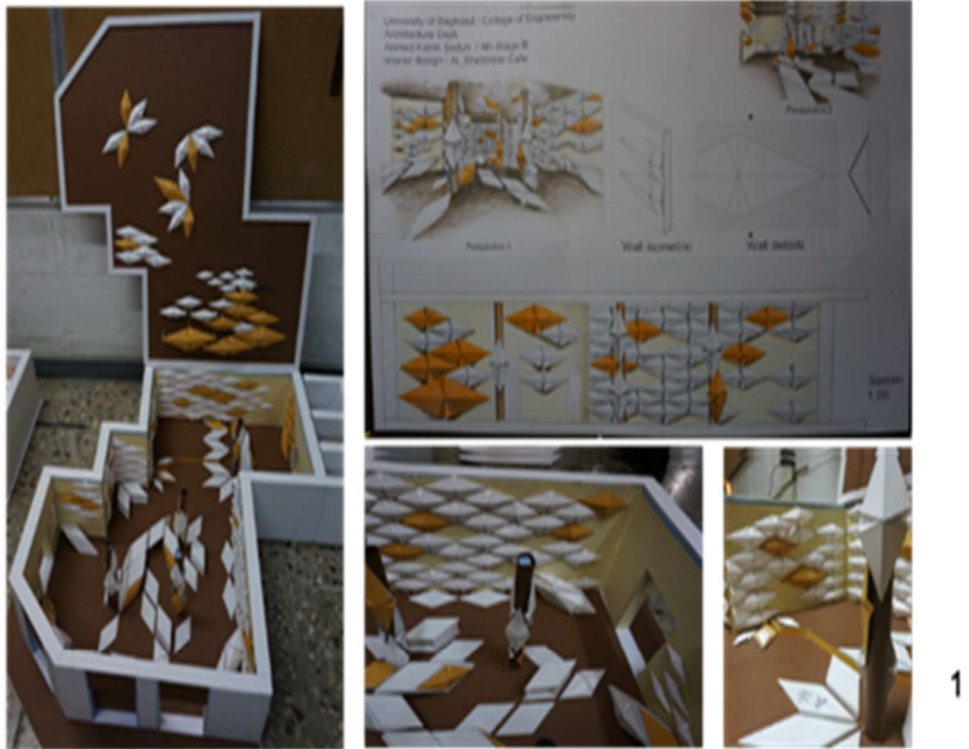


Project: Reading space / using recycled material

Year: 2020-2021

Type: E- Learning





Project: Cafe / using one of three types of design  
Year: 2019-2020  
Type: Traditional Learnin



**Table 1:** Checklist illustrates the indicators and suggestion scale.

Indicators			Degree of impact <sup>1</sup>		
			Weak	medium	Very impact
X1	Curriculum	Achieving inclusiveness of the vocabulary of the language of internal spaces			
X2		Developing the comprehension and expressiveness of visual vocabulary in particular			
X3		Increase the ability of criticize and analyse for better understand of the language of internal			
X4		Developing a capacity for reflective, creative, and problem-solving thinking in the relationship of physical and visual elements			
X5		Enhancing the mental image by using multiple tools to display the vocabulary of the elements of the interior spaces			
X6		Bringing radical changes in classic education through the apply and exchange of interior spaces design material			
X7		Enhancing the self-confidence of the learner by used the trends and intellectual effects of the language of internal spaces			
X8		Emphasis on self-learning to design elements in interior spaces			
X9		Stirring motivation and fruitful interaction of teaching positions for the subject, designing and participating in internal spaces			
X10	The Skiles	Capacity training in using the hardware and applications of the internal space design .programs			
X11		Employing all technology characteristics from design and implementation to the physical and visual vocabulary of interior spaces			
X12		Mastering and flexibility in implementing educational programs that help in preparing the design of interior spaces, for example, using programs to show color, light, and texture			
X13		Address emergency and sudden changes in the language of internal spaces			
X14		Increase the craftsmanship skills to a sense of the third dimension as a model for designing interior spaces			
X15	Technological program	Increased diversity in the mass formation of interior spaces			
X16		Exaggeration in the relationship between the vocabulary of internal spaces, for example, the relationship of color to light			
X17		Enriching details related to the visual elements of interior spaces, for example the fourth dimension			
X18		Flexibility to meet the needs of the language of internal spaces, represented by the relationship of physical and visual elements			
X19		Integration in organizing physical and visual design elements for interior spaces			
X20		An awareness of new relationships in the design vocabulary of interior spaces			
X21		Transparency between vertical and horizontal levels in the design of interior spaces			
X22		Improving the qualitative level of design vocabulary of interior spaces			
X23		Increasing the quantitative production requirements of the interior spaces design			
X24	The Cost	Dramatically reducing the learning costs of the interior space design material (for example reducing the number of paper obsolescence			
X25		The difficulty of providing an equivalent device that meets the needs of modern technological in terms of speed and technique for interior space design program.			
X26		Get the tasks done and invest time to present, design and implement the interior spaces design vocabulary			
X27		Understand programs related to designing elements of interior spaces			
X28		Freedom from time commitment (such as application time)			

<sup>1</sup> \* A score of 1, 2, and 3 is given to each influencing, respectively, with a degree of weak, medium, and very strong impact.

The validity and reliability of the tool were conducted as an exploratory experiment by randomly selecting the students as a second pilot study for the purpose of identifying the clarity of the indicators and the instructions as well as knowing the time taken for the response. The respondents needed (45) minutes from starting time (by Google) to finish their answers. The stability of the tool is shown by the method of re-testing the indicators of impact in the second pilot study, with a time interval of (15) days under similar circumstances, the Pearson correlation coefficient was calculated between the second pilot study and final survey, as the stability coefficient was (85%). and then applying the indicators in a research setting.

The research setting was within the research community which consist of students of the University of Baghdad, College of Engineering, Department of Architecture Engineering, the fourth stage of the academic years 2019 (who used Face to face Learning), 2020 (who used E-Learning) & 2021 (who used Blended Learning). The number of the total community has reached (115 students) for both genders, i.e. (84%) of the total number from which they were selected (166 students). The data were analyzed using the statistical program (SPSS v.24) through factor analysis.

### 3. The result

In order to achieve the research aim, the master sheet was used to gather the data for each respondent, transfer it to the number language (1,2,3), and then use the IBM- SPSS program (version 24) to analyse the data through factor analysis- Varimax to rotate the sample. However, factor analysis is used to reduce the number of indicators which are called factors, and provide factors that have specific characteristics [1]. To override the limitation of the results, the following issues were focused on:

-The limitation of the result, focusing on the following issues: first: to apply the active factors that have Eigen value through 84% from sample variance, and then determine 42% as active value. Second: to exclude the repetition indicators in any late factor. Third: provide at least three indicators in each success factor.

-Analysis stage included three stages (Table 2); these are:

The first stage, aimed to provide a general analysis of all the indicators (X1-X28) to understand the effect on them, curriculum, skill, technological process, the cost, time, and speed that have an impact on the student products in the design of interior space.

The analyzes indicated that there were eight active agents explored in a total of 84.2% of the sample variance. The variance of the first factor was explained (6.12) (23.8%), the variance of the second factor (5.54) was explained (16.4%), the variance of the third factor was (3.26) explained (13.7%) and the variance of the fourth factor

was explained (2.83) (10.6%), the fifth-factor variance (2.22) explained the percentage (8.2%), the sixth-factor variance (1.91) the percentage (6.3%), the seventh-factor variance (1.45) the percentage (3.5%), the eighth-factor variance (0.59) explained by (1.7%).

The important indicators of first factor include: X1, X2, X3, X4, X5, X6, X7, X11, X12, X13, X14, X16, X18, X19, X20, X21, & X27. The important indicators of the second factor include X8, X10, & X28.

However, the other factors will be ignored according to the fall of them to build the structure of the success one related to limitation of the results.

The second stage aims to explore the main factor that influenced students' products in the design of interior spaces. The analyzes indicated that there were eight active agents explored in a total of 84.2% of the sample variance. The variance of the first factor was explained (7.33) by (24.5%), the variance by the second factor was explained by (4.87) by (22.4%), the variance by the third factor was (4.26) explained by (20.5%) the variance by the fourth factor was explained by (3.54) by (5.6%), the fifth- variance (2.24) percentage (4.1%), the sixth- variance (1.66) explained (3.5%), the seventh- variance (0.89) explained percentage (2.4%), the eighth- variance (0.23) explained (1.2.%)

The important indicators of first factor, X12, X27, & X28. The important indicators of second factor include X2, X7, X18, & X20. The important indicators of third factor include: X3, X4, & X9

However, the other factors will be ignored according to the fall of these factors to build the structure of the success one related to limitation of result

The third stage, aimed at exploring the basic factor capable of rep in last stage. The that there were three active agents explored in a total of 84.2% of the sample variance. The variance of the first factor (5.47) is explained (30.6%), the variance of the second factor (4.89) is explained (27.7%), and the variance of the third factor (3.34) is explained (25.9%).

Indicators of first factor include: X3, X4, X7, X9, X14, X19, X21, & X22. The indicators of second factor include X5, X8, X10, X12, X27, & X28. The indicators of third factor include: X2, X13, X15, & X25.

**Table 2:** Different stages of analysis related with their factors

	1 <sup>st</sup> stage		2 <sup>nd</sup> stage			3 <sup>rd</sup> stage		
	1F	2F	1F	2F	3F	1F	2F	3F
X1	.							
X2	.							.
X3	.				.	.		
X4	.				.	.		
X5	.						.	
X6	.							
X7	.			.		.		
X8	.	.					.	
X9	.				.	.		
X10	.	.	.				.	
X11	.							
X12	.		.				.	
X13	.							.
X14	.					.		
X15	.							.
X16	.							
X17	.							
X18	.			.				
X19	.					.		
X20	.			.				
X21	.					.		
X22	.					.		
X23	.							
X24	.							
X25	.						.	
X26	.							
X27	.		.				.	
X28	.	.	.				.	

#### 4. The Findings

The result of the first stage presented two active factors that have affected the student products in the design of interior space.

In this stage, the analysis illustrates the importance of the curriculum through achieving inclusiveness of the vocabulary of the language of internal spaces as illustrated in Project 2, 2019-2020. Increase the ability of criticism and analysis for a better understanding of the language of internal spaces. Develop a capacity for reflective, creative, and problem-solving thinking in the relationship with physical and visual elements. Enhance the mental image by using multiple tools to display the vocabulary of the elements of the interior spaces as shown in Project 3, 2020-2021. Bring radical changes in classic education through apply and exchange of interior spaces design material. Enhance the self-confidence of the learner by using the trends and intellectual effects of the language of interior

spaces. Also, enhancing the skill through employing all technology characteristics from design and implementation to the physical and visual vocabulary of interior spaces as confirmed in Project 3, 2019-2020. Mastering and flexibility in implementing educational programs help in preparing the design of interior spaces for example using programs to show colour, light, and texture. Address emergencies and sudden changes in the language of internal spaces. Increase the craftsmanship skills to a sense of the third dimension as a model for designing interior spaces.

Additionally, the technological process is through exaggeration in the relationship between the vocabularies of internal spaces for example, the relationship of color to light; the flexibility to meet the needs of the language of internal spaces, represented by the relationship of physical and visual elements; integration in organizing physical and visual design elements for interior spaces; an awareness of new relationships in the design vocabulary of interior spaces; and transparency between vertical and horizontal levels in the design of interior spaces as presented in project 1, 2018-2019.

Besides, the time and speed through Understand programs related to designing elements of interior spaces. In this factor, the analysis excludes the cost and focused on the skill more than the curriculum, technological process, and time and speed.

Comparative with the curriculum through an emphasis on self-learning to design elements in interior spaces. The skill through capacity training in using the hardware and applications of the internal space design programs. Then, the time and speed through freedom from time commitment (such as application time). In this factor, the analysis excludes the technological process, and the cost, and highlighted the importance of curriculum, skill, time, and speed in an equal way.

-The result of the second stage shows three active factors that affected the student products in the design of interior space.

In this stage the analysis illustrates the importance of the skill through capacity training in using the hardware and applications of the internal space design programs; and mastering and flexibility in implementing educational programs that help in preparing the design of interior spaces, for example, using programs to show color, light, and texture as highlighted in project 1, 2020-2021.

Besides, the time and speed through understanding programs related to designing elements of interior spaces, and time freedom commitment such as application time. In this factor, the analysis excludes curriculum, technological process, and cost, and highlights the importance of time and speed compared to the skill.

Comparative with the curriculum through increasing the ability of criticism and analysis for better understanding of the language of interior spaces and enhancing the self-

confidence of the learner by using the trends and intellectual effects of the language of interior spaces. Also, enhancing technological process through flexibility to meet the needs of the language of internal spaces, represented by the relationship of physical and visual elements as illustrated in project 3, 2018-2019; and awareness of new relationships in the design vocabulary of interior spaces. In this factor, the analysis excludes the cost, time, speed, and skills and highlights the importance of the curriculum and technological process in an equal way.

Also, it presents the least important to the curriculum through developing a capacity for reflective, creative, and problem-solving thinking in the relationship of physical and visual elements; enhancing the mental image by using multiple tools to display the vocabulary of the elements of the interior spaces as confirmed in project 1, 2019-2020; stirring motivation and fruitful interaction of teaching positions for the subject; designing and participating in internal spaces. In this factor the analysis highlighted on just curriculum and ignored the other themes.

-The result of the third stage highlighted on three active factors that affected on the student products in design of interior space.

In this stage the analysis point on the important once of the curriculum through: developing a capacity for reflective, creative, and problem-solving thinking in the relationship of physical and visual elements; enhancing the mental image by using multiple tools to display the vocabulary of the elements of the interior spaces; enhancing the self-confidence of the learner by used the trends and intellectual effects of the language of internal spaces; and stirring motivation and fruitful interaction of teaching positions for the subject, designing and participating in internal spaces. The skill through: increase the craftsmanship skills to a sense of the third dimension as a model for designing interior spaces as highlighted in project 2, 2020-2021.

The technological process through integration in organizing physical and visual design elements for interior spaces; transparency between vertical and horizontal levels in the design of interior spaces; improving the qualitative level of design vocabulary of interior spaces as presented in project 2, 2018-2019. In this factor, the analysis highlights first the curriculum second the skills, and third the technological process in an equal way, and ignored the other themes. Comparative with the curriculum through: enhancing the mental image by using multiple tools to display the vocabulary of the elements of the interior spaces; and emphasis on self-learning to design elements in interior spaces.

The skill through capacity training in using the hardware and applications of the internal space design programs; and mastering and flexibility in implementing educational programs that help in preparing the design of interior

spaces, for example, using programs to show color, light, and texture.

The time and speed through understanding programs related to designing elements of interior spaces; and freedom from time commitment (such as application time). In this factor, the analysis points to the importance of skills, time, and speed in an equal way and then curriculum, and ignored the technological process, and the cost.

Then present the least important curriculum through increasing the ability of criticism and analysis for a better understanding of the language of interior spaces. Present the skill through addressing emergencies and sudden changes in the language of internal spaces.

The technological process through increased diversity in the mass formation of interior spaces. The cost through the difficulty of providing an equivalent device that meets the needs of modern technology in terms of speed and technique for interior space design programs. In this factor, the analysis shows the importance of the cost compared with additional skills to the curriculum and excludes the time and speed, and technological process.

Therefore, using the blended learning approach in the design of interior space led the participants to their own individual experiences. Additionally, since learners by nature have unique learning styles, instruction in this subject is more likely to meet these needs. It confronts individual differences electronically between students, so their outcomes vary, as they vary in abilities, intelligence, thinking, practical skill, and design ideas. This increases students' motivation to learn.

## 5. Summary and Conclusion

This study explained the importance of blended learning of the student projects in the design of interior space through first, the curriculum in this subject; second, the skills of students in an equal way with time and speed to achieve student projects in interior space; third, the technological process that the student gets it, and exclude the cost.

On the other hand, the multiplicity of direct influence of blended learning on student projects of the design of interior space through: the important of developing the comprehension and expressiveness of visual vocabulary in particular; increase the ability of criticism and analysis for better understanding of the language of interior spaces; developing a capacity for reflective, creative, and problem-solving thinking in the relationship of physical and visual elements; enhancing the self-confidence of the learner by used the trends and intellectual effects of the language of interior spaces; capacity training in using the hardware and applications of the interior 1 space design programs; mastering and flexibility in implementing educational programs that help in preparing the design of interior



spaces, for example, using programs to show colour, light, and texture; integration in organizing physical and visual design elements for interior spaces; understanding programs related to designing elements of interior spaces; and time freedom commitment such as application time.

Comparatively with indirect reflection on enhancing the mental image by using multiple tools to display the vocabulary of the elements of the interior spaces; emphasis on self-learning of design elements in interior spaces; stirring motivation and fruitful interaction of teaching positions for the subject, designing and participating in interior spaces; address emergency and sudden changes in the language of interior spaces; increase the craftsmanship skills to a sense of the third dimension as a model for designing interior spaces; the flexibility to meet the needs of the language of interior spaces, represented by the relationship of physical and visual elements; an awareness of new relationships in the design vocabulary of interior spaces; and transparency between vertical and horizontal levels in the design of interior spaces.

Besides, the least influence of blended learning on student products of the design of interior space through achieving inclusiveness of the vocabulary of the language of interior spaces; bringing radical changes in classic education through the application and exchange of interior spaces design material; employing all technology characteristics from design and implementation to the physical and visual vocabulary of interior spaces; increased diversity in the mass formation of interior spaces; exaggeration in the relationship between the vocabularies of internal spaces, for example, the relationship of color to light; improving the qualitative level of design vocabulary of interior spaces; the difficulty of providing an equivalent device that meets the needs of modern technology in terms of speed and technique for interior space design program.

Also, to exclude enriching details related to the visual elements of interior spaces, for example, the fourth dimension. Increasing the quantitative production requirements of the interior spaces design. Dramatically reducing the learning costs of the interior space design material for example reducing the number of paper obsolescence. Get the tasks done and invest time to present, design, and implement the interior spaces design vocabulary from any impact on the student products of the design of interior space. Therefore, blended learning has a significant effect on the student products for a better understanding of architectural study generally and the design of interior space especially, through integrated traditional learning and e-learning.

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## تأثير التعلم المدمج على نتائج الطلاب في تصميم الفضاء الداخلي

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**الخلاصة** – ظهرت العديد من الابتكارات التكنولوجية في الآونة الأخيرة. أصبح التعليم الإلكتروني شائعاً في التعليم العالي بكونه واحداً من أكثر الطرق فعالية في العالم بأسره، وخاصة العراق، خلال فترة Covid-19. يهدف هذا البحث إلى استقصاء أثر التعلم المدمج على نتائج الطلبة من تصميم الفضاء الداخلي من خلال الإجابة على الأسئلة التالية: ما هي عملية التعلم المناسبة في مادة تصميم الفضاء الداخلي؟ كيف يمكن للتعليم المدمج أن يعزز مستوى نتائج الطلاب من تصميم المساحات الداخلية؟ في هذا البحث، استخدمنا المنهج الوصفي والمنهج الكمي. التعلم المدمج هو تكامل طرق واستراتيجيات التعلم بوسائل مختلفة عبر توظيف أدوات وأساليب التعليم التقليدي بأدوات التعلم الإلكتروني بالشكل المناسب حسب مقتضيات الموقف التعليمي. يزيد استخدام التعلم المدمج من خبرات التعلم بدمج التعليم في الفصل والتعلم الإلكتروني. فضلاً عن تطوير المهارات والمعرفة النظرية من خلال تحسين نتائج التعلم ويسمح بزيادة عدد المتعلمين المسجلين وتخفيف الضغط على المعلمين لتسهيل الوصول إلى المواد التعليمية. كما يوفر هذا وسيلة فعالة للتواصل مع الطلاب. تم جمع البيانات من خلال: مراجعة أدبيات كل من أساليب التعلم في التعليم العالي وهما التعلم الإلكتروني والتقليدي لتصميم المساحات الداخلية. دراسة حالات الفصول الدراسية الحقيقية / التقليدية الفصول الافتراضية / Google Classroom ومزجها لدراسة تصميم المساحة الداخلية. غطت هذه الدراسة السنوات الدراسية (2019-2021) وشملت (115) طالباً وطالبة في المرحلة الرابعة، قسم الهندسة المعمارية، كلية الهندسة، جامعة بغداد / العراق. تم استخدام قائمة التحقق على نموذج جوجل ومن ثم تم تحليل البيانات من خلال برنامج (SPSS). تظهر نتيجة التحليل أهمية المناهج الدراسية مثل تحقيق شمولية مفردات لغة المساحات الداخلية. زيادة القدرة على النقد والتحليل من أجل فهم أفضل للغة المساحات الداخلية. بالإضافة إلى العملية التكنولوجية مثل المبالغة في العلاقة بين مفردات المساحات الداخلية، على سبيل المثال علاقة اللون بالضوء؛ المرونة لتلبية احتياجات لغة المساحات الداخلية. في الجانب الآخر، يوضح التحليل أهمية المهارة من خلال: تدريب القدرات على استخدام الأجهزة والتطبيقات الخاصة ببرامج تصميم الفضاء الداخلي. والإتقان والمرونة في تنفيذ البرامج التعليمية التي تساعد في إعداد تصميم المساحات الداخلية، على سبيل المثال، استخدام البرامج لإظهار اللون والضوء والملمس إلى جانب ذلك، الوقت والسرعة مثل فهم البرامج المتعلقة بتصميم عناصر المساحات الداخلية؛ والالتزام بحرية الوقت مثل وقت التطبيق. لذلك، خلصت هذه الدراسة إلى أن التعلم المتكامل وجهاً لوجه والتعليم الإلكتروني له تأثير كبير على منتجات الطلاب لفهم أفضل للدراسات المعمارية بشكل عام وتصميم المساحة الداخلية بشكل خاص.

**الكلمات الرئيسية** – التعلم المدمج، التعلم التكيفي، تصميم الفضاء الداخلي، الدراسة المعمارية، العراق.