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Research Article

Architecture Students Self-report Well-being Assessment Based on Quality Learning Environment in Design Studio

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ABSTRACT

Higher education students' difficulties, especially students in architecture education, lead students to health problems. The design studio is the heart of architecture education and students spent most of their time with staff. Students tend to do various activities in the studio such as demonstrating, model-making, drawing, and lecturing. Therefore, the learning environment in the studio should attract students to spend most of their time in the studio happily. This research focused on a mixed method to assess the relationship between students' well-being and the quality learning environment in the design studio. The students' self-report assessment for the well-being situation has been used that depends on student's experience to the design studio. For this reason, architecture design studios at private universities in Erbil city have been selected as a case study. The statistical program SPSS has been used to test hypotheses and analyze data. The findings of this study represent the significant positive relationship between students' well-being and the quality learning environment in the design studio. Furthermore, the study illustrates the significant of the quality learning environment in design studio and its roles in the development of the students' well-being.

Keywords: Quality learning environment, student's well-being, architectural design studio, private universities, architecture education

INTRODUCTION

Conventionally, the establishment of a healthy learning environment is concerned with the improvement of students' well-being and health.[1] In the past decade concern for students', well-being has increased due to its impacts on health,[2,3] psychological distress, and learning outcomes.[4] Students' satisfaction and positive attitudes to the learning environment are the critical issue in well-being assessment.[5,6] Students' well-being is linked to the learning outcome, student's performance, pro-social behaviors, positive relationships, creativity, and health.[7-11] However,[6-12] realized that environmental factors of the learning process are the main pillar of students' well-being. Well-being in a learning environment encompasses the development of the learning process, social relationship with students and peers, increasing students' cognition, and encouraging creative and critical thinking.[13,14] Therefore, the classroom has been described as a physical environment that functions as a social and cultural space that must support students' needs and learning objectives.[13] The quality learning environment in the literature is described as an adaptable environment that is flexible and obtains all student's needs.[15,16] Creating an optimal learning environment improves effective educational space that enhances students' performance, motivation, health, and well-being.[17,18] The reference[19] indicated that the learning environment contains the physical environment, social activities, motivational and psychological environment,[20,21] and teaching/learning process,[14] the physical environment of the classroom is considered one of the most important indicators that determine benefits in student learning. The reference[15] claimed that the process of teaching and learning architecture necessitates a comfortable environment that promotes lectures, design projects, and tutorials. Because students spend so much time in architectural studios, the setting must be stimulating and inspirational. Teaching architecture differs from teaching other built-environment disciplines. Architectural education requires not only practical and theoretical features but also an engaging learning environment that encourages social relationships.[22] As the foundation of architectural education, the design studio is regarded as a living-learning environment for architectural students. It is the location where architectural students spend a significant amount of time engaging in various

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socioeducational activities. As a result, the studio should cater to the students' demands. The design of the studio should be carefully considered to promote student productivity, creativity, and enjoyment.[23] The environment of the design studio is one of the aspects which affect and stimulate the learning ability of students and also have a greater impact on the effective outcome of the students.[24,25] As a result, QLE is dependent on its ability to meet students' requirements and keep their knowledge, as well as students' proclivity to study. The process of creating a quality educational environment can be sped up by adopting a clear methodology and a set of well-defined principles and important components of social processes, physical space, and learning technologies. Students in good learning environments develop logical thinking and higher achievement without a doubt.[26,27] Creating ideal learning and teaching environments are an art that promotes student performance and motivation while also allowing students to collaborate and improve their cognitive functions.[18] A healthy learning environment relieves pupils of physical discomfort, allows them to focus on schoolwork, and encourages students to think logically. Students in good learning settings surely achieve more. A poor learning environment, on the other hand, is frequently drab in color, inadequate in lighting, noisy in the surroundings, and lacking in air ventilation. Students in inadequate learning environments have numerous physical challenges. The purpose of this study is to shed the light on the relationship between students' well-being and Quality Learning Environment in the design studio. For this reason, private universities in Erbil have been selected as case studies. The mixed methodology has been used to analyze the data collected from the questionnaire and checklist. The statistical analysis in this study is descriptive, correlation, one-way analysis of variance (ANOVA), and t-test. Hence, the finding of this study improves the learning environment of design studios and tends to define the improvement factors of well-being.

LITERATURE REVIEW

Various studies studied the learning environment in the design studio and its impacts on students' outcomes and performance. In his study, El Zaza[26] attempted to employ post-occupancy evaluation of the learning environment to find elements that affect students' satisfaction in the design studio. According to the author, lighting, thermal comfort, indoor air quality, and workplace environment are the primary characteristics related with students' happiness with the indoor learning environment and affect students' efficiency. They distributed semi-structured questionnaires to 60 students, and 55 of them were valid. They employed descriptive analysis to examine the questionnaire. The first segment covered building elements, while the last section used a five-point Likert scale to gauge student satisfaction. The findings revealed that the workstation, indoor air quality, and thermal comfort contributed to students' pleasure; however, artificial light had no effect. The finding showed that the students' satisfaction has been achieved through the workspace, indoor air quality, and thermal comfort while that of artificial light has not been properly met. The result highlighted the factors of the learning environment that affect students' comfort are the classroom, school location, school facility, school climate, and technology. Obeidat and Al-Share[15] focused on a quality learning environment in their study, and due to a dearth of research in this sector, they chose a design studio classroom as a case study. They investigated students' opinions of the learning environment to establish students' requirements and goals for a quality learning environment in architectural studios. A survey method was employed to acquire 94 student responses. This study's findings reflect earlier research indicating the physical environment that has a direct impact on space users' pleasure. The data imply that lighting, noise, glare, air quality, temperature, seat comfort, and layout options are all important environmental aspects in achieving an ideal educational environment. Besides, Muniandy *et al*.[17] indicated that architectural design studios have different physical settings regarding the culture; therefore, they focused on the physical environment of architecture studios and how it contributes to the social environment at Malaysia University. A questionnaire survey with Likert-scale components and semi-structured interviews has been used. The influence of these physical indicators on students' milieu was investigated under Maslow's theory of human motivation.

Furthermore, Ibrahim *et al*.[22] highlighted a number of researches that focused on architecture curriculum and teaching methods; thus, they concentrated on the constructed environment of architecture design studios and its effects on student happiness. The design of learning settings, such as classes and studios, has a significant impact on student pleasure and performance. To assess student happiness, a survey was given to six architectural departments. Each section is evaluated in terms of spatial organization, accessibility, and physical studio qualities. Furthermore, the effect of the learning environment in student well-being has been investigated.[28] The developed indicators will allow the teachers to clarify the situation, draw conclusions, and improve the organizational culture. The goal of the research is to find out which indicators reflect the student's well-being and how to measure them. The study associated well-being with the following factors: Self-acceptance, positive relationship, autonomy, competence, and self-regulation of behavior. In addition, González-Zamar *et al*.,[13] for the bibliometric review focused on Higher Education University classrooms and students' well-being and motivation. The purpose of their study was to analyze the research trends on the impact of the university educational space on the well-being, motivation, and social interaction of the student, considering the physical-environmental, socioperceptual, and motivational attributes. Regarding the factors that define well-being, self-acceptance, mastery of the environment, personal growth, self-efficacy, positive relationships with other individuals, autonomy, and having a purpose that makes sense stand out in life. According to Stanton *et al*.,[29] despite the identification of learning settings as a possible setting for developing and promoting well-being, little research has been conducted to investigate students' perceptions of well-being in learning environments. To investigate students' conceptions and experiences of well-being in learning environments, a semi-structured focus group and interview technique were utilized. The findings shed light on multiple pathways through which learning experiences contribute to student well-being and provide insight into how courses might be designed and delivered to improve student health, learning, and engagement. The findings also look into

the relationship between happiness, contentment, and deep learning.

Research Problem

Organizations such as the World Health Organization concentrate on research to create a healthy learning environment. The previous research focused on well-being and student performance, as well as students' knowledge of well-being. However, research on the learning environment focuses on the architecture department's curriculum. Furthermore, there has been few research on the learning environment of design studios and the well-being of students. As a result, the focus of this study is on the impact of a high-quality learning environment on students' well-being in architectural design studios at Erbil's private institutions. It also confirms the presence of superior learning environment components in the design studio.

Research Aim

This study aims to define the availability of a quality learning environment in design studios due to students' needs and well-being. Moreover, this study tries to highlight the dimensions of well-being and their definitions in the learning environment of design studios. The dimensions of well-being are physical well-being, psychological well-being, and social well-being.

Research Objectives

The followings are the main objectives of the research:

1. To assess the existence of quality learning environment factors in the design studio
2. To establish the correlation between dependent and independent factors
3. To define the variables of quality learning environment that have the most impact on students' well-being.

THEORETICAL FRAMEWORK

The assessment of well-being can be addressed objectively depending on the quality of life indicators and norms called objective well-being.[1] On another hand, it can include an individual's life experience and self-report about the perception of the learning environment named subjective well-being (SWB).[30] The difference between the two types of well-being showed in Figure 1. Furthermore, lower objective standards of life may not always imply lower levels of SWB and *vice versa*. This research utilizes students' self-report assessment of the learning environment.

The quality of students' well-being in this research concerning the well-being dimensions is psychological well-being, physical well-being, and social well-being. The term psychological well-being refers to psychological functioning such as the feelings toward the capabilities of doing work, self-development, and feeling positive toward personal development.[28,31,32] However, the term physical well-being is based on the physical health of students.[33] Moreover, in the learning environment, physical well-being is based on the comfortable learning environment regarding the lighting, temperature, and thermal environment.[34,35] Social well-being is based on the social environment in the design studio, which includes the relationship with friends and peers, and having a supportive and collaborative environment to engage with others.[9,23]

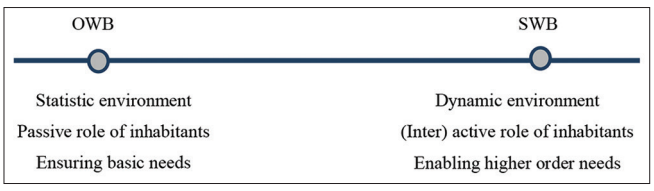


Figure 1: Well-being aspects focusing on objective condition and subjective experience of well-being[30]

The layout arrangement of the design studio has a significant impact on the physical, and social environment, and teaching style. The flexibility of the arrangement layout encourages collaboration, creativity, livable natural setting, and responds to the changes in need in the design studio such as demonstration, group work, lecturing, and individual working.[14,20] For this purpose, furniture should be light in weight and movable[15]. "Table 1" shows the possible arrangement layout in architectural studios. Arrangement layout affects human behavior, sense of belonging, sense of community, and teaching style. Anthropometrics and ergonomics of furniture is a subject of furniture dimension to fulfill students' needs and the human body. The drafting table in the design studio should have at least (1.2* 0.80 m), with stools that are defined as the best seat type in the design studio to control model-making and drawing activities.[36,37] The spacing between seats defines the privacy of seats and establishes the movement pattern inside the studio.[38,39]

The lighting condition in the design studio has unique characteristics. Both natural and artificial lighting is preferred to be available in the design studio. The artificial lighting in the design studio should be evenly distributed.[40-42] For the natural lighting condition, it is preferred to have a window on both sides to avoid glare for drawing and laptop work.[22] Moreover, north-facing windows are the best window orientation in a design studio.[43] Thermal comfort is defined as the most important indoor environment quality parameter that affects satisfaction and comfort (Ibrahim *et al*., 2019). Thermal comfort factors are air temperature, humidity, and air velocity. The perception of thermal comfort varies among cultures.[44] Temperatures between 68 and 74°F–20 and 24°C– are described as comfort levels. Furthermore, 50% relative humidity is defined as an acceptable value for educational spaces in most cultures.[21] Thermal comfort improves physical and psychological satisfaction.[17] Thermal dissatisfaction reduces students' concentration and creates physical stress.[37]

Besides these factors of quality learning environment, a view of the outside landscape is defined as a source to improve students' motivation and help them relax.[14,20] The design studio has to be placed near the landscape context to observe a tree, garden, and natural environment. Besides, the size of the window defines the connection between the indoor and outdoor environment. The esthetic value in the design studio is defined as the quality of wall color or the existence of the works of the pillars of the architecture to promote creativity.[21,22,36,44] Table 2 demonstrates the research framework.

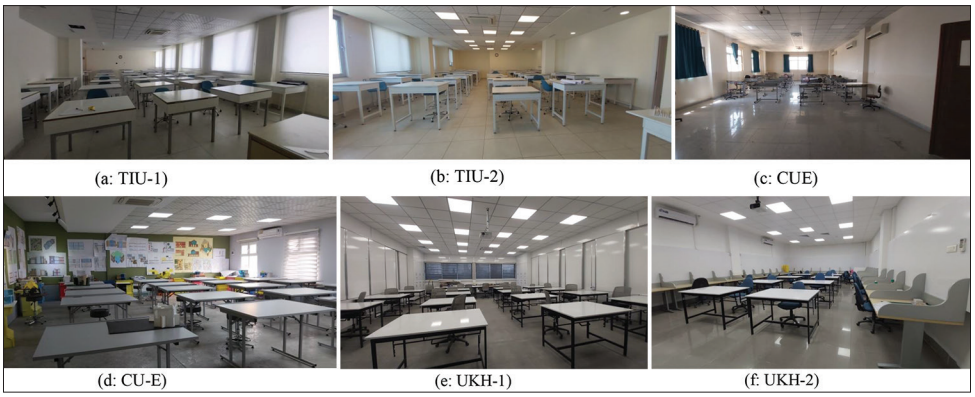


Figure 2: Case studies (researcher)

Table 1: Arrangement typology in a design studio (researcher, adapted from[14,22,26,47,48])

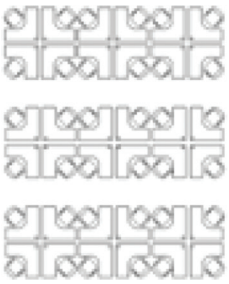
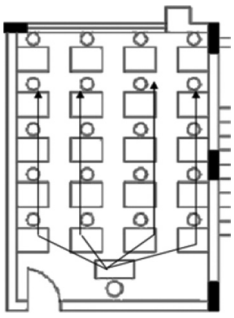
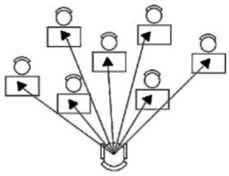
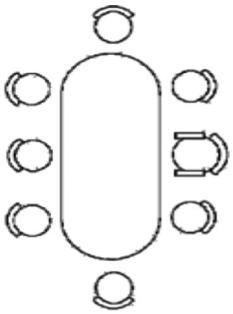
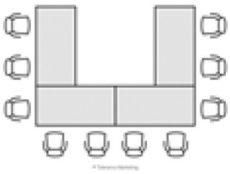
1. Office-like (cubical)	2. Raw method	3. Clustered	4. Small groups	5. U-shaped or circular
				

Table 2: Research framework (researcher)

Variables	Indicators
Quality learning environment	
Flexibility	Easy of changing furniture layout
Anthropometrics and ergonomics of furniture	Suitable furniture with human joints
Lighting	Adequate artificial and natural lighting
Temperature	The comfortable temperature inside the studio
View to landscape	Quality of outside view from studios
Esthetic	Quality of wall color and paintings
Indoor circulation	Dimension of the movement paths in the studio
Territoriality	Personal limitations in the studio
Privacy	Adequate and private space per student
Well-being	
Physical well-being	Having the physical health being in a comfortable environment doing activities in the studio and having a feeling of joy and excitement
Psychological well-being	Having a purpose for what I o in the studio Being able to improve personal skills Feeling motivated and encouraged to work in the studio
Social well-being	Being accepted by others have a good relationship with students have a good relationship with peers having a supportive environment to collaborate and group work

Privacy in architectural studios is establishing adequate space for individuals to experience all types of activities comfortably without being isolated from others.[14,45] Space between seats,[22] furniture arrangement, and personal storage are defined as variables to satisfy students' privacy within the studio, Students feel more comfortable being physically and visually secure. Therefore, shelves or cubbies can be added to obtain privacy. Moreover, the area per user within a design studio is estimated between (4 and 4.5) m^2 to be able to function well.[26] Personal storage for the students and instructors provides a sense of belonging and improves self-esteem. The territoriality in the workspace environment is a sense of ownership of the physical elements.[46]

METHODOLOGY

This study relied on a mixed methodology for the data collection and analysis process. In the qualitative approach, the researcher walkthrough has been used for the nine quality learning environment factors. In the quantitative process, the research questionnaire for the nine quality learning environment factors and three well-being dimensions has been applied. The statistical analyses for this study are descriptive analysis, correlation analysis between dependent and independent variables, the analysis of the existence of the variables using t-test analysis, and the ANOVA to define the availability of factors in design studios.

Scope of the Study

The department of architecture at Erbil University is among the college of engineering. The universities are classified as

Table 3: Demographic of the study (researcher)

University	Current number of students	Sample size	Studio	The sample that I took
Tishk International University-Erbil	377	129	TIU-1	61
			TIU-2	68
University of Kurdistan-Hawler	60	22	UKH-1	13
			UKH-2	9
Cihan University-Erbil	152	47	CU-E	47
Catholic University Erbil	25	13	CUE	14
Total	614	211		211

Table 4: Descriptive statistics for the variables (researcher)

Variables	Mean	SD	%
Flexibility	3.39	0.87	67.77
Anthropometrics and ergonomics of furniture	3.05	0.95	61.04
Lighting	3.59	1.42	71.85
Temperature	3.18	0.93	63.55
View to landscape	2.88	0.95	57.54
Esthetic	2.89	0.85	57.82
Indoor circulation	3.09	0.99	61.90
Territoriality	3.00	1.04	60.09
Privacy	2.89	0.91	57.87
Physical well-being	2.96	0.70	59.16
Psychological well-being	3.21	0.78	64.17
Social well-being	3.46	0.74	69.29

Table 5: T-test results for the existence of variables according to students' questionnaire (researcher)

Variables	t-value	*P*-value
Flexibility	56.456	0.000**
Anthropometrics and ergonomics of furniture	46.68	0.000**
Lighting	36.76	0.000**
Temperature	49.571	0.000**
view to landscape	43.783	0.000**
Esthetic	49.524	0.000**
Indoor circulation	45.377	0.000**
Territoriality	41.981	0.000**
Privacy	46.258	0.000**
Physical well-being	61.733	0.000**
Psychological well-being	59.712	0.000**
Social well-being	68.357	0.000**

governmental, international, and local private universities. This study used private universities as a case study, that are (1) Tishk International University-Erbil (TIU), (2) the University of Kurdistan Hewler (UKH), (3) Cihan University-Erbil (CU-E), and (4) catholic university Erbil (CUE). From the universities of TIU and UKH, two studios per university have been selected

Table 6: ANOVA analysis for studios (researcher)

Variable	Studio	Mean	SD	f-value	*P*-value
QLE	TIU-1	3.07	0.48	2.651	0.024
	TIU-2	3.31	0.64		
	CU-E	2.96	0.55		
	UKH-1	3.26	0.66		
	UKH-2	2.21	0.94		
	CUE	3.22	0.50		
Well-being	TIU-1	3.12	0.66	2.738	0.020
	TIU-2	3.45	0.49		
	CU-E	3.09	0.53		
	UKH-1	3.21	0.58		
	UKH-2	3.15	0.76		
	CUE	3.38	0.40		

ANOVA: Analysis of variance, TIU: Tishk International University-Erbil, UKH: University of Kurdistan Hewler, CUE: Catholic University Erbil, CU-E: Cihan University-Erbil

Table 7: Correlation analysis between the dependent and independent variable (researcher)

Correlation	Well-being
QLE	
Pearson Correlation	0.608**
Sig. (2-tailed)	0.000**

** Correlation is significant at the 0.01 level (2-tailed)

as case studies. As a result, the six studios from four private universities are studied. Figure 2 illustrates the case studies.

Sample Size

A statistician was contacted to get the statistically appropriate ratio sample size. Using the sample size equation, the total sample size of the questionnaire is 211, with a total population of 614, as equal to 34.36% of the total students. The selected sample size achieved a confidence level of 95% confidence level and a 5% error margin. [Table 3] demonstrates the demography of the research data collection.

RESULTS AND DISCUSSION

The quantitative analysis of the questionnaire data represents the descriptive mean of the quality learning environment

Table 8: Simple regression in general for dependent and independent variables (researcher)

Independent	Dependent			
	Constant	$ß_0$	F	R^2
QLE	1.28 t (7.248)	0.620 t (11.064)	122.4 (0.000)**	41.6%
	P-value (0.000)**	*P*-value (0.000)**		

Table 9: Mean of quality learning environment for studios according to the checklist (researcher)

Variable	Studio	Mean
QLE	TIU-1	3.41
	TIU-2	3.53
	CU-E	2.71
	UKH-1	3.39
	UKH-2	2.80
	CUE	3.29

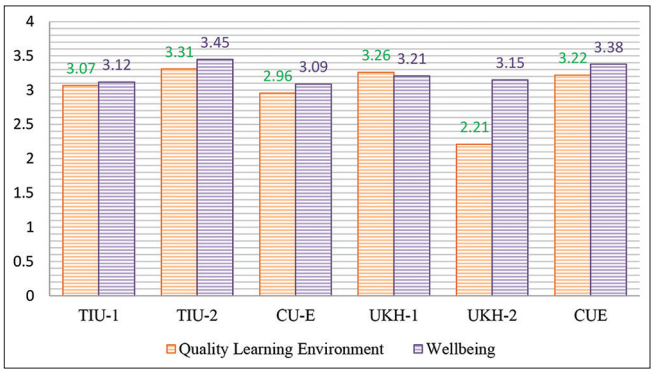


Figure 3: The mean of the quality learning environment and well-being for studios (researcher)

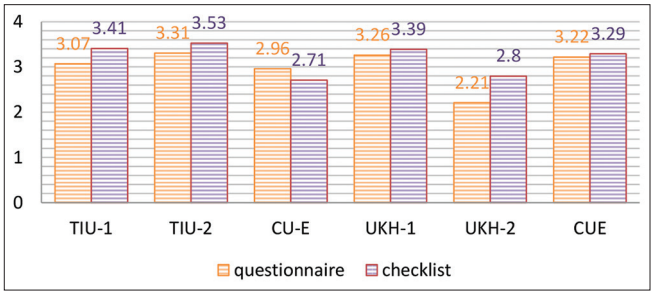


Figure 4: Mean of quality learning environment for studios according to the checklist (researcher)

factors in private universities [Table 4]. The majority of the research questionnaire agreed on the existence of quality natural and artificial lighting with the greatest satisfaction mean of (3.59), and a percentage of satisfaction of (71.85%). Nevertheless, the view to landscape environment has the least mean value of (2.88), with a percentage of satisfaction of (57.54%). The percentage of satisfaction with quality learning environment variables and well-being dimensions are at the medium level; therefore, there is no perfect existence of the quality learning environment factors to improve students' well-being in architectural design studios.

To analyze the significance of the existing variables in the design studio, the t-test analysis was adopted for the variables. The significant ($P = 0.05$), accordingly, *P*-value is highly significant for all variables. Therefore, the existence mean of variables is significant in all studios, as shown in [Table 5].

The one-way ANOVA was applied to demonstrate the mean difference among the case studies. As shown in [Table 6], TIU-2 has the highest mean value of quality learning environment factors with a total value of (3.31) and its students have the greatest well-being value with a total of (3.45). However, UKH-2 has the lowest quality learning environment value of (2.21), and CU-E has the lowest student well-being value of (3.09). As a result, the design studio of Tishk International University has the highest quality learning environment and well-being value [Figure 3].

To define the relationship between the dependent variable (well-being dimensions) and independent variable (Quality learning environment variables), this research conducted the Pearson correlation analysis. The range of correlation coefficients is from −1.00 to +1.00. Several −1.00 denotes a perfect negative correlation, whereas a value of +1.00 denotes a perfect positive correlation. A two-tailed statistical significance test with a range of 0.05–0.01 was performed on the correlation technique. According to [Table 7], the correlation analysis represents the perfect positive correlation between well-being and quality learning environment with a Pearson correlation value of (0.608). As the value of significance which is the collection of all factors value is smaller than 0.01 and 0.05, the correlation is significant. From this, we can conclude that the development of quality learning environment variables can improve students' well-being. Moreover, the increase in students' well-being in the learning environment encourages students to spend most of their time in the design studio happily with greater achievements and performance.

The regression analysis in this study clarifies the impact of independent variables (Quality learning environment) influences the dependent variable (well-being). The regression analysis in [Table 8] indicated that quality learning environment variables cause 41.6% changes in students' well-being. Moreover, the result is highly significant because $P < 0.01$ and 0.05.

On another hand, the qualitative researcher checklist in [Table 9] represents the mean value of quality learning environment variables in the six architectural design studios. According to the checklist, TIU-2 has the highest mean with a total value of (3.53), and then, it is followed by TIU-1, UKH-1, and CUE with values of (3.41, 3.39, and 3.29). The architectural design studios with the least mean value are UKH-2 and CU-E with values of (2.8, 2.71), as shown in (Figure 4).

CONCLUSION

The present study justified the impacts of quality learning environment variables such (as flexibility, anthropometric and ergonomic, natural and artificial lighting, temperature, esthetics, view to outside, indoor circulation, territoriality, and privacy) on students' well-being. The well-being dimensions in the present study are defined to be physical well-being, psychological well-being, and social well-being. The mixed methodology has been used for the data collection method. The qualitative method in this study depended on collecting data from photos and researcher walkthroughs, while the quantitative method represents the data collected from students' questionnaires. The SPSS program has been used to statistically analyze the data to get the research objectives. The result indicated that Tishk international university studios have the highest quality learning environment and the greatest students' well-being perception. Thus, the t-test analysis represented the existence of the quality learning environment variables in design studios in private universities. This study has significant value in the field of scientific research due to the investigation of the correlation between two group variables that have not been described yet. Moreover, the development of quality learning environment factors improves the students' well-being. Furthermore, the development of students' well-being encourages a healthier learning environment that attracts students to spend most of their time in the design studio with greater achievements and outcomes.

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