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Exploring the attitudes of interior design students in the associate degree program at Al-Balqa Applied University towards environmental sustainability

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Abstract

The purpose of this research is to examine the perspectives of college students regarding environmental sustainability. A cross-sectional survey was utilized to quantify the participants' degree of environmental concern and the influence of the academic year on their perspectives regarding environmental sustainability. A questionnaire was administered to a sample of 82 students enrolled in the Interior Design programmer at Al-Balqa' Applied University-Faculty of Irbid College in Jordan. A three-part survey was administered to students of interior design, encompassing inquiries on demographics, ecology and environmental sustainability, and remarks, to elicit their feedback. The findings indicated that although the students' level of interest in the environment was restricted, they generally held favorable attitudes towards it. Despite occasional inaccuracies in the information presented, students generally demonstrated a comprehension of environmental issues. The study revealed a conspicuous absence of practical implementation of the products and solutions in the students' projects, despite the findings indicating that the students possessed the knowledge of how to apply them in interior design contexts. Furthermore, a disparity was observed between the students' self-reported actions and their actual conduct. The results of the research indicate that there was no significant impact on the attitudes and viewpoints of students toward environmental sustainability, regardless of their level of study or area of specialization. Research has shown that students who possess high levels of motivation and conscientiousness can be guided towards environmental sustainability through the application of responsible design principles, resulting in noteworthy achievements. The

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outcomes of this investigation will assist in enlightening educators of interior design on the perspectives of students concerning ecological sustainability. The results underscore the importance of implementing sustainability criteria in interior design endeavors and the necessity of affording students with maximal exposure.

Keywords: Attitudes, Behavior, Cognition, Education, Environment, Ecology, Interior Design, Practice, Sustainability.

1. Introduction

The field of interior design has undergone a notable transformation in recent times, primarily due to design methodologies that priorities the creation of ecologically sustainable and health-promoting spaces that cater to the needs of individuals for habitation, work, and recreation. (Kibert, 2016; Steinfeld & Maisel, 2012)

However, there are just a few options available for interior designers to choose from when it comes to sustainable practices in real design practice (Moubarak, 2018; Bumgardner, 2020). According to the findings of a number of research, fundamental beliefs and perspectives need to be revised in order for long-term adjustments to be successful (Mate, 2009). Developing habits that are beneficial to the environment is necessary if we are going to lessen our negative effects on the planet and work toward a more sustainable future (Zhang& Tu,2021).

As mentioned by Khalili et al. (2015) and Alves et al. (2018), higher education should make an effort to equip students with the attitudes, beliefs, and behaviours necessary to create both local and global values. Students must apply the knowledge, abilities, attitudes, and values they acquired in college to their professional and personal lives as well as their surroundings once they have graduated (Brundiers & Wiek, 2017). Education about the environment is essential (King, 2015; Chen & Martin, 2015). The aforementioned barriers can also be overcome by education, which should also be more rooted in the local environment and meet the needs of the community for participatory scientific knowledge (Herranen et al., 2018; Alm et al.,2022).

According to Stark and Gyu (2016) and Ashour (2020), professionals in the design field bear a considerable responsibility in spearheading efforts towards sustainability. Scholars and pioneers in the scope of interior design have determined that it is incumbent upon us to consider the needs and diverse expectations of the individuals who will be inhabiting the spaces we create, as a means of fulfilling our responsibility to the planet and its inhabitants The importance of sustainability in interior design extends beyond the mere selection of "ecological" materials (McCoy, 2012). According to Dokter et al. (2020), it is equally crucial to align these materials with the client's

values and desired aesthetic for their space. The main aim is to acquaint interior design students with the implementation of eco-friendly materials and techniques, as stated by Hayles (2015). Additionally, sustainability is an integral aspect of every topic and project in interior design, according to Ching (2018). Lee et al. (2013) suggest that additional efforts are required to promote the adoption of environmentally sustainable practices within the field of interior design in order to achieve success.

The Council for Interior Design Accreditation (CIDA) has issued a mandate that requires academic programs to incorporate sustainability education into their curriculum. In 2018, a professional standard was established which included a specific criterion (14) pertaining to "ecosystems and comfort." As per this particular standard, professionals in the field of interior design are expected to apply the fundamental principles of indoor air quality, acoustics, and thermal comfort with regard to their effect on the environment and the overall well-being of individuals. As per the Canadian Interior Design Accreditation Council (CIDA), the aforementioned criterion enables graduates to make valuable contributions towards devising effective strategies that ensure optimal well-being, performance, and comfort within interior environments. Furthermore, it promotes an increased level of consciousness among alumni with regards to the ecological ramifications of their design decisions (CIDA, 2019)

2. Literature review

The design approach that gives priority to environmental considerations is often referred to as environmental design. green design, eco-design, or sustainable design (Jiang, 2021; Suárez & Domínguez, 2020). Sustainable design is a comprehensive perspective and ideology that endeavors to optimize the caliber of the constructed milieu, while concurrently reducing and eliminating any detrimental impacts on the ecological milieu. Consequently, sustainable design has emerged as a prominent movement within the realm of architecture and design. The aforementioned statement pertains to the fact that sustainable design endeavors to optimize the standard of the constructed milieu (Lechner, 2014). Sustainable design is known to have a reduced environmental impact, which can be attributed to various factors such as the choice of an eco-friendly location, the quantity of water and energy consumed, and the types of materials utilized (Russell-Smith et al., 2015; Kibert, 2016).

The objective of creating a sustainable interior environment is to incorporate the design process framework as a flexible methodology that adapts to the designers' requirements, while also identifying, categorizing, and controlling pertinent data prerequisites. According

to Ashour et al. (2018), this measure has the potential to enhance the eco-friendliness of the environment. The integration of sustainable practices throughout the design process, from the planning phase to post-occupancy, is a crucial factor for the success of a project, as evidenced by the results of various studies (Obeidat, 2013; Rashdan & Ashour, 2017). The attributes of sustainable interior design exhibit a degree of variability, with varying degrees of importance. Thus, in order to enhance opportunities for collaboration between interior designers and users, it is necessary to adhere to specific methodologies, as suggested by Luederitz et al. (2017). In addition to amalgamating user interests, cost considerations, temporal constraints, and technological aspects, adherence to specific temporal parameters is also imperative. The integration of sustainability into the project's design introduces an additional element, as noted by Karunathilake et al. (2019).

As mentioned by Genget et al. (2019), sustainable interior design comprises three fundamental elements, namely energy consumption, material utilization, and interior environment quality (IEQ). Zhang et al. (2017) investigated the topics of water usage and waste management. Efforts to efficiently combine site, energy, water, materials, resources, and interior environment result in the creation of a sustainable constructed environment. This supplementary aspect pertains to the internal surroundings of the edifice (Kylili & Fokaides, 2017). According to Chen Austin et al. (2020), the responsibility of selecting materials and implementing energy-efficient systems with low consumption primarily rests with interior designers. The utilization of indigenous materials, construction guidelines, passive solar technologies, natural ventilation, and lighting are commonly associated with sustainable design proposals, as per the works of Akadiri et al. (2012) and eliker (2017). The reason for this is that indigenous resources are more readily accessible and entail lower transportation costs.

The mind map depicted in Figure 1 has been derived from Demirkan and Afacan's (2018) table titled "Key references for successful environmental utilisation." The presented diagram depicts the fundamental principles of sustainable interior design. Giannelloni's (1998) broad and abstract notion posits that ecological behaviour can either prevent or contribute to the harm inflicted on the natural environment. The ecological perspective posits that behaviour is influenced by environmental challenges, including but not limited to pollution, population growth, depletion of natural resources, and extinction of animal and plant species. Positive cognitive and behavioural reactions are observed in response to these challenges. According to Giannelloni, individuals tend to be deeply rooted in the natural world, and our actions can potentially result in immediate and

direct impacts on the environment. The notion emphasises that our routine actions, which may seem innocuous as consumers and citizens, strive to be ecologically sustainable (Giannelloni, 1998).

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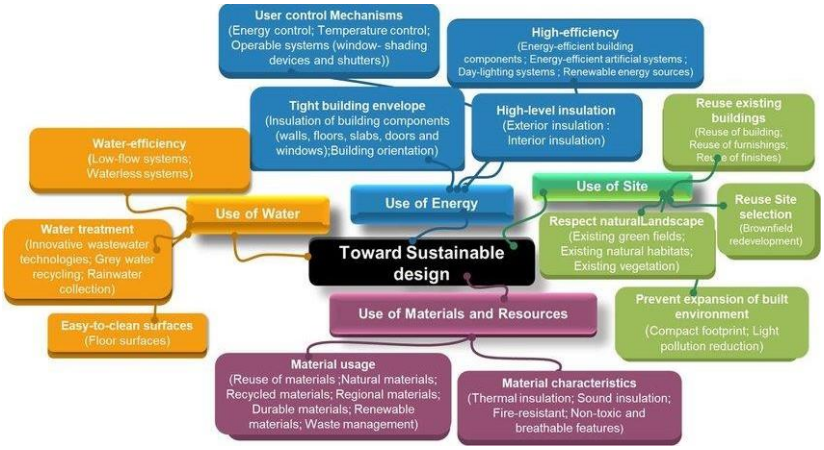
Figure 1. Towards the design of a sustainable interior environment, Demirkan & Afacan, 2018.



The examination of the knowledge, attitudes, and behaviors of university students regarding the environment is crucial in the larger context, given that university students are among the most significant future decision-makers (Fu et al., 2017; Ahamad, & Ariffin, 2018; Janmaimool & Khajohnmanee, 2019). De los Rios and Charnley (2017) assert that contemporary designers who enter the industry are faced with a saturated market that emphasizes sustainability, yet they often lack the necessary skills and expertise to effectively execute their work. Consequently, ascertaining the state of students' attitudes regarding environmental matter can facilitate the implementation of

sustainable practices and products, as well as enable the development of education that is appropriate for the context (Ashour et al., 2021).

Numerous investigations have been carried out to examine the perspectives of students towards sustainability (Ruff & Olson, 2009; Ull et al., 2014; Tang, 2018), the attitudes of interior designers towards sustainable interior design practices (Bacon, 2011; Stark & Gyu, 2016), the factors influencing student attitudes (Beery, 2013), and the influence of educational programs in interior design on attitudes regarding sustainable design and education in collaboration (Gale et al., 2014). Ahin and Erkal (2017) as well as Nousheen et al. (2020) few studies has been carried out on the viewpoints of students with respect to sustainability.

The extent of environmental concern among students in the interior design programmer was assessed by Ruff and Olson through a poll of 95 participants. The outcomes were evaluated using a adjusted version of the New Environmental Paradigm (NEP) scale. The present scale is designed to assess the degree of self-efficacy of participants in executing sustainable interior design techniques in practical applications. The results show that in spite of receiving education on environmental sustainability, a considerable proportion of the student population held the belief that natural systems could be indefinitely restored. The inquiry has been conducted by scholars to determine whether the responsibility of preparing for sustainability lies with educators, rather than presuming that pupils would spontaneously embrace this impression in their design assignments (Ruff & Olson, 2009). The aforementioned outcome emphasizes the necessity of experimental evidence to substantiate the efficacy of educational initiatives that priorities sustainable design.

Bacon conducted a study on the attitudes of interior designers regarding environmentally responsible interior design practices and the barriers that must be overcome to address environmental concerns. The classification of the categories was organized into five distinct groups, which encompassed safeguarding the natural resources of the land, advocating for the adoption of ecologically sustainable practices in interior design, enhancing the well-being of the populace, and optimizing the building's orientation and accessibility. The execution of environmentally responsible practices in interior design poses challenges that can be categorized into three distinct areas: project skills, transitioning to sustainability, and knowledge and abilities pertaining to environmentally responsible design. There was a widespread prevalence of favorable attitudes towards interior design approaches that priorities environmental responsibility. The findings indicate a correlation between attitudes and anticipated obstacles, implying that a favorable attitude played a

role in the effective resolution of sustainable interior design-related challenges.

Beery conducted a study to evaluate the degree of sustainability awareness exhibited by university students and to gauge their engagement in sustainable practices that promote environmental and social responsibility. Beery's research findings suggest that the remarks made by interviewees indicate that the activities in which students participate during their academic tenure have a dual effect on their perception of sustainable living. The research results indicate that education can serve as a viable approach to enhance awareness and promote favorable conduct (Beery, 2013).

Gale et al. carried out a study utilizing a social constructivist framework to examine the variation in collaborative learning attitudes among interior design students at different educational levels (lower and higher). The study also aimed to evaluate the potential influence of interior design education on their attitudes regarding design through the lens of sustainable and collaborative learning. The findings indicate that students at the higher academic level exhibited a greater inclination towards sustainable design, as compared to their counterparts at the lower academic level, as reflected in their "positive attitudes". The investigators observed a correlation between the two variables. However, the findings indicated that students at the higher academic level held less favorable attitudes towards collaborative learning in comparison to their counterparts at lower academic levels. The researcher has highlighted the significance of incorporating collaborative learning with sustainable design education in the realm of interior design pedagogy to augment the career achievements of forthcoming learners (Gale et al., 2014).

The study conducted by Şahin and Erkal aimed to examine and compare the attitudes of students majoring in "child development" and "social work" towards environmental sustainability. The researchers analyzed five distinct aspects of these attitudes, namely: 1) recognition of environmental problems; 2) insensitivity towards environmental problems; 3) adoption of recycling practices for environmental sustainability; 4) negative perceptions towards a sustainable environment; and 5) recognition of the significance of a sustainable environment. The research results indicate that students pursuing a degree in "child development" exhibited a greater degree of environmental sensitivity compared to their counterparts pursuing a degree in "social work." Furthermore, the level of environmental awareness demonstrated by the former group was found to be positively correlated with their educational attainment and knowledge. According to Ahin and Erkal's (2017) study, it has been established that rapid fluctuations in environmental knowledge pose

a challenge that warrants attention, and it is recommended that such changes be integrated into the academic programmer of universities.

3. METHODOLOGY

The methodology used to address the research objectives and respond to the research questions are described in this section of the study. The sections that follow provide an overview of the different parts of the research methodology, such as data collection, instrument development, data analysis techniques, study sample, research limitations, and the strategy for future research.

3.1 Research Objectives

1-To achieve a level of comprehension regarding the sustainable design practices that are utilized in the context of interior design projects.

2-To explore the perspectives of students regarding environmental sustainability. This will be achieved by evaluating their level of concern for the environment through an updated version of the NEP, as well as investigating their confidence in utilizing sustainable design methods in interior design projects. Previous research conducted by Ruff and Olson (2009) and Sahin and Erkal (2017) will be utilized in this exploration.

Examine the influence academic year affects students' perceptions of sustainable design (Ruff & Olson, 2009; Gale et al., 2014).

3.2 Search Questions

1- What is the degree of concern for the environment among students enrolled in the Intermediate Associate Degree Program within the Department of Interior Design and Decorative Art at Al-Balqa’ Applied University's Irbid College Faculty?

2- To what extent do students of interior design at Al-Balqa' Applied University - Faculty of Irbid College incorporate sustainable products and solutions in their interior design scenarios?

3- What are the possible impacts of different levels of interior design education on students' attitudes towards sustainable design? The present study aims to investigate whether there exist statistically significant variations in the environmental interest and usage of eco-friendly products and solutions in interior design scenarios among Al-Balqa' Applied University- Faculty of Irbid College interior design students, based on their year level.

The study employed a questionnaire chosen by Ruff and Olson (2009) for the purpose of conducting field research. Nevertheless, specific modifications were implemented to the survey instrument to ensure its efficacy within the context of the research. The initial stage of the

procedure involved the distribution of a survey to a cohort of experts operating within the domains of interior design and statistics. The subsequent stage of the procedure involved the distribution of a survey to a cohort of pupils and the acquisition of their corresponding answers. As a result of these two procedures, it was possible to verify the comprehensibility of both the linguistic and presentational aspects. Throughout these stages, several recommendations were put forward regarding both the comprehensive array of inquiries and the structural arrangement of the responses. In response to the received feedback, certain inquiries pertaining to environmentally beneficial actions were amalgamated with queries exploring the correlation between interior design and environmental sustainability.

3.3 Data Collection

The information was gathered by means of an online questionnaire administered in classrooms, which had questions in Arabic. During the first academic semester of the 2021-2022 school year, the questionnaire was sent to all of the Associate Degree Program students majoring in Interior design and decoration arts who were enrolled at Al-Balqa' Applied University- Faculty of Irbid College.

The population of female interior design students attending Al-Balqa' Applied University's Faculty of Irbid College served as the basis for the selection of the sample for this research, which consisted of 82 students total. It was determined to use a stratified sample according to the year level (1-first year of specialization; 2-second year of specialization). The variable of year level has the potential to influence both the prevalent level of knowledge and the attitudes of the pupils.

3.4 Instrumentation and questionnaire development

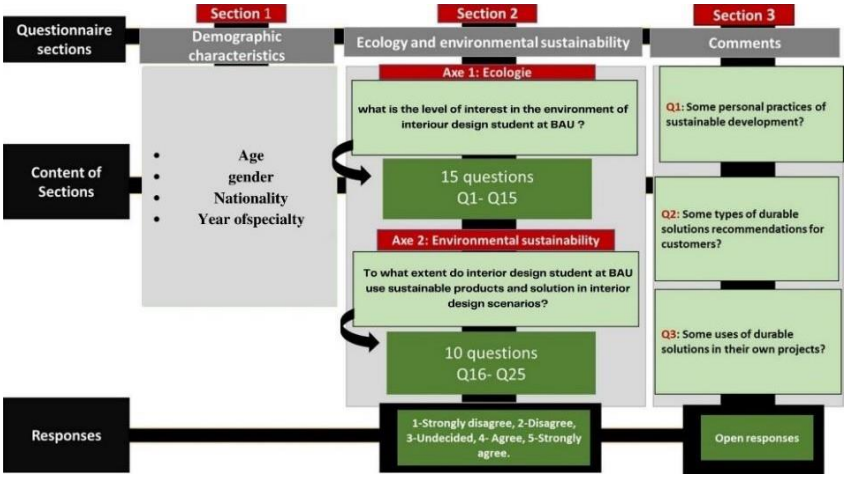
The questionnaire comprises three distinct sections, namely: (1) demographic information, (2) ecological and environmental sustainability, and (3) comments, as illustrated in Figure 2. In the initial section, respondents were requested to furnish additional demographic and societal information, such as their age, country of origin, degree of expertise, and year of specialization (1, 2).

In the study conducted by Dunlap et al. (2000), the ecological attitude was assessed in the first axis of the second section of the questionnaire comprising 15 questions, using a revised version of the New Ecological Paradigm (NEP) environmental model.

A survey was conducted by NEP, utilizing the original version from 1978, with the aim of comparing the environmental attitudes of American students. The objective of the present study was to assess the degree to which participants endorse an ecological worldview (Ruff & Olson, 2009). Dunlap and his associates have made modifications to the NEP scale by introducing a novel environmental model scale that amalgamates 15 distinct elements (Dunlap et al.,

2000). According to Dunlap et al. (2000), the revised NEP is a more comprehensive measurement instrument than the initial scale as it encompasses the essential aspects of ecological perspective in a more thorough manner, while retaining its original purpose. Dunlap et al.'s research indicates that the measure was identified as the most suitable predictive tool for environmental perspectives.

Figure 2. The structure of the questionnaire as well as its development.



Participants were requested to rate their degree of concurrence for every term on a five-point Likert scale. Subsequently, the NEP rate was derived from the participants' responses and rated on a 5-point scale. The responses that garnered the highest scores were indicative of a stronger inclination towards pro-environmental attitudes. Furthermore, the second dimension of the survey's subsequent segment assessed the perspectives of pupils regarding ecological sustainability, comprising ten inquiries. The respondents utilized a 5-point Likert scale to evaluate the terms.

During the "Comments" section, which comprised of five open-ended questions, participants engaged in a discourse on the subject of environmental sustainability. 1) Through the exploration of personal environmentally sustainable practices, 2) By providing recommendations for sustainable solutions that can be implemented by their prospective clients, and 3) By incorporating sustainable solutions into their design projects.

3.5 Data Analysis Procedures

for research goals, the data underwent analysis through the utilization of the Statistical Package for Social Sciences (SPSS) software. The results of the analysis are presented below:

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- The study employs the use of repetition and percentages to delineate the attributes of the research sample.
- Monovariate analysis, also known as one-way ANOVA, is a statistical method utilized to assess the significance of variations among multiple groups.

3.6 Study Sample

The traits of the students who responded to the survey are distributed in Table 1 as follows: 82 of the 92 target students at Al-Balqa' Applied University are majoring in interior design. 90% of the target population was represented by the participants, of which 86.59% were Jordanian and 13.41% were from other Arab countries (4.88% were Syrian, 2.44% were Palestinian, 3.65% were Egyptian, and 2.44% were Yemeni). The respondents' ages ranged from 19 to 25 years, with a 22-year-old average and a 21-year-old median. According to the data, out of the 82 students who responded, 52.44% were registered at first year of specialization and 47.56% at second year of specialization. Because they were enrolled in various levels of interior design studios, it should be noted that these students had variable degrees of knowledge and expertise in relation to various areas of environmental sustainability.

3.7 Limitations of the search

First of all, the participants were all female college students who studied interior design at Al-Balqa' Applied University. Future research should involve male participants from related fields like architecture. Second, the participants were college students. Even if the university is one of the most prestigious in the nation, further research should also use samples from other public and private universities.

Table 1 shows the distribution of students based on their distinguishing characteristics.

Variables	Groups	Number of Students	Percentage %
Age	19	9	10.97
	20	20	24.39
	21	25	30.49
	22	8	9.76
	23	11	13.41
	24	7	8.54
	25	2	2.44
Nationality	Jordanian	71	86.59
	~~Syrian~~	4	4.88

	~~Palestinian~~	2	2.44
	~~Egyptian~~	3	3.65
	~~Yemeni~~	2	2.44
Year of Speciality	First	43	52.44
	Second	39	47.56
Total		82	100

4. Results

This section presents the results of the study, which were obtained through the administration of questionnaires. Table 2 presents the results of the computation of means and standard deviations, as well as the approval grades of the sample with respect to environment-related phrases. These computations were conducted to address the initial inquiry on the evaluation of the interest of Al-Balqa' Applied University's interior design students in the environment.

The findings are presented in descending order of mean values, signifying a comparatively less optimistic perspective. According to Table 2, the average level of environmental interest among interior design students at Al-Balqa' Applied University ranged from 1.61 to 4.82. The statement (6) that conveys a negative sentiment, "The earth possesses sufficient natural resources, provided we acquire the knowledge to utilize them," obtained the highest average score of 4.82. Conversely, the statement (5) that expresses a positive sentiment, "Humans are causing significant harm to the environment," received the lowest average score of 1.61. The graph indicates that the students of interior design at Al-Balqa' Applied University exhibit a notable degree of concern for the environment, as evidenced by the moderate level of acceptance and the overall number of statements, which is at an average level of 3.23.

Table 2. Means and standard deviations of replies on the environment's interest among Al-Balqa' Applied University interior design students.

No.	Statements	Means	SD	Level	Order
6	The earth is rich in natural resources if we only learn how to develop them.	4.82	0.387	V. Large	1
7	Plants and animals possess an equal entitlement to coexist with humans.	4.79	0.456	V. Large	2
15	If things continue on their current path, we will soon face a major ecological disaster.	4.42	0.733	V. Large	3

9	Notwithstanding their exceptional capabilities, human beings remain subject to the laws of nature.	3.86	0.871	Large	4
4	The inventiveness of humanity will prevent us from making the planet uninhabitable.	3.41	1.162	Moderate	5
11	The planet Earth can be likened to a spacecraft that possesses a finite capacity in terms of space and resources.	3.39	1.088	Moderate	6
1	We are reaching the maximum amount of people that the earth can support.	3.33	0.907	Moderate	7
8	Nature's equilibrium is powerful enough to withstand the effects from modern industrial countries.	3.31	1.101	Moderate	8
2	Humans have the right to alter nature to suit their needs.	3.29	1.179	Moderate	9
3	When humans interfere with nature, the results are frequently disastrous*.	2.65	1.092	Moderate	10
10	The extent of the ecological crisis that humanity is currently facing has been overstated.	2.56	1.143	Small	11
13	The equilibrium of the natural world is highly intricate and susceptible to disruption.	2.42	0.959	Small	12
14	It is postulated that humanity will acquire a sufficient understanding of natural phenomena to exercise control over it.	2.41	0.806	Small	13
12	Humans are meant to rule over the rest of nature.	2.11	0.872	Small	14
5	The environment is suffering from severe abuse at the hands of humans.	1.61	0.597	V. Small	15
	Total	3.23	0.237	Moderate	

Table 3 presents the precise mean responses of the sample regarding the level of acceptance. Table 4 presents the results of the second inquiry pertaining to the assessment of the utilization of ecologically sustainable materials and procedures in the context of interior design scenarios. The table includes the calculation of means and standard deviations, as well as the ranking of the participants' degree of concurrence with these practices. In the second phase, the researchers considered and categorized open responses.

Table 3. Average replies from the sample's participants to the level of approval

Mean	Level
4.2<	V. Large
From 3.4 to 4.2	Large
From 2.6 to 3.4	Moderate
From 1.8 to 2.6	Small
<1.8	V, Small

The survey results indicate that the statement (20) expressing the willingness to construct a house using sustainable methods had the highest average score. Conversely, the statement (24) claiming the ability to persuade clients of the value of sustainable features had the lowest average score, with a mean value of 4.63. As indicated in Table 4, the mean acceptance ratings of the sample with regard to the utilization of environmentally sustainable materials and solutions in interior design initiatives exhibited a range of 3.03 to 4.63. The data presented in the table indicates that the general feedback garnered a significant level of approval, with an average score of 4.19. This underscores the significance of incorporating sustainable materials and approaches in the context of interior design scenarios. With respect to the preliminary responses, a majority of 84.6% of participants provided feedback on their respective environmental sustainability policies, whereas a minority of 15.4% opted not to do so. The results revealed the identification of three distinct types of practice.

- Regular practices that aim to conserve energy and water resources through the implementation of recycling, reduction, and reuse strategies for a diverse range of materials and commodities.
- The customary procedures employed in the interior design studio entail the utilization of ecologically sustainable materials, conceptual frameworks that minimize energy consumption, and eco-friendly design alternatives.
- This pertains to the study of social behaviors that aim to promote knowledge dissemination, education on the importance of environmental sustainability, and the selection of eco-friendly resources. A proportion of 14.6% of the respondents opted to abstain from answering the subsequent inquiry pertaining to suggestions for sustainable solutions aimed at users. The question received a response rate of 85.4% from the participants.

The study's results indicate that the reliable solutions recommended by customers were associated with a total of five concepts:

- Energy.
- Utilizing water.
- The integration of the external environment with the interior of a dwelling, alongside the implementation of verdant surfaces, the allocation of designated spaces for waste management, the exploration of environmental control systems that align with ecological requirements, the utilization of natural lighting and ventilation, the utilization of regional resources, the utilization of sustainable raw materials, and the conceptualization of enlarged windows to optimize natural illumination, among other strategies, are all crucial elements of environmentally conscious design.
- The tensile strength of the materials, their non-toxic and natural properties that facilitate recycling, the raw materials employed, and the treatment methods utilized, etc.
- Reusing used furniture.

Table 4: shows the averages and ranges of responses to scenarios involving the use of environmentally friendly materials and concepts in interior design.

No.	Statements	Means	SD	Level	Order
20	Given the chance, I would construct my dwelling utilizing sustainable techniques.	4.63	0.526	V. Large	1
16	I believe I could complete an interior design project using environmentally friendly techniques.	4.52	0.593	V. Large	2
25	It is my belief that the integration of 'Cradle to Cradle' principles should be mandatory within the curriculum of an interior design program.	4.45	0.591	V. Large	3
17	I believe I could complete an interior design project with environmentally friendly materials.	4.36	0.719	V. Large	4
23	In the event of a request, I possess the ability to guide a customer towards a sustainable and practical design.	4.31	0.712	V. Large	5
22	If a client asked, I could point them to a sustainable building in commercial design.	4.19	0.729	Large	6
21	In the event of a request, I possess the ability to guide a customer towards a house that adheres to sustainable building practices.	4.17	0.771	Large	7
18	I feel Green organizations and certifications, will address environmental design issues.	4.12	0.742	Large	8

19	I believe there is no justification for making sustainable design practices optional.	3.88	0.896	Large	9
24	I am knowledgeable enough to justify the additional cost of sustainable features to clients.	3.03	0.893	Moderate	10
	Total	4.16	0.237	Large	

The results indicated that a majority of the participants (58.3%) reported utilizing sustainable solutions in their design projects, whereas a significant proportion of the respondents (41.7%) chose to remain silent when questioned about their usage of sustainable solutions in their work.

According to their interest in the environment and how much they employed environmentally friendly items and solutions in interior design scenarios, Al-Balqa' Applied University interior design students' replies were averaged and standard deviations were determined; the findings are as presented in Table 5.

Table 5, displays the means and standard deviations of the responses provided by students, categorized by their year level. The responses pertain to the level of interest exhibited by the students towards the environment, as well as their inclination towards the utilization of sustainable products and solutions in interior design scenarios.

Table 5

Axis	**Year of specialty and studio level**	**Number of Students**	**Mean**	**SD**
Level of interest in the environment	1st year of speciality	43	3.27	0.215
	2nd year of speciality	39	3.22	0.249
Implementation of environmentally responsible practises, materials, and technologies into interior design	1st year of speciality	43	3.99	0.476
	2nd year of speciality	39	4.27	0.399

A single variance analysis was conducted to determine the significance of the differences in students' responses regarding their level of environmental concern and the frequency of their use of sustainable products and solutions in the context of interior design.

Table 6. Test analysis

Axis	Source of Contrast	Total number of squares	Degrees of freedom	Average squares	Value (D)	Level of significance
Interest in the environment	Between groups	0.062	2	0.031	0.569	0.589
	Within groups	4.033	79	0.056		
	Total	4.095	81			
Implementation of environmentally responsible practises, materials, and technologies into interior design	Between groups	0.873	2	0.439	2.506	0.096
	Within groups	13.31	79	0.186		
	Total	14.18	81			

Table 6 illustrates that there were no significant fluctuations across years in the mean responses of interior design students at Al-Balqa' Applied University with regard to their degree of environmental concern and the extent to which they incorporated interior design sustainable products and solutions contexts. The findings indicate that the level of concern among interior design students at Al-Balqa' Applied University regarding environmental issues, as well as their implementation of sustainable techniques and materials in their projects, exhibit fluctuations across different academic years.

5. Discussion

The results obtained from the study demonstrate a significant level of environmental awareness and concern among students pursuing interior design at Al-Balqa' Applied University. A comprehensive examination of the data gathered from the distributed surveys reveals a moderate degree of receptiveness and enthusiasm towards expressions related to ecological concerns, indicating the active involvement of the students in such topics. The aforementioned results are consistent with previous studies that have emphasized the importance of evaluating student attitudes regarding sustainability, acknowledging the crucial influence that students, as prospective decision-makers, hold (Fu et al., 2017; Ahamad & Ariffin, 2018; Janmaimool & Khajohnmanee, 2019).

A significant discovery arising from this research concerns the maximum mean value obtained for the statement articulating a pessimistic attitude towards the earth's ability to maintain its ecological resources. The present discovery aligns with the investigation carried out by Ruff and Olson (2009), which highlighted

the widespread perception among pupils that ecological systems can be restored limitlessly, even after being educated on the principles of environmental sustainability. The aforementioned findings emphasize the urgent necessity for ongoing educational efforts that target the correction of misunderstandings and the promotion of a more accurate comprehension of the limited availability of resources.

Furthermore, the research highlights a significant degree of acknowledgement and implementation of ecologically sustainable materials and approaches in interior design endeavors among the enrolled students. The present discovery is consistent with the investigation conducted by Bacon (2011), which recognized positive perceptions towards ecologically responsible practices in the field of interior design. The findings underscore the positive perspective of students in the field of interior design at Al-Balqa' Applied University, revealing their readiness to integrate sustainable materials and solutions into their design projects.

The research outcomes are consistent with the current body of literature regarding the influence of education on student attitudes. According to Gale et al. (2014), there is a positive correlation between higher-level interior design students and their inclination towards sustainable design. This highlights the significant impact of education on shaping individuals' attitudes. The research carried out by Şahin and Erkal (2017) highlighted the existence of a favorable association between environmental consciousness, responsiveness, and academic accomplishment. The results of this study emphasize the importance of incorporating sustainability education into interior design curricula as a means of promoting favorable attitudes and behaviors among students.

6. Conclusion and future research

The present study makes a noteworthy contribution to the extant literature by providing a thorough examination of the perspectives of students pursuing interior design at Al-Balqa' Applied University with regards to environmental sustainability. The results emphasize the significant role of education in advancing sustainable practices and molding the perspectives of learners. The findings provide strong support for the need to continue implementing initiatives that address misunderstandings, enhance understanding, and cultivate favorable dispositions among students of interior design. The effective integration of sustainability principles into the education and training of upcoming designers can empower them to play a crucial role in promoting environmentally conscious design practices within the industry.

Moreover, this study lays the groundwork for possible future research endeavors. A prospective research direction could entail a longitudinal investigation into the effects of sustainability education on the attitudes and conduct of interior design students over a protracted duration. Furthermore, investigating the effectiveness of particular educational interventions or programs in augmenting students' understanding and cultivating favorable dispositions towards sustainability would constitute a productive avenue of inquiry. Finally, an examination of the obstacles and prospects encountered by interior design professionals when incorporating sustainable design methodologies can furnish significant perspectives for both academic institutions and industry experts.

Bibliography

Kibert, C. J. (2016). Sustainable construction: green building design and delivery. John Wiley & Sons.

Steinfeld, E., & Maisel, J. (2012). Universal design: Creating inclusive environments. John Wiley & Sons.

3Moubarak, L. M., & Qassem, E. W. (2018). Creative eco crafts and sustainability of interior design: Schools in Aswan, Egypt as a case study. The Design Journal, 21(6), 835-854.

Bumgardner, M. S., & Nicholls, D. L. (2020). Sustainable practices in furniture design: A literature study on customization, biomimicry, competitiveness, and product communication. Forests, 11(12), 1277.

Mate, K. I. R. S. T. Y. (2009). Attitudes versus actions: are interior designers genuinely embracing sustainable design through material selection?. In 5th International Conference of the Association of Architecture Schools in Australasia (pp. 1-9).

Zhang, D., & Tu, Y. (2021). Green building, pro-environmental behavior and well-being: Evidence from Singapore. Cities, 108, 102980.

Khalili, N. R., Duecker, S., Ashton, W., & Chavez, F. (2015). From cleaner production to sustainable development: the role of academia. Journal of Cleaner Production, 96, 30-43.

Alves, F., Nicolau, L. B., Lima, D., Azeiteiro, U. M., & Nicolau, P. B. (2018). University student's perceptions about climate change: The case of Interior Design and Architecture students of a Brazilian University. In Handbook of Climate Change Communication: Vol. 2 (pp. 183-203). Springer, Cham

Brundiers, K., & Wiek, A. (2017). Beyond interpersonal competence: Teaching and learning professional skills in sustainability. Education Sciences, 7(1), 39.

King, A. (2015). Urbanism, colonialism, and the world-economy. Routledge.

Chen, J. C., & Martin, A. R. (2015). Role-play simulations as a transformative methodology in environmental education. Journal of Transformative Education, 13(1), 85-102.

Herranen, J., Vesterinen, V. M., & Aksela, M. (2018). From learner-centered to learner-driven sustainability education. Sustainability, 10(7), 2190.

Alm, K., Beery, T. H., Eiblmeier, D., & Fahmy, T. (2022). Students' learning sustainability–implicit, explicit or non-existent: a case study approach on students' key competencies addressing the SDGs in HEI program. International Journal of Sustainability in Higher Education.

Stark, J., & Gyu, J. (2016). Interior design students perceptions of sustainability. International Journal of Sustainability in Higher Education.

Ashour, A. F. (2020). Design responsibility and sustainability in education. International Journal of Design & Nature and Ecodynamics, 15(1), 129-133.

McCoy, J. (2012). Sustainability: Environmentally Responsible Interior Design. Journal of Interior Design, 37, 5-6.

Dokter, G., Thuvander, L., & Rahe, U. (2021). How circular is current design practice? Investigating perspectives across industrial design and architecture in the transition towards a circular economy. Sustainable Production and Consumption, 26, 692-708.

Hayles, C. S. (2015). Environmentally sustainable interior design: A snapshot of current supply of and demand for green, sustainable or Fair Trade products for interior design practice. International Journal of Sustainable Built Environment, 4(1), 100-108.

Ching, F. D., & Binggeli, C. (2018). Interior design illustrated. John Wiley & Sons.

Lee, E., Allen, A., & Kim, B. (2013). Interior design practitioner motivations for specifying sustainable materials: Applying the theory of planned behavior to residential design. Journal of Interior Design, 38(4), 1-16.

Council for Interior Design Accreditation (CIDA) (2019). Professional Standards 2018.http://www.accredit-id.org/professional-standards

Jiang, P., Dieckmann, E., Han, J., & Childs, P. R. (2021). A bibliometric review of sustainable product design. Energies, 14(21), 6867.

Suárez, L., & Domínguez, M. (2020). Sustainability and environmental impact of fused deposition modelling (FDM) technologies. The International Journal of Advanced Manufacturing Technology, 106(3), 1267-1279.

Lechner, N. (2014). Heating, cooling, lighting: Sustainable design methods for architects. John wiley & sons.

Russell-Smith, S. V., Lepech, M. D., Fruchter, R., & Meyer, Y. B. (2015). Sustainable target value design: integrating life cycle assessment and target value design to improve building energy and environmental performance. Journal of Cleaner Production, 88, 43-51.

Kibert, C. J. (2016). Sustainable construction: green building design and delivery. John Wiley & Sons.

Ashour, M., Mahdiyar, A., & Haron, S. H. (2021). A Comprehensive Review of Deterrents to the Practice of Sustainable Interior Architecture and Design. Sustainability, 13(18), 10403.

Obeidat, Islam. "An examination of learning and application of sustainability principles in a collaborative setting." PhD diss., 2013.

Rashdan, W., & Ashour, A. F. (2017). Criteria for sustainable interior design solutions. WIT Transactions on Ecology and the Environment, 223, 311-322.

Luederitz, C., Schäpke, N., Wiek, A., Lang, D. J., Bergmann, M., Bos, J. J., ... & Westley, F. R. (2017). Learning through evaluation–A tentative evaluative scheme for sustainability transition experiments. Journal of Cleaner Production, 169, 61-76.

Karunathilake, H., Hewage, K., Mérida, W., & Sadiq, R. (2019). Renewable energy selection for net-zero energy communities: Life cycle based decision making under uncertainty. Renewable energy, 130, 558-573.

Geng, Y., Ji, W., Wang, Z., Lin, B., & Zhu, Y. (2019). A review of operating performance in green buildings: Energy use, indoor environmental quality and occupant satisfaction. Energy and Buildings, 183, 500-514.

Zhang, Y., Wang, J., Hu, F., & Wang, Y. (2017). Comparison of evaluation standards for green building in China, Britain, United States. Renewable and sustainable energy reviews, 68, 262-271.

Kylili, A., & Fokaides, P. A. (2017). Policy trends for the sustainability assessment of construction materials: A review. Sustainable Cities and Society, 35, 280-288.

Chen Austin, M., Garzola, D., Delgado, N., Jiménez, J. U., & Mora, D. (2020). Inspection of biomimicry approaches as an alternative to address climate-related energy building challenges: A framework for application in Panama. Biomimetics, 5(3), 40.

Akadiri, P. O., Chinyio, E. A., & Olomolaiye, P. O. (2012). Design of a sustainable building: A conceptual framework for implementing sustainability in the building sector. Buildings, 2(2), 126-152.

Çeliker, A. (2017). Sustainable housing: A conceptual approach. Open House International.

Demirkan, H., & Afacan, Y. (2018). Setting the key issues and a prioritization strategy for designing sustainable interior environments. METU Journal of the Faculty of Architecture, 35(1), 201-219.

Giannelloni, J. L. (1998). Les comportements liés à la protection de l'environnement et leurs déterminants: un état des recherches en marketing. Recherche et Applications en Marketing (French Edition), 13(2), 49-72.

Fu, L., Zhang, Y., & Bai, Y. (2017). Pro-environmental awareness and behaviors on campus: Evidence from Tianjin, China. Eurasia Journal of Mathematics, Science and Technology Education, 14(1), 427-445

Ahamad, N. R., & Ariffin, M. (2018). Assessment of knowledge, attitude and practice towards sustainable consumption among university students in Selangor, Malaysia. Sustainable Production and Consumption, 16, 88-98.

Janmaimool, P., & Khajohnmanee, S. (2019). Roles of environmental system knowledge in promoting university students' environmental attitudes and pro-environmental behaviors. Sustainability, 11(16), 4270.

De los Rios, I. C., & Charnley, F. J. (2017). Skills and capabilities for a sustainable and circular economy: The changing role of design. Journal of Cleaner Production, 160, 109-122.

Ashour, M., Mahdiyar, A., & Haron, S. H. (2021). A Comprehensive Review of Deterrents to the Practice of Sustainable Interior Architecture and Design. Sustainability, 13(18), 10403.

Ruff, C. L., & Olson, M. A. (2009). The attitudes of interior design students towards sustainability. International Journal of Technology and Design Education, 19(1), 67-77.

Tang, K. H. D. (2018). Correlation between sustainability education and engineering students' attitudes towards sustainability. International Journal of Sustainability in Higher Education.

Ull, M. A., Martínez-Agut, M. P., Piñero, A., & Aznar-Minguet, P. (2014). Perceptions and attitudes of students of teacher-training towards environment and sustainability. Procedia-Social and Behavioral Sciences, 131, 453-457.

Bacon, L. (2011). Interior designer's attitudes toward sustainable interior design practices and barriers encountered when using sustainable interior design practices.

Stark, J., & Gyu, J. (2016). Interior design students perceptions of sustainability. International Journal of Sustainability in Higher Education.

Beery, T. (2013). Making sustainable behaviors the norm at the University of Minnesota Duluth. Journal of Sustainability Education, 5, 345-355.

Gale, A. J., Martin, D., Martin, K., & Duffey, M. A. (2014). The burnout phenomenon: A comparative study of student attitudes toward collaborative learning and sustainability. Journal of Interior Design, 39(1), 17-31.

Şahin, H., & Erkal, S. (2017). An Investigation of University Students' Attitudes Toward Environmental Sustainability. European Journal of Sustainable Development, 6(4), 147-147

Nousheen, A., Zai, S. A. Y., Waseem, M., & Khan, S. A. (2020). Education for sustainable development (ESD): Effects of sustainability education on pre-service teachers' attitude towards sustainable development (SD). Journal of Cleaner Production, 250, 119537.

Beery, T. (2013). Making sustainable behaviors the norm at the University of Minnesota Duluth. Journal of Sustainability Education, 5, 345-355.

Şahin, H., & Erkal, S. (2017). An Investigation of University Students' Attitudes Toward Environmental Sustainability. European Journal of Sustainable Development, 6(4), 147-147.

Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). New trends in measuring environmental attitudes: measuring endorsement of the new ecological paradigm: a revised NEP scale. Journal of social issues, 56(3), 425-442.