Deanship of Scientific Research

Design Studio Pedagogy: A Comparative Study of Teaching Approaches

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Abstract

Objectives: This study presents a comparative analysis of various teaching methodologies within design studio instruction, focusing on their impact on student learning outcomes, creativity, and problem-solving skills.

Methods: Utilizing both quantitative and qualitative research methods, the study includes a student survey and interviews with faculty members.

Results: The results, derived from a comprehensive survey of 100 students from universities in Bahrain, reveal a positive perception of design studios. Interviews with instructors highlight the strengths and challenges inherent in different teaching methods. Traditional lectures are effective in conveying fundamental knowledge, whereas project-based learning, design thinking, collaborative learning, and experiential learning prioritize hands-on experiences, real-world applications, and innovation.

Conclusion: The study identifies challenges such as technological issues and resource constraints, and proposes tailored teaching methods, enhanced engagement, resource provision, and professional development as mitigation strategies. This research provides valuable insights into the effectiveness of various educational approaches and offers recommendations for improving design studio education and addressing challenges to enhance the overall educational experience.

Keywords: Design Studio Pedagogy; Teaching Approaches; Comparative Study.

منهج استوديو التصميم: دراسة مقارنة لطرق التدريس

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ملخّص

الأهداف: تقدم هذه الدراسة تحليلاً مقارنًا لمناهج التدريس المتنوعة ضمن أساليب التدريس في استوديو التصميم، مع التركيز على آثارها على نتائج تعلم الطلاب والإبداع ومهارات حل المشكلات.

المنهجية: باستخدام أساليب البحث الكمية والنوعية، يشتمل البحث على استبيان للطلاب ومقابلات مع أعضاء هيئة التدريس.

النتائج: تكشف النتائج المستمدة من استطلاع شامل، شمل 100 طالب من جامعات البحرين عن تصور إيجابي لاستوديوهات التصميم. تسلط المقابلات التي أجراها المعلمون الضوء على نقاط القوة والتحديات الكامنة في طرائق التدريس المختلفة. تعتبر المحاضرات التقليدية فعالة في نقل المعرفة الأساسية، في حين أن التعلم القائم على المشاريع، والتفكير التصميمي، والتعلم التعاوني، والتعلم التجريبي يعطي الأولوية للتجارب العملية والتطبيقية والتطبيقات الواقعية والابتكار.

الخلاصة: وتحدد الدراسة التحديات مثل القضايا التكنولوجية وقيود الموارد، وتقترح أساليب التدريس مصممة خصيصا، وتعزيز المشاركة، وتوفير الموارد والتطوير المهني كاستراتيجيات للتخفيف. يساهم هذا البحث برؤى قيمة حول فعالية الأساليب التربوية المختلفة، ويقدم توصيات لتحسين تعليم استوديو التصميم ومعالجة التحديات لتعزيز التجربة التعليمية الشاملة.

الكلمات الدالة: منهج استوديو التصميم، طرائق التدريس، دراسة مقارنة

Introduction

Design studio pedagogy is a collaborative approach to teaching in higher education that emphasizes creativity, design thinking, and active learning. It aligns with constructive alignment and project-based learning theories, which provide a solid foundation for student engagement and success. In this dynamic educational setting, students are encouraged to explore their own unique perspective and cultivate critical thinking skills (Guaman-Quintanilla et al.2023). Design studio pedagogy combines design practices and theories, emphasizing both understanding and experience. Making is essential to learning design. Furthermore, design studio pedagogy requires a shift in the traditional learning focus, as it promotes the development of practical skills and the application of theoretical knowledge. By integrating research and innovation in teaching approaches, educators can inspire their students and equip them with the necessary tools to tackle complex real-world challenges (Lotfabadi and Iranmanesh 2024; El Marsafawy et al., 2020).

The design studio pedagogy goes beyond traditional teaching methods and offers a holistic approach to education. It empowers students to become active participants in their learning journey and encourages them to think innovatively. It is through this transformative educational experience that students can make a positive impact in the world around them (Hettithanthri and Hansen, 2022).

Study Questions

This study seeks to address the need for a comprehensive examination of teaching approaches in design studio pedagogy. By conducting a comparative analysis, it aims to shed light on the strengths and weaknesses of various methods, ultimately informing best practices in design education. This research contributes to the ongoing dialogue among design educators, helping to refine pedagogical strategies and enhance the learning experiences of design students.

1.   How do various design studio teaching approaches impact student learning outcomes, creativity, and problem-solving skills?

2.   What are the perspectives of both instructors and students regarding the effectiveness of these teaching approaches.

Background

In design education, selecting an appropriate teaching approach is crucial for the delivery of course content. Different teaching approaches in design education take into account the aspects of the curriculum, the actual making process, and the issue of how knowledge and skills are being taught and assessed. As Cross (2023) suggested, teaching in the field of art and design, with the emphasis on creativity, requires a distinctive approach which is quite different from the subject such as science where traditional lecture-based teaching is commonly used. Design education is more than the provision of practical skills. It is about development of critical thinking and a body of knowledge. Therefore, we have seen a number of researches propose on different teaching strategies which best serve the objectives of fostering creativity and critical analysis in design education. For example, scholars such as Ulger (2018). and Lynas, Budge, & Beale (2013) advocated that the implementation of a more student-centred approach in the teaching and learning process would provide an essential support in exploration and discussion of the diversity of design ideas. Ulger (2018) suggested that to make the students most productive, a creative and interactive environment should be established, and teacher should adopt the role as mentor where the creativity of the individual student in the making process can be enhanced. This view echoes to what González-Salamanca et al., (2020) proposed, where a well-designed physical environment of a design studio would better facilitate a particular form of learning and teaching practice, and the attributes required for the learning and teaching space in the art and design subject area are flexibility, informality and openness. As Cross (2023) indicated that creative behaviour is visible and exposed to continuous, critical assessment through a multiple-step making activities. Such kind of exposure, if it being emphasised as a critical aspect for a successful knowledge transfer, would in turn cultivate the student's practical and critical problem-solving ability. It appears that, these researches are largely focused on the creation of a new domain of knowledge or the use of digital technology to support the learning and teaching process in design education. But little work has been done to compare the benefits and drawbacks between traditional teaching approaches and the emerging teaching strategies that leveraging on the use of digital technology, or the investigation on the influence of established physical environment

on a particular teaching practice in design studio.

Previous Research on Design Studio Pedagogy

The background information is of utmost importance for the study at hand, as it provides a concise overview of what design pedagogy entails. According to Tesar (2021) design pedagogy can be outlined in three distinct ways: the philospher's manner, the methodologies manner, and finally, the professed manner. Expanding on this aspect, it is worth noting that the focus of this study primarily revolves around the teaching methods that educators openly profess and employ.

However, it is essential to consider the concerns raised by Silva (2024) with regards to facilitating effective design learning. The author proposes a comprehensive approach consisting of four stages. The first stage involves clearly specifying the objectives of the module and continuously aligning them as the semester progresses. Secondly, it necessitates designing class tasks or activities that effectively contribute to meeting these objectives, followed by the implementation of said activities. Moreover, the author emphasizes the importance of creating an environment that promotes these learning objectives, and subsequently, ensuring that students are socialized and understand the significance of these activities.

Nevertheless, it must be recognized that these researchers adopt a rather generalized approach when it comes to design modules. Tesar (2021), on the other hand, asserts that design pedagogy cannot simply be packaged as a one-size-fits-all solution. Instead, he argues that it should be perceived as complex and context-based, mirroring the nature of design itself. He strongly believes that effective design teaching and learning should be integrated into ongoing courses, taking into account the specific choices and considerations within each educational context. Furthermore, it should encompass the development of both mental and physical attributes.

Consequently, this study was undertaken to gain a comprehensive understanding of how design teaching has evolved in the digital age. Considering the rapid advancements in technology and its impact on the field of design, it is crucial to delve into this subject matter and explore the transformative aspects it entails. By investigating the evolution of design teaching practices in the digital age, this study aims to contribute to the broader understanding of design pedagogy and its implications in contemporary educational contexts.

Comparative Analysis of Teaching Approaches

First, a comprehensive definition of traditional lecture-based teaching in the context of design education is provided. The authors describe this approach as a teacher-centered method where knowledge is delivered through the lectures in a systematic way. They believe that in a design's problem-solving and decision-making process, knowing "what" is not enough. Instructors should also teach students "how" to apply their thought and reasons as they move on in their decision-making process. This pedagogic approach has to provide critique and reflection as part of the learning process, and not simply accepting "received wisdom," the authors argue. Critics of the lecture-based teaching claim that lectures treat learning as a passive process, increase curricular coverage motives, and reduce the material that needs to be evaluated (Archila et al., 2024). In addition, it emphasizes the role of the teacher as the sole expert and the deliverer of information. In recent decades, over the education field, there has been an increasing number of criticisms from the lecture-based teaching, favoring pedagogic approaches that encourage class participation and student engagement in the learning process. On the other hand, in the project-based learning section, the authors start with a brief characterization of project-based learning and then explain how it is applied in the context of design education. The authors describe project-based learning as a student-centered pedagogic approach where students work on a long-term project which is a complex task that is designed to engage students in the investigation of real. By working on projects, students are introduced to problem-solving, exploring new and different learning areas, decision-making processes, life planning, and social awareness. The authors of the paper also believe that in project-based learning, projects should be situated in the real world and allow students to have choices, make decisions, and be independent (Coffman et al., 2023). Towards the end of the project-based learning section, the authors critically discuss the potential benefits and the possible challenges of this approach. It is suggested that project-based learning shifts the emphasis from "what type of knowledge should be transferred" to "how and in what context the knowledge should be used." The importance of students learning from constructing their own meaning and from engaging in inquiry has been emphasized. As a result, the students' long-term retention of knowledge, understanding, and critical

thinking is enhanced. However, the design problems that are used in the project-based learning approach need to have a high degree of intellectual integrity and challenge students' current knowledge in order for it to be genuinely cognitive work. Also, an instructor trained in the traditional lecture-based teaching education may need time to adapt to the facilitation role in the active learning process. (Bramble & Bahadur, 2021).

Approach 1: Traditional Lecture-Based Teaching

Traditional lectures are a common teaching method. The approach in design education involves the teacher's capacity to transmit information efficiently, where knowledge is delivered to students and their role is expected to be the absorber of knowledge (Awacorach et al.2021). Lecturers tend to control and lead the discussion, and students are bound to listen. Lectures are a standard teaching method and could be used for large groups. It is effective with skilled teachers only as it requires a high level of proficiency. Furthermore, the approach suits content-dense subjects and theoretical explanations for complicated issues. However, motivation is very crucial during a lecture session in order to enhance the students' focus on learning (Bature, 2020). Modern learning theories put more emphasis on the concept of student-centered learning. A review of modern education methodologies reveals there is a significant trend from this traditional transmission model to the transformational learning models.

The research focus on the process of teaching and learning between the teacher and the learner known as pedagogy has shifted from the old-fashioned method, which was a teacher-centered lesson (Woods & Copur-Gencturk, 2024). The focus will be on the teacher in delivering the knowledge, where students are the knowledge receiver. The teacher will be the one performing a high level of thinking, and the student will be able to understand and memorize new information better. Students are machine-like and built to serve others. According to Awacorach et al. (2021), they believe adult students should be treated as mature, independent, and able to make decisions for their own learning. And the transition from depending learning to independent learning "andragogy" is critical to the learning in this modern society. They proposed several assumptions of adult learners, which include collaborative learning and the establishment of a mutual goal to complete a task. They emphasize that students and teachers should work together on discovering the knowledge, and it is not just given by the teacher.

Approach 2: Project-Based Learning

Second in the sequence of teaching approaches, the text outlines the basic framework that supports project-based learning - learning by doing. A primary distinction is introduced between the ideas of instructional and constructional validity (Ningsih et al.2020). This section offers a more in-depth explanation and analysis of project-based learning than provided in course notes and presentations of teaching and learning theory and practice. The potential benefits of the project-based approach, such as enhancing student motivation, and the development of students' problem-solving and teamwork skills are outlined. In addition, the text discusses the challenges for a project-based approach such as the constraints on student learning which can result from the accumulation of educational technologies. The grammatical and analytical aspects of the assignment are discussed, such as the real audience beyond the tutor and the conventions of teamwork. The writer discusses the use of technical grammatical terminology to describe genres and sub-genres in the assignment and how such linguistic solutions are negotiated between students in the teamwork. A general review of the effectiveness of the approach is given, using both a range of theoretical courtship presented by the module and qualitative feedback. The writer posits that, while on the surface a student and tutor may engage in a joint enterprise based on common ground and cooperation, the reality is that autonomy can lead to a processional orientation - the accumulation of evidence that representations are true and valid - and a lack of engagement between teacher and student.

Approach 3: Collaborative Learning

The third teaching approach analyzed in the study is called "collaborative learning". It is described as a method that aims to promote interaction among students and enhance their ability to work as a group. In collaborative learning, the role of the instructor is to facilitate learning and guide students through their problem-solving processes, rather than just providing solutions (Warsah et al.2021). Through the interactions with peers and the instructor, students are not only able to work on their teamwork and communication skills, but also more likely to develop a deep understanding of knowledge.

The teacher is not the sole content deliverer; instead, students learn from each other actively and collectively. Also, collaborative learning is based on the idea that knowledge is not a personal thing, it is a shared and joint experience among the students which can enhance their social and cognitive development (Qureshi et al.2023). In recent years, the significance of collaborative learning has been increasingly recognized in disciplines such as science and engineering. However, this teaching approach is not confined to these fields; it is also considered as an effective method for in other subjects, for instance, arts and languages. It has some true advantages that can potentially benefit students' learning outcome. For example, when students are working on group projects collaboratively, they will be exposed to alternative viewpoints and learn to appreciate diversity. This will be a good preparation for their future workplace where they might need to cooperate with people from different backgrounds (Endrawan & Aliriad, 2023). Also, the feedback provided from team members as well as the instructor can help individuals to reflect and expand their own opinions. Last but not least, sharing the learning experience with others can make the learning journey more enjoyable and stimulating (Zhu et al.2020). Students are encouraged to be more actively engaged and driven in their studying. The current research on collaborative learning in design education is still in the early stages. It is challenging to many in academia to integrate such pedagogy into design curriculum where the class sizes can be very large and the subject itself is very much individual-based. More empirical studies and expert experiences on implementing collaborative learning in different design disciplines will certainly bring new insights. Well-planned quantitative and qualitative assessment on students' learning experience and their study achievements can give clear evidence on the effectiveness of collaborative learning for design education.

Study Methodology

The primary aim of this study was to investigate teaching methodologies in interior design pedagogy. Descriptive comparative research was conducted, comparing different approaches. A literature review established an understanding of teaching approaches and expected outcomes. Three main teaching categories were identified: traditional, project-based, and interdisciplinary. This research employs a mixed-methods approach, encompassing both qualitative and quantitative techniques through the use of online questionnaires and interviews. Data will be gathered from instructors and students in interior design programs at Gulf University and Kingdom University in Bahrain to gain a comprehensive understanding of teaching and learning experiences in interior design studio courses. The reasons for selecting these two universities because thire programs (interior design) are engineering-oriented and well-regarded in Bahrain. In addition, these programs integrate traditional, project-based, and interdisciplinary teaching methods, aligning with the focus of this research and it provides a unique perspective on design pedagogy. To analyze the data and make meaningful comparisons, it was applied statistical analysis and thematic coding.

The questionnaire comprises 14 questions that encompass four key areas: demographic information, teaching approach and pedagogy, assessment and evaluation, and overall satisfaction. The interview, on the other hand, includes 10 questions covering demographic information, teaching approaches, comparative analysis, and student experiences and outcomes.

Study Sample

The methodology for selecting the research sample targeted interior design students and academicians from Gulf University (GU) and Kingdom University (KU). The selection criteria were as follows:

Students: The sample included 100 students (both undergraduate and postgraduate), aged between 18 and 40, from the Interior Design Engineering program at GU and the Interior Design program at KU. These students were selected based on their enrollment in design studio courses. These courses encompass various aspects of design education, including both traditional drawing techniques and modern design labs that use Computer-Aided Design (CAD) software. The students' participation in these courses ensured they were exposed to practical, hands-on projects, aligning with the research focus on real-project integration.

Faculty Members: The interview phase involved 15 academic staff members from GU and KU who were teaching in the interior design engineering programs. The selection of these faculty members was based on their involvement in teaching design studio courses, which included both drawing and CAD labs. The criteria for selecting faculty members also

considered their academic background and professional experience in the labor market, ensuring a comprehensive perspective on both educational and industry practices. These faculty members were chosen for their expertise in incorporating real-project experiences into the curriculum and their ability to align course design with modern developments and learning outcomes.

The interviews with the faculty members were conducted using Microsoft Teams, allowing for in-depth discussions about their teaching methodologies, integration of real-project experiences, alignment of course design with learning outcomes, and incorporation of feedback mechanisms. This approach ensured that the selected participants had relevant experience and insights, contributing to the validity and depth of the research findings.

Limitations of Study:

1.   Geographical Limitation: The study focuses solely on Gulf University and Kingdom University in Bahrain, which may limit the generalizability of the findings to other regions or countries with different educational contexts and cultural backgrounds.

2.   Program Specificity: By concentrating only on the Interior Design programs at these two universities, the study's findings may not be applicable to other design disciplines or engineering programs that might employ different teaching methodologies.

3.   Time Constraints: the study was conducted in the First Semeter during academic year 2023-2024. The duration of the study was may limit the ability to observe long-term effects of different teaching methodologies on student outcomes and pedagogical effectiveness.

Study Results

Results of Students' Questionnaire

Table 1 shows that 66.1% of the students were female, while 33.9% were male. The majority of students, approximately 66.7%, were between 18 and 24 years old. Regarding the educational background of the participants, the results indicate that 65% of the respondents were undergraduate students, while 26.7% were graduate students, and 8.3% were post-graduate students.

Table 1. Data Summary of Demography Questions

Gender	% as total responses no.
Male	33.9%
Female	66.1%
Total	100%
Age	% as total responses no.
18-24	66.7%
25-34	26.7%
35-44	6.7%
Total	100%
Educational Background	% as total responses no.
Undergraduate	65%
Graduate	26.7%
Post-Graduate	8.3%
Total	100%

In the teaching approach and pedagogy area, the results indicate that 55% of the participants agree, while 23.3% strongly agree that the design studio instructors effectively communicate the course aims. In contrast, 11.7% of respondents strongly disagreed, and 8.3% of respondents indicated neutrality. Additionally, 80% of respondents indicated that the design studio encourages collaboration and interaction among students. On the other hand, 13.3% of respondents disagreed with this

concept, and a very small number of participants (6.7%) remained neutral. Based on the results, it appears that a majority of the participants, totaling 74.6% (45.8% + 28.8%), have a positive perception of the design studio instructors' provision of timely and constructive feedback on student work, either agreeing or strongly agreeing with this statement. This indicates that the design studio instructors are generally effective in providing timely and constructive feedback. A relatively small percentage of participants, 3.4%, disagreed, and an additional 6.8% strongly disagreed with the idea that the design studio instructors provide timely and constructive feedback. This suggests that there might be some dissatisfaction or perceived inadequacy among a minority of the respondents. Furthermore, 15.3% of the participants remained neutral, which could indicate a lack of a strong opinion or an uncertainty among this group regarding the promptness and helpfulness of the feedback provided by the design studio instructors.

A significant majority of participants, comprising 73.3%, either strongly agree (25%) or agree (48.3%) with the notion that the design studio integrates real-world projects or challenges effectively. 13.3% of participants remained neutral, suggesting a lack of strong opinion on the matter. Meanwhile, 13.3% of the participants disagreed (5%) or strongly disagreed (8.3%) with the integration of real-world projects or challenges within the design studio.

A substantial majority of participants, comprising 75% (53.3% strongly agree and 21.7% agree), express a positive view, indicating that the design studio effectively promotes critical thinking and problem-solving skills. Approximately 11.7% of participants remain neutral on the subject, suggesting they may not have formed a strong opinion or require further information to assess the studio's impact on these skills. A minority of 13.3% (3.3% disagree and 10% strongly disagree) express negative views about the design studio's ability to enhance critical thinking and problem-solving skills.

As for the design studio's provision of experiential learning for students, a majority of participants, comprising 73.4% (41.7% strongly agree and 31.7% agree), have a positive view, indicating that the design studio effectively provides experiential learning for students. While a minority of 10% (1.7% disagree and 8.3% strongly disagree) express negative views about the design studio's ability to offer experiential learning. Approximately 16.7% of participants remain neutral on the subject, suggesting that they may not have a strong opinion or require further information to assess the studio's effectiveness in providing experiential learning. Table 2 provides a summary of the responses to the questions in the teaching approach and pedagogy area.

Table 2. Summary of the responses to the questions in the teaching approach and pedagogy area

Teaching Approach and Pedagogy	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The design studio instructors effectively communicate the course objectives and expectations.	23.3%	55%	8.3%	1.7%	11.7%
The design studio encourages collaboration and interaction among students.	30%	50%	6.7%	3.3%	10%
The design studio instructors provide timely and constructive feedback on student work.	28.8%	45.8%	15.3%	3.4%	6.8%
The design studio incorporates real-world projects or challenges.	25%	48.3%	13.3%	5%	8.3%
The design studio promotes critical thinking and problem-solving skills.	53.3%	21.7%	11.7%	3.3%	10%
The design studio provides experiential learning for students.	41.7%	31.7%	16.7%	1.7%	8.3%

As for assessment and evaluation area, A significant majority of participants, comprising 76.7% (15% strongly agree and 61.7% agree), perceive that assessment methods in the design studio align with the course objectives. Approximately 10% of participants remain neutral on the subject, suggesting they may not have a strong opinion or require further

information to assess the alignment of assessment methods. However, a minority of 13.3% (5% disagree and 8.3% strongly disagree) express negative views about the alignment of assessment methods with course objectives. The assessment methods in the design studio appear to have a positive impact on students' design thinking skills, as indicated by the following results, a significant majority of participants, totaling 78.3% (28.3% strongly agree and 50% agree), believe that assessments in the design studio improve students' design thinking skills. While a minority of 11.6% (3.3% disagree and 8.3% strongly disagree) express negative views regarding the effectiveness of assessments in enhancing students' design thinking skills. Approximately 10% of participants remain neutral on this matter, suggesting that they may not have formed a strong opinion or need further information to assess the impact of assessments on design thinking skills.

The feedback given to students for their assessments within the design studio has received predominantly positive feedback. The results demonstrate that a substantial majority of participants, totaling 81.6% (comprising 28.3% strongly agreeing and 53.3% agreeing), believe that students are provided with helpful and constructive feedback for their assessments. Approximately 8.3% of participants remain neutral on this issue, suggesting they may not have formed a strong opinion or require additional information to assess the quality of the feedback provided. A minority of 10% (with 3.3% in disagreement and 6.7% strongly disagreeing) express negative views regarding the feedback's effectiveness in promoting constructive feedback for students.

The participants were asked about the overall satisfaction about the teaching methods and pedagogy in the design studio, in general, the majority of respondents are content with the teaching methods and pedagogy in the design studio. Specifically, 83.3% either strongly agree or agree with the methods, while only a small percentage, 10% in total, expressed disagreement or strong disagreement. Overall, a significant percentage of respondents feel well-prepared for a career in design by the design studio. The combined percentage of those who strongly agree and agree is 81.6%, while those who disagree or strongly disagree make up a much smaller portion at 8.4%. Table 3 summarizes the responses to the questions related to assessment and evaluation and overall satisfaction areas.

**Table 3. Summary of the responses to the questions related
to assessment, evaluation and overall satisfaction areas.**

Assessment and Evaluation	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Assessment methods in the design studio align with the course objectives.	15%	61.7%	10%	5%	8.3%
Assessments in the design studio improve students' design thinking skills.	28.3%	50%	10%	3.3%	8.3%
Students receive constructive feedback on their assessments.	28.3%	53.3%	8.3%	3.3%	6.7%
Overall Satisfaction	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Overall, I am satisfied with the teaching methods and pedagogy in the design studio.	20%	63.3%	6.7%	1.7%	8.3%
I feel that the design studio has adequately prepared me for a career in design.	18.3%	63.3%	10%	1.7%	6.7%

Results of Staffs' Interview

As mentioned above, the interview was conducted with 15 academic staff in GU and KU who are teaching in interior design and interior design engineering program. The interviews were conducted through Microsoft Teams (online meeting) by author. Table 4 shows that 57.1% of participants were male, while 42.9% were female. In terms of educational background, 64.3% held a PhD, and 35.7% had a master's degree.

Table 4. Data Summary of Demography Questions

Gender	% as total responses no.
Male	57.1%
Female	42.9%
Total	100%
Educational Background	**% as total responses no.**
PhD	64.3%
Master	35.7%
Total	100%

Teaching Approaches

The participants were asked about types of design studio pedagogy have they used in design studio, the data indicated that the majority of respondents. The results provide an overview of the prevalent design studio pedagogies currently employed in educational settings. Among the various methods identified, traditional lecture-based instruction emerges as the most utilized, accounting for 64.3% of the responses. Concurrently, project-based learning and design thinking each registered a significant 50% response rate, showcasing the growing emphasis on practical, hands-on learning approaches. Notably, collaborative learning and experiential learning were also prevalent, garnering response rates of 42.9% and 50% respectively. These findings collectively underscore the recognition of the importance of fostering both theoretical knowledge and practical skills within the realm of design education. Table 5 shows types of design pedagogy used by academic staff.

Table 5. Types of design studio pedagogy used by academic staff

Design Studio Pedagogy	% as total responses no.
Traditional lecture -based instruction	64.3%
Problem-based learning	50%
Project-based learning	57.1%
Design thinking	50%
Collaborative learning	42.9%
Experiential learning	50%

The participants were asked about the strengths and advantages of the teaching approaches they use in design studio pedagogy. The transcriptions were reviewed and broken down into phrases and sentences representing the participants' main ideas or meaningful experiences. Several key strengths associated with the teaching approaches have been identified. Qualitative findings were summarized in Table 6. The findings indicate that design studio pedagogy offers a holistic educational experience, emphasizing practical, real-world applications, critical thinking, collaboration, and innovation. Traditional lectures remain valuable for delivering foundational knowledge efficiently. Combining these approaches provides a well-rounded education that prepares students for the multifaceted challenges of the design profession. The participants made the following comments regarding the advantages of the using different types of teaching methods:

"Collaborative learning approach always ensures pupils working together on learning activities in small groups hence it will ensure everyone's participation. Along with that it also helps in the development of higher-level thinking, communication and leadership skills of the students. In a problem-based learning approach, the students will come up with solutions to the problem using their prior knowledge and resources. This helps in deeper learning compared to traditional lectures. Experiential learning enables the students to follow their own ideas and work through problems as they arise." (Participant 1)

"Design thinking pedagogy emphasizes effective communication and storytelling. Students learn how to articulate their design concepts and findings to both their peers and potential clients or stakeholders. Real-World Experience: The emphasis on practical projects and client-based work in some design studios provides students with real-world experience, helping bridge the gap between academia and industry". (Participant 4)

Table 6. Summary of strengths and advantages of the teaching approaches

Teaching Approaches	Strengths Points
Collaborative Learning Approach	• Ensures active participation and engagement. • Develops higher-level thinking, communication, and leadership skills among students. • Mirrors the collaborative nature of real-world design professions, preparing students for teamwork.
Problem-Based Learning (PBL)	• Encourages students to apply prior knowledge and resources to find solutions. • Promotes deeper learning compared to traditional lectures. • Motivates students by presenting them with authentic and challenging problems.
Experiential Learning	• Allows students to actively engage in design projects. • Encourages the application of theory to practical design challenges. • Provides valuable real-world experience, bridging the gap between academia and industry
Integration of Multiple Approaches	• Creates an interactive and engaging learning environment. • Adapts teaching methods to the level and complexity of the project.
Real-World Experience	• Utilizes real projects with authentic design constraints. • Students engage with potential clients early, gaining insight into space users' needs. • Fosters creativity and innovation as students explore and experiment with design solutions.
Creativity and Innovation	• Encourages creative thinking and exploration of unconventional design solutions. • Allows students to generate fresh ideas to address complex design challenges.

Comparative Analysis

Furthermore, several key limitations and challenges associated with the teaching approaches have been identified. Qualitative findings were categorized into eight themes: technological challenges, student diversity and engagement, resource and infrastructure limitations, practical constraints, quality and engagement issues, teaching method limitations, time constraints, and assessment challenges. Table 7 summarizes the findings of limitations for the teaching approaches.

Table 7. Summary of findings of limitation for the teaching approaches

Thems	Codes
Technological Challenges	• Staying up to date with learning technology
Student Diversity and Engagement	• Varied student responses to teaching approaches • Engagement challenges in collaborative learning
Resource and Infrastructure Limitations	• Inadequate teaching environment • Lack of resources and weak infrastructure
Practical Constraints	• Limitations of site visits • Diverse student levels
Quality and Engagement Issues	• Apathy, low productivity, poor quality • Challenges in project-based learning structure
Teaching Method Limitations	• Passive learning in traditional lectures
Time Constraints	• Time-consuming nature of project-based learning
Assessment Challenges	• Subjectivity in evaluating design thinking. • Difficulties in group dynamics assessment

In terms of mitigating these challenges in education, the results presented a range of strategies and approaches for addressing challenges in education, particularly in the context of advanced training. These findings emphasize the importance of tailoring teaching methods to individual student skills, utilizing diverse instructional techniques, and providing the necessary support and resources for both educators and learners. They also highlight the significance of fostering engagement through active learning methods, as well as promoting effective communication and teamwork skills among students. Furthermore, the results stress the value of clear assessment criteria, incorporating multimedia resources to accommodate various learning styles, and facilitating professional development for instructors to enhance their proficiency in teaching methodologies. Additionally, the integration of technology and the inclusion of real-world projects and case studies are recognized as effective means to demonstrate the practical application of concepts. The participants made the following comments:

"By choosing different learning strategies and make groups that might open more opportunities to accommodate students" (Participant 14)

"Use of Technology: Incorporate technology like interactive presentations, simulations, and online quizzes to make lectures more engaging and interactive. Real-World Projects: Integrate real-world projects and case studies to show the practical application of design thinking principles" (Participant 12)

Regarding teaching approaches and their perceived effectiveness on student learning, the results showed a clear distinction between the respondents' opinions. When asked to compare their teaching approach to other approaches, A notable 85.7% of the participants believe that their teaching approach is "more effective," highlighting their confidence in the positive influence it has on students. Meanwhile, a smaller proportion, 14.3%, indicated that their teaching approach is "about the same" as others. These results suggest that the majority of educators feel that their teaching methods are superior in terms of their impact on student learning, emphasizing the importance of continued innovation and improvement in teaching practices.

Student Experience and Outcome

As for the students' satisfaction with the teaching approaches used in design studio pedagogy, the findings indicated 85% of participants confirmed that their teaching approaches have a positive impact on students' satisfaction, skills, creativity, and overall learning outcomes

Discussion of Results

The primary objective of this research is to illuminate the advantages and disadvantages of different approaches, with the ultimate goal of providing valuable insights for enhancing design education's best practices. The objective of this research was achieved by using mixed methods qualitative academicians' interviews) and quantitative methods (students' questionnaires) to gain students and instructors perceptions and experience teaching approaches in design studio pedagogy. An observation revealed an alignment in the outcomes between students and academic staff.

Overall, these results suggest that the teaching approach and pedagogy in the design studio are generally well-received, with a majority of participants expressing positive views about communication, collaboration, and feedback. However, it's essential to pay attention to the minority of participants who expressed dissatisfaction or neutrality, as there might be specific areas that need improvement or further investigation. These results can serve as a starting point for educators to make targeted enhancements to the studio's pedagogical methods, ensuring the needs and expectations of all participants are met.

In terms of feedback provision, a majority of participants have a positive perception of timely and constructive feedback. This indicates that the design studio instructors are generally effective in providing valuable feedback, although there is room for enhancement. The integration of real-world projects or challenges is well-received by a significant majority.

The positive perception of the design studio's role in promoting critical thinking and problem-solving skills is a

significant achievement. As for the provision of experiential learning, the majority of participants view this aspect positively. In the assessment and evaluation area, a significant majority of students perceive alignment between assessment methods and course objectives, indicating that the evaluation process is meaningful and relevant. These findings support the previous research conducted by El Marsafawy and colleagues in 2020, where they examined Project-Based Learning and Experiment-Based Learning as practical hands-on learning approaches. The reassessment of pedagogical strategies is anticipated to bolster the continual advancement of teaching and learning methodologies.

Furthermore, the high percentage of students who believe that assessments in the design studio improve their design thinking skills indicates the positive impact of the assessment methods. Feedback for assessments within the design studio receives predominantly positive feedback. This is a significant strength, but it's essential to address the concerns of the minority who express dissatisfaction. These results agree with the study's results by (Fernandes et al., 2014) as they have the same notion.

The staff interviews provide valuable insights into the prevalent teaching methods and pedagogical approaches. It's clear that a diverse range of teaching methods is employed, emphasizing the importance of both theoretical knowledge and practical skills in design education. The strengths identified, such as practical applications, critical thinking, collaboration, and innovation, underscore the comprehensive nature of design studio pedagogy. However, the challenges identified, including technological issues, student diversity, and resource limitations, indicate areas where further improvement and support are needed. The strategies suggested by staff to address these challenges emphasize the importance of tailoring teaching methods, promoting engagement, and enhancing the skills of educators.

In conclusion, the study's results demonstrate a generally positive perception among students regarding the teaching approach and pedagogy within the design education program. It also highlights areas where further improvement is possible, such as communication of course aims and addressing the concerns of students who disagree with certain aspects of the program. The staff interviews provide valuable insights into the strengths and challenges of the teaching approaches employed and emphasize the importance of continuous improvement in design education. Overall, the findings indicate that the design education program is effective in preparing students for successful careers in the field.

Conclusion

In summary, the study concludes that project-based learning and collaborative learning are more effective than traditional lecture-based teaching. It is interesting that the findings of this study align consistently with current day designers asking for graduates to be more capable of mediating between different disciplinary specialisms. With the rise of digital technology providing more platforms for work between subjects, the need for better rounded education in terms of acknowledging and working well with others has never been so crucial. Automatic animation and perspective control systems significantly increase user productivity by automatically computing possible in-betweens and perspective views and renderings based on intuitive user models. However, instead of helping students to communicate, designers can often remain isolated within a computer screen even in a collaborative environment. The findings within the paper provide an opportunity to re-evaluate the effectiveness of different teaching methods on the development of a student's ability to work with and interpret existing contexts in a broad and critically relevant way to the subject. To understand its limitations, potentials and physical and social aspects is a vital aspect of contemporary practice whether this be in architecture or the wider creative industry. To further enhance the understanding of teaching methodologies in design pedagogy, future studies could focus on aligning course design with learning outcomes. Ensuring that the course design is explicitly aligned with the desired learning outcomes will help create a cohesive educational experience where each component of the course directly contributes to achieving the stated objectives.

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