Research Article / Araştırma Makalesi

TOWARDS A SHARED FUTURE IN DESIGN EDUCATION: A COLLABORATIVE DESIGN PEDAGOGY EXPERIMENT IN THE ARCHITECTURAL DESIGN STUDIO

TASARIM EĞİTİMİNDE ORTAK BİR GELECEĞE DOĞRU: BİR MİMARİ TASARIM STÜDYOSUNDA İŞBİRLİĞİNE DAYALI TASARIM PEDAGOJİSİ DENEYİMİ

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Abstract
This paper presents a working model of collaborative design pedagogy, developed and tested in an architectural design studio (AD VII) context. As an interdisciplinary study in a theoretical sense, this research introduces a practical and methodological experiment to enhance students' inter-scale and integrative thinking. The study employs a quantitative approach, analyzing data collected through structured surveys that evaluate individual and group work processes over a semester. Findings show that the collaborative method enhances access to information, enriches idea diversity, deepens research quality, increases presentation performance, and strengthens understanding of interdisciplinary relationships and strategic thinking across scales. These outcomes are directly tied to the method's foundational principles: collective intelligence and shared labor. The results point to the potential scalability of this method beyond the design studio, suggesting its adaptability across architectural education curricula. Detailed analysis of the survey data, as discussed in the conclusion, offers practical recommendations for improving the implementation and structure of similar pedagogical models. This study ultimately contributes to ongoing debates about the future of architectural education by providing an evidence-based framework grounded in collaboration and methodical process design.

Keywords: Collaborative Design Pedagogy, Collective Design, Collective effort, Design Education, Interdisciplinarity

Öz
Bu makale, bir mimari tasarım stüdyosu (AD VII) bağlamında geliştirilen ve test edilen işbirlikçi tasarım pedagojisinin bir çalışma modelini sunmaktadır. Teorik anlamda disiplinler arası bir çalışma olan bu araştırma, öğrencilerin ölçekler arası ve bütünleştirici düşünmelerini geliştirmek için pratik ve metodolojik bir deney sunmaktadır. Çalışma, bir dönem boyunca bireysel ve grup çalışması süreçlerini değerlendiren yapılandırılmış anketler aracılığıyla toplanan verileri analiz eden nicel bir yaklaşım kullanmaktadır. Bulgular, işbirlikçi yöntemin bilgiye erişimi artırdığını, fikir çeşitliliğini zenginleştirdiğini, araştırma kalitesini derinleştirdiğini, sunum performansını artırdığını ve disiplinler arası ilişkiler ile ölçekler arası stratejik düşünme anlayışını güçlendirdiğini göstermektedir. Bu sonuçlar, yöntemin temel ilkeleri olan kolektif zeka ve ortak emek ile doğrudan bağlantılıdır. Sonuçlar, bu yöntemin tasarım stüdyosunun ötesinde potansiyel ölçeklenebilirliğine işaret etmekte ve mimarlık eğitimi müfredatına uyarlanabilirliğini göstermektedir. Sonuç bölümünde tartışıldığı üzere, anket verilerinin detaylı analizi, benzer pedagojik modellerin uygulanmasını ve yapısını iyileştirmek için pratik öneriler sunmaktadır. Bu çalışma nihayetinde, işbirliği ve metodik süreç tasarımına dayanan kanıta dayalı bir çerçeve sunarak mimarlık eğitiminin geleceği hakkında süregelen tartışmalara katkıda bulunmaktadır.

Anahtar Kelimeler: İş birliğine dayalı pedagoji, Kolektif tasarım, Kolektif emek, Tasarım eğitimi, Disiplinlerarasılık

INTRODUCTION

Architectural design is gradually transforming from a one-person action into a form of production in a team (Tan et al., 2023).The act of design is a multi-layered set of actions that require research, approach development, and idea generation processes and their expression. For this reason, instead of a single person carrying out the entire process while designing, the cooperation of more than one person with a common mind and labor power contributes to faster and more refined results. Especially in urban-scale projects, teamwork becomes almost mandatory. In such a case, the production of space is no longer just building design, but environmental relations, urban components across scales, and social, cultural, and political factors come into play. Therefore, it becomes imperative for the field of architecture to develop a strategy by receiving feedback from other disciplines.

In this context, professional undergraduate programs in architecture, where teamwork and interdisciplinary work are on the rise, face an increasingly urgent need to train students in relevant content and design strategies. However, it is impossible to say that architectural education accompanies this increasingly collective form of production in architectural design or provides sufficient space for it. This is because, in many architecture schools, project studios at all levels still.

The design studio has historically served as a platform for various pedagogical methods in architectural education. It is increasingly evolving towards a student-oriented approach where learners assume more responsibility in their educational journey (Liebman, 1997; Koch et al., 2002; Salama, 2010; Johnson, 2017).This shift to active learning emphasizes students gaining insights from their research and interactions, including with peers and urban contexts. The embracement of collaborative strategies, recognizing students as vital contributors rather than isolated learners, marks a significant transition in educational paradigms (McPeek, 2009). Research over the last thirty years underscores the efficacy of collaborative learning in design pedagogy, showcasing its superiority over competitive models that pit students against each other (Anthony, 2002; Bruffee, 1993; Cuff, 1989; Denton, 1997; Dillenbourg et al., 1996; Emam et al., 2019; McPeek & Morthland, 2010; Ismail & Soliman, 2010; Kelly, 2017; Dutton, 1987). Central to this pedagogical framework is the belief in collaborative learning, where students work in teams to address challenges or projects, fostering a culture of mutual learning and critical thinking. In such environments, peer review and collective problem-solving encourage refining ideas beyond individual constraints (Kelly, 2017; Emam et al., 2019; Demirtaş, 2021).

Collaborative design involves a teaching method that encourages students or designers to work together on projects, combining their knowledge and efforts. This approach, called Collaborative Design Pedagogy (CDP), focuses on student-centered learning and aims to promote collaborative learning within design studios. It draws on various theoretical and practical frameworks, such as experiential learning (Kolb, 1984), participatory design (Mumford & Henshall, 1979), participatory learning (Mills-Jones, 1999), collaborative learning (Bruffee, 1993), cooperative learning (Johnson et al., 2008), and co-intelligence (Atlee, 2002). The collaborative design method synergizes the collective intellect and effort, necessitating risk-taking, information sharing, and goal alignment for superior outcomes compared to solo efforts (Kvan, 2000). Extensive research demonstrates its merits in more democratic decision-making, effectiveness from labor distribution, and the ability to quickly generate high-quality solutions thanks to broader information access (Ismail et al., 2023; Kelly, 2017; Sainsbury, 2008; Srivastava, 2020; Sukkar et al., 2024; Webb, 2006). Moreover, it significantly enhances interpersonal, communication, and problem-solving skills (Sainsbury, 2008, p. 105), preparing design students well for their careers through its prevalence in interdisciplinary and scalable design practices (Webb, 2006; Tucker, 2007; King & Behnke, 2005).

Recent studies in design education reveal that collaborative pedagogy not only merges disciplinary cultures (Kelly, 2017) but also sensitizes students to global and environmental politics (Srivastava, 2020) and shows the beneficial impact of non-studio learning strategies on their quality of education and motivation (Kamalipour, 2014; Sukkar, 2024; Kelly, 2017). Such studies underscore the pedagogical value of collaborative design projects (CDPs), fostering idea development and refined solutions through peer discussions, aligning with the ethos of modern architectural practice (Ismail et al., 2023; Kamalipour, 2014; Qureshi, 2019; Sukkar, 2024).

This article delves into the feasibility of implementing collaborative learning pedagogy in the architectural design studio. It focuses on integrating critical points within the context of collaborative design. Prior studies have emphasized the need for the collaborative design and pedagogy (CDP) method to concentrate on areas of expertise in architectural design studio courses in higher education in Turkey, particularly in scales and interdisciplinary issues. While these practices have been incorporated in courses such as urban design, urban planning, and urban landscape, the design studio has no specific examples. This study aims to assess the effectiveness of CDP methods, which include individual and group work, in boosting learning quality, student motivation, and participation levels. By striving to achieve student-centered and collective learning, this study lays an essential groundwork for implementing innovative practices in an architectural design studio.

The study examines collaborative design processes (CDP) to enhance and diversify design and learning experiences by combining collective knowledge and a shared workforce. However, it is not guaranteed that this interaction will universally have positive effects, as collaborative learning, which promotes learning by increasing interaction between individuals, is a psychological and pedagogical activity (Dillenbourg, 1999, p. 5). A well-planned setting in the design studio could address this issue. Upon examining the studies, it was found that some issues were overlooked, prompting the development of an approach that explicitly addresses these points. Consequently, the studio is structured in three phases. The first phase involves collective knowledge production, focusing on 'collective intelligence'; the second phase entails collaborative design activities through teamwork; and the third phase is a mixed method (combining individual and collective) phase, where this information is blended and individually tested. As a result, both collective and individual processes were tested in the studio, and the findings were discussed.

METHODOLOGY AND FINDINGS

Based on a literature review showing the effects of the collaborative design method on students' learning quality and satisfaction levels, this research employs a quantitative method through a case study and a survey. Focusing on one semester of the fourth-year Architectural Design Studio at Sakarya University, the survey results are complemented by authors' observational studies and evaluations of student work throughout the term.

The survey was conducted anonymously at the end of the semester, and ethical approval was obtained for the survey design. It was implemented as a digital e-form, and a 15-minute time slot was allocated during studio hours to ensure that all students could fill it out simultaneously. Instructors, seeking objectivity in students' responses, informed them that the survey results would be used to develop suggestions for improving architectural education and would only be shared with researchers. This survey, designed based on information from the literature review, is a preliminary investigation to measure student satisfaction and attitudes toward the design studio (Figure 1).
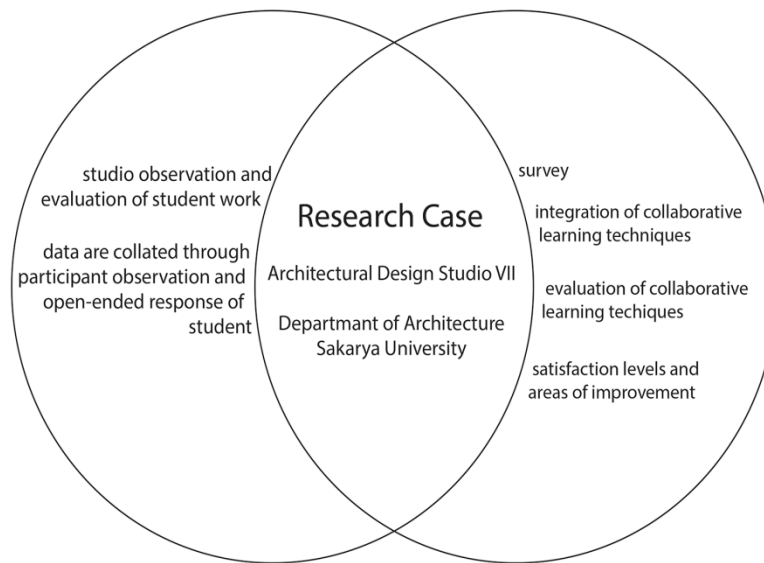
Figure 1. Methodological approach diagram (adopted from Sukkar et. al., 2024).

Participations and primary course information

The design studio, led by four lecturers with 83 students (63 female, 20 male), was part of the Architectural Design VII studio in the fourth year, serving as the final project before the diploma. It focuses on inter-scale projects about social housing or urban and cultural facilities, selected for their significance in architectural education. This course is crucial as it combines theoretical and practical discussions, marks the last studio course before graduation, and encompasses many students, enhancing the survey results' reliability.

This project studio, enriched with seminars, presentations, and discussions, builds on various theoretical frameworks. It demands active participation in theoretical debates, research, and the practical realization of ideas through drawings, models, and texts. Recognizing housing as a fundamental right linked to political economy and historical, cultural, and climatic processes, the studio examines social housing under six main headings: Urban Connectivity, Utilization/Economics, Pattern/Atmosphere, Ecology/Sustainable Infrastructure, Social/Communal Spaces, Construction/Tectonics. This holistic framework equips future architects with the interdisciplinary perspective and collaborative skills needed to address the complex aspects of social housing design (Figure 2).
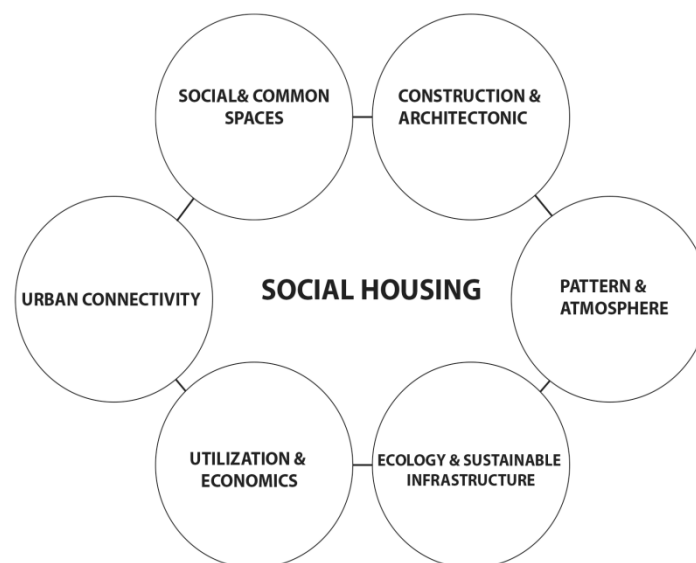

Figure 2. Key foci of work on Social Housing, Source(s): Author's work.

Focus/location: The studio focused on the Bağcılar/Esenler area in Istanbul, notorious for its high disaster risk. Chosen due to the pressing need for urban transformation debates amidst speculation about a potential Istanbul earthquake, this densely populated area is home to primarily low-income residents and suffers from insufficient social and cultural facilities (IPA, 2021).

Studio collaboration process design: Social housing design demands a multidisciplinary approach, utilizing a collaborative design method to enhance the studio process. However, to prevent potential issues that may arise in teamwork, such as individual performances getting lost in the middle, freeloading, and loss of concentration, individual and collective contributions were equally built by determining a specialty area for which each student is responsible. This method fosters collective knowledge via field trips and case studies, benefiting individual work and experience.

The studio's approach is divided into three phases to explore social housing comprehensively. Phase I focuses on research and drafting guidelines by probing six key social housing themes. Phase II involves developing strategies and models for urban connectivity and master planning. The final phase, Phase III, combines site planning with the refinement of individual projects, guided by previously established design strategies, culminating in a comprehensive master plan. (Figure 3).

week	1	2	3	4	5	6	7	8	9	10	11	12	13	14
process	phase I					phase II					phase III			
active semi-active deactive	**speciality groups** individual design groups					**design groups** individual speciality groups					**individual** design groups speciality groups			
individuality	%20													%80
collectivity	%80													%20

Figure 3. Process design of the studio on individual and collective work, Source(s): Author's work

The first step of collaborative studio participation is forming learner groups or teams. When constructing such groups, three critical factors must be considered: membership, size, and group types (Nováková et al., 2010). In this context, the collective organization of the studio was shaped through two different group types: the specialty/research group and the design group. When determining the group size, the content and scope of the six main specializations identified in the context of social housing were considered. Group members were randomly selected to increase diversity and in-studio interaction. Students with different backgrounds, experiences, and ideas formed heterogeneous groups. This naturally stimulates professional practice through more robust discussions but can affect performance and final output. Undoubtedly, homogeneous groups can achieve better results in terms of performance but lack diversity (Thomas McPeek & Morthland, 2010). Moreover, students' self-selection of their groups may lead to relatively successful groups forming within themselves, preventing the learning experience and success from spreading throughout the class.

The initial phase involved organizing into specialization groups to foster idea diversity and mitigate inefficiency risks. For each topic, at least two groups were formed, each comprising 4-7 members for effective teamwork (Figure 4). Design groups were established in the first week but commenced their primary work in the fifth week after four weeks of collective research, which shaped the design guidelines. The presence of one person from each of the six fields of expertise in each design group and the transformation of the design guidelines into the open source of the studio ensures that the period consisting of three phases has a holistic fiction.
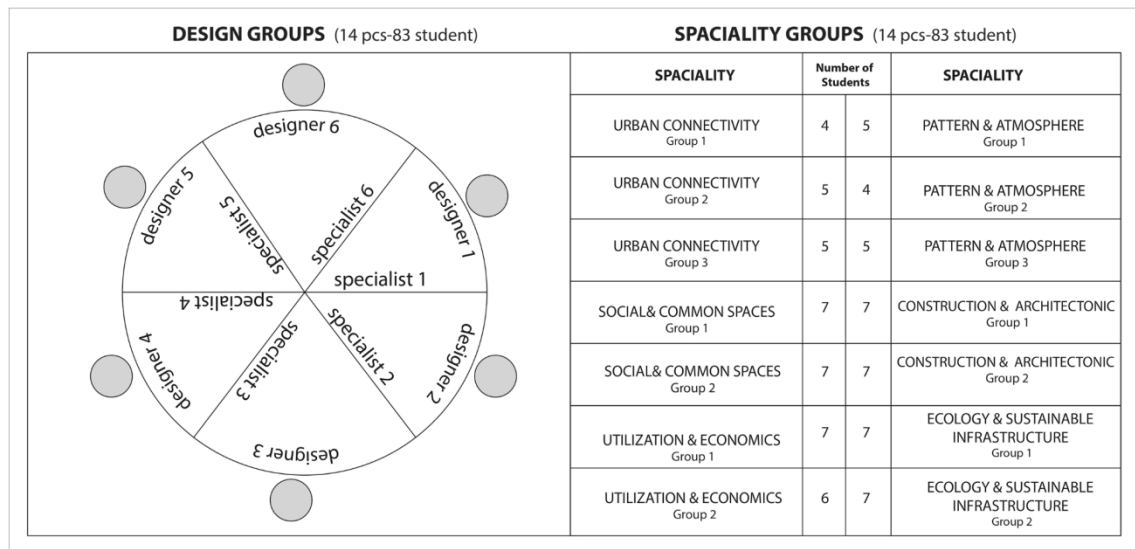
Figure 4. Grouping strategy diagram, Source(s): Author's work

The initial phase spanned four weeks, focusing on social housing through morning seminars and joint discussions, with afternoons dedicated to evaluating student presentations. The research broadly categorized social housing into six main themes. The goal was to foster a collective knowledge base, involving all students and coordinators actively.

This phase involved extensively reviewing articles, books, and project case studies. The information gathered was synthesized into guidelines representing a collective knowledge repository. These guidelines, produced by the collaborative efforts of the studio team, transformed complex insights into a structured and easily accessible resource. Consequently, this translated the vast expertise within a specific domain into a distilled and universally accessible format as a tangible manifestation of collective intelligence documentation (Figure 5).

Figure 5. Phase I: Design guidelines for social housing, Source: Author's archive

In the project's intermediate phase, teams focused on site selection, strategy formulation, and master plan creation, following the urban connectivity group's guidelines—each team, composed of members from different specialties, prioritized collaboration, and equitable responsibility sharing. Using the guidelines as a resource, teams developed their designs with annotations on the utilized data, culminating in a comprehensive master plan that outlined six distinct zones, reflecting the collective effort.

The project emphasized a hands-on approach involving design sketching, joint modeling, mapping, and site analysis. Teams were tasked with devising varied strategies and models to tackle six key themes in social housing. Throughout the design evolution, group and individual discussions facilitated the refinement of ideas, simultaneously enhancing students' critical thinking skills (Figure 6).

Figure 6. Phase II Teamwork posters consisting of approach, strategic decisions and master plans, Source: Author's archive

In this final phase, students focused on individual projects while still integrating the guidelines and decisions from a collaborative master plan. This approach allowed individual insights to spark enhancements in the master plan via group feedback, fostering a dynamic of mutual enrichment. The goal was to meld collective wisdom with personal learning and design experiences.

Figure 7. Phase III Individual project posters linked to a common site and master plan, Source: Author's archive

Survey

In a survey conducted at the end of the 2023-2024 autumn semester, 83 undergraduate students were targeted, with 77 participating. The group comprised 59 fourth-year, 21 fifth-year, and three sixth-year students, with 56 females and 21 males.

The study's questionnaire was organized into three sections, encompassing eighteen questions, designed to evaluate the efficacy of various learning methods within architectural education's design studio context. In the first part of the survey, students were asked to evaluate the learning methods used in the design studio within architectural education. The research explores effective learning methods in architectural design studios, focusing on passive learning, individual performance, collective intelligence, and cooperative learning. The survey assessed student opinions on blending cooperative learning with collective intelligence, examining their impact on knowledge acquisition, understanding and applying principles, analytical problem-solving, idea exchange, work efficiency, and time management. Additionally, it contrasted collective and individual work in urban-scale project research, investigating the pros and cons of each. Questions about the environments and spaces utilized for collective work were also included.

In Part II, we focus on assessing collaborative learning techniques. Participants were surveyed on memorable aspects of the studio, including individual and group research, presentations, and instructor feedback. Another set of questions explored the most and least effective learning moments during the studio, assessing the challenges faced by students. In the final part, student satisfaction with the course methods and areas for improvement were evaluated, with a specific interest in the student's perception of the cooperative learning model and their cognitive development throughout the course. The analysis employed descriptive statistics and frequency analysis in Excel and SPSS to interpret the results.

Findings

Upon review of the questionnaire study, with careful screening excluding any bias towards extreme options, the sample size was confirmed to be 77. Research findings revealed a strong preference among students for collaborative over individual work in the study of urban-scale project research processes, with 87% in favor, as depicted in Figure 8.
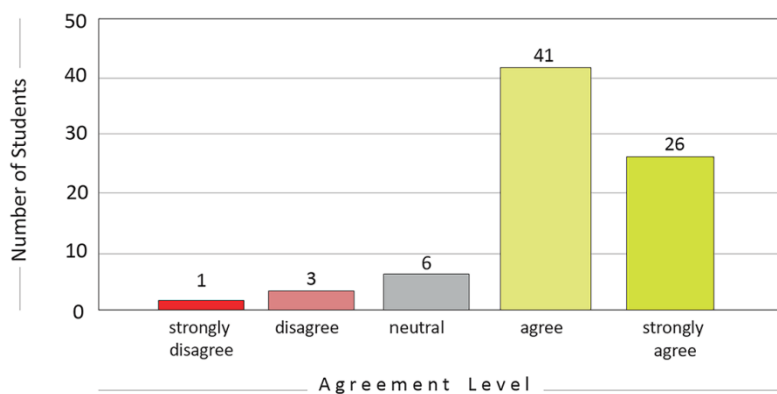

Figure 8. Degree of students' agreement that collaborative work is more effective in terms of learning than individual work. Source(s): Author's work.

In the AD VII course context, 85.7% of students endorsed the value of CDP over individual efforts and passive learning for architectural design studios, emphasizing cross-discipline and scale work. Additionally, 63.6% acknowledged that the collective intelligence approach, aiming at creating a shared knowledge space among all course participants, outperformed traditional passive learning methods regarding research efficiency. A smaller fraction, 22.1%, highlighted the superior value of collaborative learning methods—group-based student collaborations—over solo efforts in learning processes, as outlined in Figure 9.
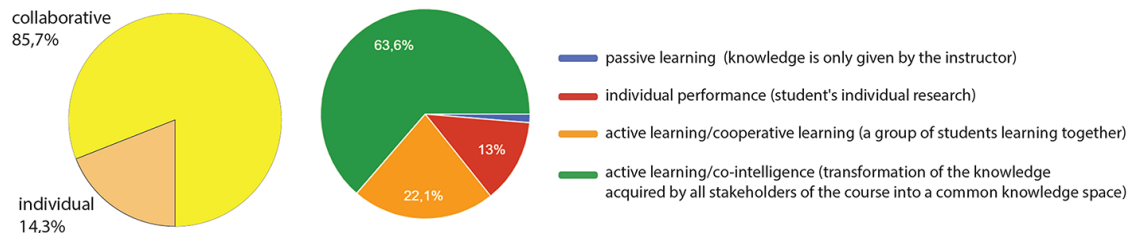
Figure 9. Response of the students on how to better conduct the research and learning process in architectural design studios that require interdisciplinary and cross-scale work. Source(s): Author's work.

36.4% of students felt the integration facilitated understanding urban design through specialization teamwork. 28.6% appreciated the swift access to diverse information via collaboration. In comparison, 13% cited improved decision-making from internal feedback, 10% mentioned problem-solving through collective wisdom, and 6.5% highlighted efficient learning from task distribution (Fig. 10-a). When asked about their opinions on this subject in the extra question, most students stressed that the CDP strategies were helpful for more sophisticated creations and efficient use of time. "If the study had been conducted individually, obtaining such a range of information in such a short amount of time would not have been feasible." "We realized very serious and in-depth productions in a short period. The fact that the design theme was divided into areas of specialization and one person in each area conducted in-depth research made it easier for us to grasp the problem in an interdisciplinary and inter-scale context." "We were able to work more concentrated because our teammates constantly warned us. We could get distracted by looking at irrelevant places when doing individual research".

In the AD VII studio, students identified significant issues with CDP techniques compared to individual research, primarily highlighting disparities in team contributions. Other noted problems include difficulty in accessing collaborative work environments (18.2%), intra-team conflicts and decision-making challenges (15.6%), and unequal work distribution (3.9%). Additionally, 6.5% of students found all the mentioned issues applicable (Figure 10-b).

In a survey about group project experiences, students highlighted several issues: challenges in assembling, uneven work allocation, communication hurdles, and ideological disparities. Additionally, five students reported dissatisfaction with the limited access to school workspaces outside regular hours.

It is seen that students predominantly (81.8%) prefer familiar places, such as cafes and canteens, to work collectively in processes outside the workshop. Other preferences are 10.4% online platforms, 3.9% private spaces such as home and dormitory, 2.6% atelier, and 1.3% library (Figure 10-c).

The students were asked to compare the collaborative learning method with the method in this studio if they had a project studio in which they had worked with the collaborative learning method before. Approximately 20% of the students stated they had worked with similar methods. Of those who said yes, 25% stated that these studios were similarly positive. Approximately 25% of the students stated that this semester's studio was more detailed and planned than other examples, as it was designed in three separate phases and differentiated through specializations, and therefore, the results were more in-depth and qualified. "Yes, I have done group work in the urban design course before. I found this studio positive in that the individuals in the group specialized in different subjects, the deepening of the subject-specific studies, and the common evaluation of the information accessed."

Group study and conversations during the AD VII studio's research phase are the most favored methods, as indicated by the questionnaire (44.2%). Data from Fig. 10-d shows that students retained 19.5% of instructor comments, 16.9% from studio presentations, and 15.6% of independent research. Positive feedback about group work was particularly noted, with students citing benefits like diverse ideas, mutual motivation, enhanced production quality, peer communication, dynamic discussions, ownership

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of knowledge, a fast-paced work environment, and valuable feedback.

Students think that the areas of knowledge they have developed the most during the AD VII studio process are the ability to work across scales, especially from urban design to residential scale. In addition, the ability to work and develop strategies across disciplines such as landscape, air conditioning, economics, and social-communal spaces was also emphasized in the responses. The participants also stated that they realized the importance of teamwork in dealing with different disciplinary fields and improved themselves in making decisions and producing ideas.

In the learning methodologies used in the Architectural Design VII studio, some of the most challenging situations for the students are the disruptions caused by inter-scale and interdisciplinary studies. The students stated that the decision-making processes related to the urban design scale, the research on the field of expertise, and the process of transforming it into an output were very tiring but, at the same time, instructive. Another area the students commented they needed help with was the third phase, in which they moved from group work to individual designs. Many participants emphasized that this process needed at least one more week to reach the final product.
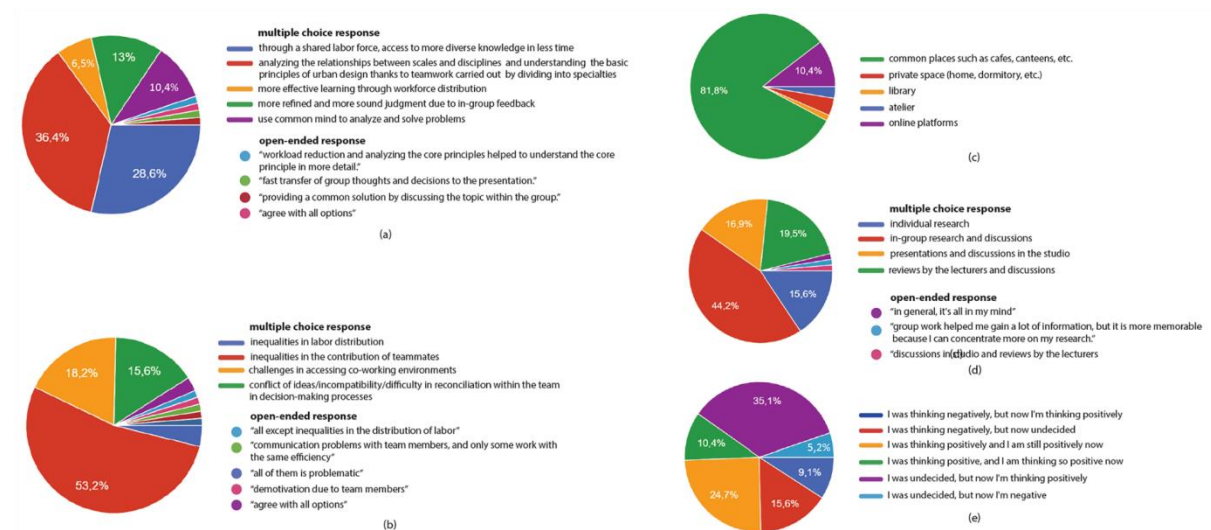

Figure 10. Percentage of students' opinions (a) on which aspect is more productive, (b) which aspect has problems, (c) which environment is used more, (d) which processes are more memorable, and (e) the change in thinking between the first and last lesson. Source(s): Author's work.

The final section of the survey focused on the student's satisfaction with the training methods. An impressive 87% of the students expressed high satisfaction with the CDP methods (see Figure 11-a). There was a generally positive shift in the student's opinions about the collaborative design method from the first to the last. Around 70% of the students' opinions improved, while the remaining 30% did not change or changed negatively (see Figure 10-e). Additionally, 86% of the students believe that other studios should enhance their learning methodologies and experiment with new methods. Furthermore, 85% of students agree that the teaching methods used in the AD VII course could serve as a valuable model for other studio courses (see Figures 11b and 11c).
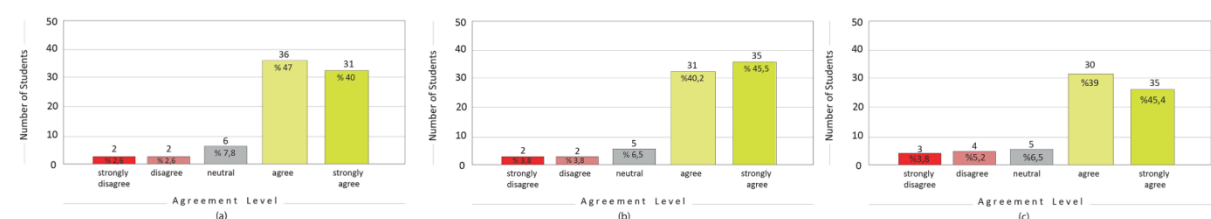

Figure 11. L(a) level of satisfaction with the CDP approach used in the studio, (b) the degree of responses about experimenting with such methods in other studios, (c) the degree of response that

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CDP implemented in AD VII can be a beneficial model for other studios courses.

The feedback from students reveals critical insights for refining the method. Approximately 20% felt the third phase of the studio was less productive and lacked smooth phase transitions. About 15% believed that allowing students to select their group members would enhance motivation. They also stated that although there was a need for more instructor, space problems, and communication problems within the group, the resulting work increased their self-confidence and created significant satisfaction.

The questionnaire results indicate that students prefer collaborative learning methods over individual learning. This supports the hypothesis that collaborative techniques in the AD VII course enhance learning quality. The questionnaire results indicate that students prefer collaborative learning methods over individual learning. This supports the hypothesis that collaborative techniques in the AD VII course enhance learning quality. Collaborative efforts lead to faster access to diverse knowledge, more efficient information processing, and better long-term retention. They also improve the understanding and application of interdisciplinary concepts and strategies. Additionally, the diversity of ideas and creativity in projects is boosted by collaborative feedback, fostering a more engaging environment than individual work.

DISCUSSION

This research paper examines the effectiveness of CDP in enhancing learning quality through a case study of an architectural project studio. It explores the integration of individual and collective work, measuring student satisfaction and identifying areas for improvement. The research complements the publications cited in the literature review, focusing on the learning method in an urban-scale design studio (AD VII) at SAU. A comparison is drawn between this article and existing publications regarding how they address CDP, particularly concerning aspects such as interdisciplinarity, interaction between different scales, the number of students, student classification, and process design. These differences have a direct impact on the research findings.

Kelly (2017) emphasizes the advantages of collaborative pedagogy in merging disciplinary cultures through visualization in learning projects. The case study "Testing the Field" involved a partnership between the MMU Faculty of Science and Engineering and Manchester School of Art with 15 students, demonstrating that removing traditional constraints like physical space and departmental boundaries enhances interdisciplinary dialogue. Although Kelly's findings on disciplinary barriers are valuable, they may not directly apply to more extended design studios due to the study's short duration and limited participants. Nonetheless, this research illustrates that a studio model promoting collaboration across departments can create a meaningful interdisciplinary environment. Although this possibility could not be evaluated because there are no departments such as interior architecture, urban planning, or landscape architecture in the faculty where this study was conducted, this suggestion can be an example for other faculties. This shows us that collaborative methods can be important in design education, but the faculty administration and curriculum should support this.

Further supporting this idea, Sukkar et al. (2024) found that active learning strategies significantly improved learning quality and student motivation in non-studio architecture courses. However, because their study did not focus on design studios, it limits insights into comprehensive design projects (CDPs). This underlines the potential for collaboration to address complex design problems in studio settings. Srivastava (2020) argues that architecture students must be aware of pressing environmental issues like sustainability and climate change, which the traditional focus on individual work in design studios often neglects. Her findings suggest that using CDPs can quickly enhance students' understanding of these critical topics. Similarly, Akıncıtürk et al. (2014) demonstrated the benefits of cognitive diversity through an eight-week study involving students from various levels. Qureshi (2019) reinforces this with evidence showing that a joint design studio improved collaborative skills and confidence among 81 students over a four-week course. İsmail et al. (2023) further highlight the need for collaborative design in contemporary architectural practices, demonstrating that hybrid studios enhance peer discussions and collaborative idea development. While these studies support the notion of collaborative design pedagogy (CDP), they vary in scale, participant numbers, and durations, which can significantly impact outcomes.

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For instance, studies focusing on first-year students, like those by Akıncıtürk, Srivastava, and Qureshi, cover shorter studio experiences, limiting their insights into more complex issues.

On the other hand, İsmail et al. (2023) conducted a semester-long study with second-year students, although it lacked significant challenges concerning scale. This paper contributes to existing literature by linking collaborative design pedagogy to different project scales. Working collaboratively across diverse scales prepares students for professional environments by enhancing teamwork skills. Finally, collaborative design experiences, such as those explored by Kamalipour et al. (2014), are crucial for developing interdisciplinary learning opportunities. Their study in an urban housing studio employed research methods like SEM and factor analysis to explore relationships between size, place, and process over 7-8 months. Although their processes share similarities with other studies regarding individual and group work, differences in group sizes and student participation levels highlight the varied approaches to interdisciplinary design. Additionally, in the study, the inter-scale is left open in more general terms, and there is no dialogue with disciplines such as landscape architecture, urban planning, economy-politics, and sociology, which are encountered when going beyond the scale of architecture (Table 1).

Table 1. Approaches, techniques, focus, process management, and concerns in different studies of collaborative design studies, Source(s): Author's work.

studies	duration	class	inter-scale interaction	interdisciplinarity	number of students	process design
Akıncıtürk vd.(2014)	6-8 weeks	1th-2th	from 1/50 to 1/200	___	23	only collective
Qureshi (2019)	4 weeks	2th	from 1/1 to 1/100	___	81	only collective
İsmail vd. (2023)	6 weeks	1th-2th	From 1/50 to 1/200	___	unspecified	**both individual and collective**
Kamalipour vd. (2014)	**32 weeks** two semesters	2th undergraduate	from 1/50 to 1/1000	___	28	only collective
Kelly (2017)	1-2 weeks	2th undergraduate	1/1	**totally**	16	only collective
Srivastava (2020)	6,5 weeks	2th master	from 1/50 to 1/200	___	36	**both individual and collective**
Sukkar vd. (2024)	14 weeks one semester	**3th-4th undergraduate**	from1/50 to 1/500	___	68	only collective

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This research	14 weeks one semester	4th undergraduate	from 1/50 to 1/5000	Semi (only content)	83	both individual and collective

In our study, we identified some significant differences from other studies in the literature. To address social housing in an interdisciplinary manner, we tailored our design process to meet this need. Two main differences set our project apart. First, the project covers a broad subject that requires interdisciplinary and inter-scale work, with each group member focusing on a specific area of expertise. This approach deepened the overall output and provided practical learning experiences for each member. Second, our process involves both individual and group work. The first phase emphasizes intensive teamwork within specialized groups, followed by continued teamwork within design groups, and concludes with individual and collective productions. This process has allowed members to closely follow and contribute to discussions in other areas of expertise within the studio. Although the study demonstrates the significant impact of the mixed method, the literature review should further discuss this approach.

CONCLUSION
This study demonstrates a tested and structured collaborative design pedagogy model developed within the AD VII architectural design studio. The study is, in fact, a pedagogical experiment that focuses on how collaboration can be effectively integrated into architectural education.

The findings show that the collaborative design studio model strengthens student learning in multiple ways. More than 85% of participants reported that working collaboratively helped them better understand complex transitions between design scales. Over 90% stated that shared research and collective thinking improved their ability to remember, connect, and apply knowledge from different domains. The graphs (Figures 8, 9, 10, and 11) reflect this overall satisfaction and indicate a clear improvement in learning quality.

This model goes beyond simply assigning students to work in teams. It creates a framework where learning is produced collectively, and knowledge emerges through shared processes. Students developed more profound insight into complex design problems—such as social housing—when they worked in structured teams that encouraged interdisciplinary thinking. The results support the idea that design education should promote collective design rather than focus solely on individual creativity.

Despite these positive outcomes, some challenges were observed. Unequal distribution of work within teams was one of the key issues. Future applications of this model include strategies like peer evaluations or rotating roles to ensure more balanced participation. Another point for improvement is team formation. While this study used randomly assigned groups, future studies might explore letting students form their teams if there are precise mechanisms for resolving conflicts and ensuring accountability.

This model should be applied over multiple semesters and integrated into different courses across the architecture curriculum for broader impact. Involving students from other departments—such as urban planning, landscape architecture, interior design, or sociology—can help build stronger interdisciplinary collaborations and enrich learning experiences. However, such integration will require institutional support, including curriculum alignment, faculty coordination, and adequate resources.

This is especially important in countries like Turkey, where rising student numbers demand more effective and scalable teaching models. Embedding collaborative pedagogy into the core curriculum can enhance educational quality and prepare students more effectively for professional environments where teamwork and communication are essential.

In conclusion, this study offers more than a call for collaboration—it proposes a concrete and adaptable method for improving studio education. The model has shown that structured collaboration triggered

deeper learning, creative design thinking, and better project outcomes. Future research should continue developing this model by:

- Testing it in different institutional and cultural settings,

- Combining quantitative findings with qualitative evaluations,

- Exploring how digital tools can support collaboration,

- And assessing how well students retain and apply what they learn over time.

Ultimately, this study calls to rethink design studios as collaborative learning spaces—where knowledge is built together, not alone.

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