ORIGINAL SCIENTIFIC PAPER
DOI: 10.63395/STEDConf14022025903M495
Submitted: 19.08.2025.
Accepted: 19.11.2025.

THE ROLE OF CURRICULUM AND METHODOLOGY IN TEACHING ARCHITECTURAL DESIGN

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ABSTRACT

This paper analyzes approaches and methods for teaching architectural design at the undergraduate level, focusing on office and administrative spaces at the Faculty of Architecture, Civil Engineering and Geodesy, University of Banja Luka. The study examines how curriculum structure and methodological strategies influence the development of students' design competencies.

The methodology combines theoretical analysis of design studio pedagogy with qualitative evaluation of teaching practices, project assignments, and student work across multiple generations. The study analyzed pedagogical factors, organization of the design process, use of analog and digital tools, student-mentor collaboration, and the role of site context in concept development.

Findings reveal a dual approach to learning: (1) an adaptive curriculum that responds to students' abilities, prior knowledge, and thematic variations; and (2) a methodological framework based on iterative revisions, tool integration, and collaborative work, fostering analytical, conceptual, and presentation skills.

The study confirms that a clearly defined and adaptive curriculum, combined with structured methodological strategies, enhances the quality of architectural design education and effectively prepares students for professional practice.

Keywords: education, design studio pedagogy, live architectural models , project reviews

INTRODUCTION

In the contemporary context, marked by dynamic changes in social, technological, and professional circumstances, architectural education faces the ongoing need to adapt its objectives and teaching methods. A key role in this process is played by architectural design, as the core discipline within architecture study programmes, through which students not only acquire methods for shaping space, but also develop creative abilities, analytical thinking, and professional attitudes necessary to respond to the challenges of contemporary architectural practice.

Within this framework, the design studio has, for decades, represented the fundamental form of architectural education worldwide. At the same time, it stands as the central component of the Architecture programme at the Faculty of Architecture, Civil Engineering and Geodesy, University of Banja Luka (hereinafter: the Faculty). Based on the principle of *learning by doing*, the design studio enables students to develop skills of analysis, synthesis, and expression in the design process by simulating real architectural problems (Schön, 1987; Salama & Wilkinson, 2007).

Although the role of the design studio is clearly defined, practical experience indicates the need for a continuous improvement of the teaching process—particularly in terms of selecting design assignments and structuring the curriculum in line with contemporary social challenges and the dynamic conditions of the professional environment.

The aim of this paper is to analyse and enhance approaches and methods of teaching architectural design at the undergraduate level, by examining experiences and outcomes of design studios implemented at the Faculty of Architecture in Banja Luka. A particular focus is placed on Design Studio 7 – Work and Leisure Spaces, used as a case study, analyzing project assignments

related to office and administrative spaces, with the aim of identifying potentials for improving teaching models and more effectively guiding the development of students' design competencies

Accordingly, the research seeks to:

- present the theoretical and pedagogical foundations of architectural education, with emphasis on the design studio as the primary didactic platform;
- analyse the structure and specific characteristics of the design studio curriculum in the Architecture programme at the Faculty in Banja Luka;
- examine how carefully conceived design assignments contribute to the systematic development of students' design competences;
- indicate possible improvements to teaching approaches and methodologies in architectural design.

In this way, the paper aims to contribute to a better understanding and more purposeful direction of educational practices that shape the contemporary competences of future architects, in accordance with the needs of the profession and the dynamic evolution of spatial typologies.

MATERIAL AND METHODS OF WORK

evaluating and improving the curriculum of architectural design education at the undergraduate level. The theoretical framework includes a review of relevant literature and contemporary pedagogical approaches to design studio teaching, emphasizing the role of the studio project in developing students' design competencies and critical thinking skills.

The empirical component was conducted through a detailed analysis of teaching practices within the Architecture undergraduate program at the Faculty of Architecture, Civil Engineering and Geodesy, University of Banja Luka. Particular attention was given to Design Studio 7 – Work and Leisure Spaces, with data collected and analyzed regarding the structure and content of the project, including course syllabi, project assignments, student work, documentation of public presentations, and observations of student–mentor interactions. The analysis focused on evaluating student outcomes, curriculum integration, and the role of different spatial programs in shaping students' understanding of function, form, and structure.

Special emphasis was placed on the organization of the design process, including the alternating use of analog and digital tools, collaborative problem-solving, and iterative project reviews. This approach enables a systematic assessment of pedagogical factors and concrete student outcomes, providing a foundation for recommendations to enhance the curriculum and methodological framework of the design studio.

Theoretical framework: design studio pedagogy

Contemporary architectural education focuses on acquiring design methods and developing creative, analytical, and critical competences through direct engagement with real and simulated spaces and functional challenges, preparing students for the complexity of professional practice.The central element of this process is the design studio, which for decades has been recognized as the fundamental pedagogical model in architecture schools worldwide (Schön, 1987; Salama & Wilkinson, 2007).

The design studio is based on the principle of "learning by doing," where students develop the competences necessary for independent and responsible design through practical assignments. Unlike traditional academic methods, this pedagogical form emphasizes the development of knowledge and skills through concrete design tasks, classifying it within competency-based and project-based learning approaches (Salama, 2015; Schön, 1987).

Donald Schön (1987), a prominent philosopher and educator, defines the design studio through four key dimensions: as a specific culture of collaboration and shared learning between instructors and students; as a physical space for conducting this process; as a particular mode of teaching; and as an organized sequence of activities and assignments structuring the curriculum. This holistic approach highlights both pedagogical and social aspects of the studio environment (Schön, 1987).

Within this specific educational setting, intensive one-on-one interaction between mentors and students enables dynamic knowledge exchange and the creation of innovative solutions. Students confront complex problems similar to real professional situations, solving them through iterative experimentation and evaluation processes with continuous mentor support (Dulić, 2021; Candy, 2006).

Through the design studio, students develop three interrelated competences: a specific mode of architectural thinking, the architectural language used to express that thinking, and technical skills in drawing and visual representation (Lawson, 2006). These skills can be fully acquired only through practical work and solving real design problems, which the design studio facilitates (Schön, 1987).In this context, the design studio represents the framework within which the curriculum is implemented through a concrete design process – analysis, conceptualization, and presentation of architectural solutions. It forms the core teaching methodology of architectural education, serving as the medium through which pedagogical goals and curricular contents are put into practice (Salama & Wilkinson, 2007; Schön, 1987).

However, challenges arise in implementing this model, especially when methodological approaches are not adapted to beginner students lacking experiential knowledge and intuitive understanding of design processes. Recent researchers emphasize the importance of introducing phased and structured methodologies that clearly define techniques and tools, as well as the significance of clear visual and graphic representations that facilitate learning and adaptation to complex tasks (Oxman, 2008). This enables more efficient progression in competency development while reducing frustration and increasing motivation among students (Cennamo & Brandt, 2012).

In this sense, the design studio remains a key component of the curriculum, requiring continuous reflection and adaptation of pedagogical methods to respond to the challenges of contemporary professional practice and the needs of new generations of students.

Case Study: Analysis of the Curriculum and Outcomes of Design Studio 7

The undergraduate program in Architecture at the Faculty of Architecture, Civil Engineering and Geodesy, University of Banja Luka, has been implemented in accordance with the officially accredited academic curriculum since the 2020/21 academic year. Within this curriculum, the design studio constitutes the central pedagogical component of the program, structuring the educational process and enabling the continuous development of students' knowledge and competencies throughout all years of study, in alignment with the theoretical and pedagogical foundations outlined above.

The teaching of architectural design at the Faculty, organized through design studios, is structured to gradually introduce typological categories of design: from introductory exercises and small-scale projects, through individual and collective housing (third and fourth semesters), to more complex programmatic structures such as work and leisure spaces (fifth semester), and hybrid programs (cultural, healthcare, etc.) in the final years of study.

Within this chronologically organized framework, in the fifth semester, Design Studio 7 – Work and Leisure Spaces represents the first systematic exposure of students to public programs and more complex urban contexts.

The research presented in this paper encompasses an analysis of teaching practices in Design Studio 7 over three consecutive academic years under the new curriculum, enabling the monitoring of methodological consistency, evolution of teaching strategies, and selection of design tasks. The collected data include archives of student projects, course syllabi and project briefs, informal discussions with instructors and students, and documentation of public presentations. Each cohort comprised approximately 50 to 60 students, with a weekly schedule of 4 hours of lectures and 5 hours of exercises.

The methodological approach of this study is grounded in qualitative and content analysis of the Design Studio 7 curriculum, combined with a systematic review and interpretation of student work produced during three consecutive teaching cycles. Particular emphasis was placed on the

formative evaluation process, conducted through multiple stages of assessment and feedback throughout the semester.

The research was carried out within the framework of standard teaching practices at the Faculty, with all authors of this paper actively engaged in the implementation of architectural design education.

Teaching in Design Studio 7 has expanded in scope compared to previous years, where the primary focus was on residential design. This expanded structure facilitates the introduction of diverse programmatic requirements and familiarizes students with more complex architectural typologies. However, it also poses a challenge for the teaching team in formulating pedagogically relevant and stimulating project themes, as well as in selecting locations that provide design challenges conducive to high-quality studio assignments.

Over the past three academic years, two key design topics have been developed within the studio, both centered on administrative spaces with complementary programs:

"Dream Laboratory – Center for Architectural Research";

"Conceptual Architectural and Urban Design of the Building of the Republic Institute for the Protection of Cultural-Historical and Natural Heritage."

These design assignments are formulated to encourage students to respond architecturally to the character of the theme and project brief. The focus is on identifying architectural expressions aligned with institutional, representative, or research frameworks, in accordance with the level of design competencies expected at this stage of study.

In addition to administrative spaces, accompanying programs such as exhibition, conference, and specialized research spaces, as well as hospitality and logistics facilities, have been integrated, allowing students to engage with a broad spectrum of design challenges. This approach is particularly important given the limited opportunities for practical application and the need to cultivate a diverse set of competencies.

The strategic selection of locations is essential for the depth and quality of design analysis. Sites located in transitional zones — between built and natural environments, historical and contemporary contexts, private and public domains — provide students with the opportunity to observe and interpret architectural context in a multilayered manner. Such an approach fosters the development of skills to analyze physical, social, and symbolic aspects of space, as well as sensitivity to place, which is considered a key component of responsible architectural education (Milić Aleksić, 2022).

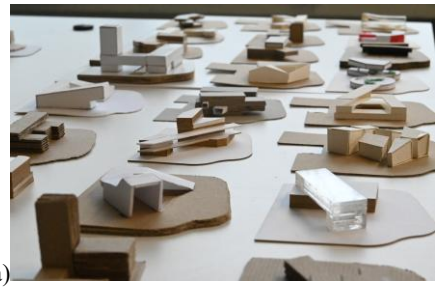
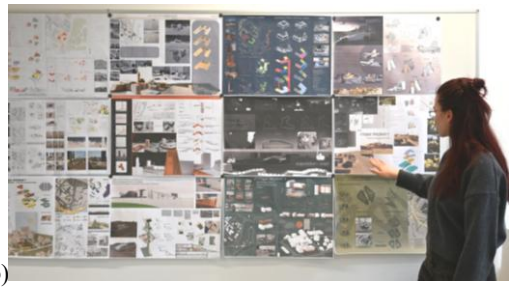
a)  b) 

Figure 1a. Display of conceptual models as tools for research and generation of information and ideas in the early phase of the design process (Module 1: Colloquium 1).

Figure 1b. Public presentation of students and presentation of the initial idea through graphic materials. All instructors participate in commenting and guide each student individually toward further project development (Module 1: Colloquium 1), Studio Project 7, academic year 2024/25.

According to the course syllabus, Design Studio 7 was conducted through lectures and practical exercises. At the beginning of the semester, students were introduced to the course structure and objectives, the implementation process, the project brief, forms and deadlines for submissions, as well as the grading criteria.

The practical part of the course (exercises) was organized into three modules, representing the three fundamental phases of the design process, each defined by specific goals, learning outcomes, and precise tools — both analog (sketches, working conceptual-research and presentation models) and digital (graphic documentation ranging from urban plans to details and 3D building models):

- **Module 1: From program and site analysis to spatial concept**
  This phase encompassed initial analyses and research, culminating in design review 1, conducted as a digital presentation of the spatial concept through drawings and conceptual-research models (Figures 1a, b).
- **Module 2: From concept to architectural assembly**
  This stage involved the arrangement of programmatic and spatial contents aligned with the formal models developed in the previous module, as well as elaboration of the building's function and structural logic.
- **Module 3: From architectural assembly to materialization**
  This final phase included further project development and detailing, finalization of the design concept, and preparation of the final graphic materials. The process concluded with the submission of the semester elaboration in the form of a complete conceptual design. Special emphasis was placed on integrating spatial conception, structural systems, and materialization to ensure the project formed an architecturally coherent whole (Figure 2).

At the end of each module, a submission (design review) was required to evaluate the ongoing work throughout the semester, alongside the final result at the semester's conclusion. Each design review also included feedback from instructors and collaborators, aimed at guiding the student's further development.

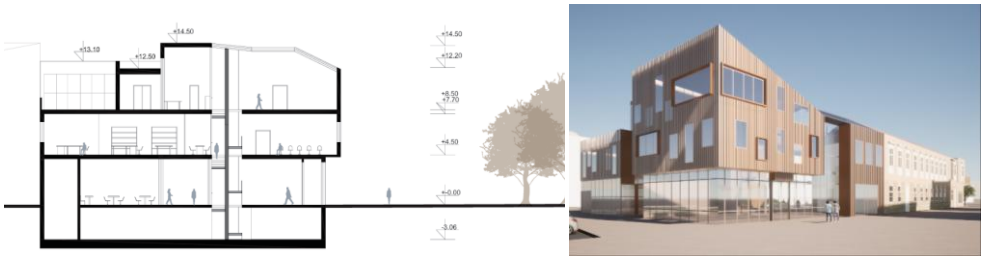


Figure 2. Final graphic attachments of the semester elaboration (Module 3: Colloquium 3) – cross-section and three-dimensional model of the building, within the assignment "Conceptual architectural and urban design of the building of the Republic Institute for the Protection of Cultural, Historical and Natural Heritage."At this stage, students aimed to consistently translate their concepts into architectural solutions that are meaningfully and formally integrated into the existing urban fabric, respecting the spatial, cultural, and contextual specificities of the site. (Illustrations by student Jovana Đurđević, Studio Project 7, academic year 2023/24)

The exam format was conducted in the form of a public defense. Students briefly presented their work to peers and mentors, focusing on the spatial concept, with particular attention to volumetry, spatial character, and the relationship with the surrounding environment. The post-production for the public defense consisted of posters and a final model, which provided the audience with insight into the entirety of the conceptual and spatial solution (Figures 3a, b).

Within Design Studio 7 special attention was given to balancing digital and analog tools, with an emphasis on the model as a crucial element of the design process. From the very beginning, conceptual models were used as a means of exploration and initial spatial articulation in response to the given design problem. They served both as a medium for generating ideas and spatial relationships, and as a tool for analyzing context and programmatic requirements. Throughout the process, through iterative research and development models, the project was shaped and refined in accordance with the set objectives. The final models created by the students in the concluding phase represent a synthesis of the architectural idea. Through clear spatial articulation, structure,

and materialization, the representative model provided the audience with insight into the final solution and the logic of its design (Figures 3a, b).

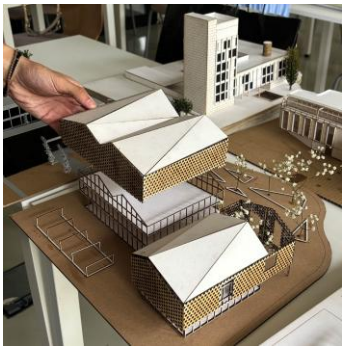


Figure 3a. Exam: students' final models as the result of the concluding phase of the design process.
Figure 3b. Exam: public presentation of the conceptual design with the final model and poster as a form of post-production, Studio Project 7, academic year 2024/25.

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RESULTS

In architectural design education, a key challenge lies in balancing the constraints of a formal curriculum with the need for flexible and development-oriented educational approaches. The analysis of teaching practice at the Faculty of Architecture, Civil Engineering and Geodesy at the University of Banja Luka suggests that a carefully designed design studio can serve as a potential foundation for a transformative learning experience, provided it encompasses two interrelated sets of elements:

(1) curriculum adaptability to the pedagogical context, and
(2) the methodological structure and dynamics of the teaching process.

(1) Curriculum and the Need for Adaptability

The case study, based on qualitative analysis of teaching documents and observation of the actual teaching process, points to several key factors influencing teaching effectiveness: realistic assessment of students' design abilities, continuity in the development of themes, a limited number of studio projects as an important pedagogical resource, and the application of interannual diversity as a strategy for teaching improvement.

Pedagogical influence vectors affecting the organization of architectural design teaching:

- **Current assessment of students' design abilities**

Design tasks within studio projects must align with the actual state of students' knowledge, skills, and independence at the time of instruction. This includes formative assessment of their competencies, not only technical (e.g., visualization, structural thinking, or spatial articulation) but also cognitive—critical thinking, capacity for contextual interpretation, and ability for independent conceptualization. Accordingly, projects must "grow with the students," demanding more only after foundational skills have been established.

- **Scope and type of previous studio project themes**

Analysis of the sequence of previous studios allows instructors to formulate assignments that do not replicate already covered typologies and themes but rather build meaningfully on them. For example, if earlier study phases focused on residential programs, subsequent studio projects should ideally introduce more complex programmatic requirements—public facilities, hybrid structures, public spaces, and their role in shaping the urban fabric. Such thematic diversity fosters adaptability in students and enables the application of acquired knowledge in various spatial and programmatic contexts.

- **Limited number of studio projects and broad spectrum of competencies**

Given the limited number of studio projects throughout undergraduate studies (usually 6–8), each project must be carefully designed to encompass not only typology but also the development of multiple skills: formal articulation, functional organization, contextual analysis, programmatic complexity, spatial logic, and ethical relationships with the environment. The choice of location plays a special role here, with microlocations exhibiting pronounced spatial, cultural, and social layers offering significant potential for developing students' analytical and conceptual competencies.

- **Interannual diversity as a pedagogical strategy**

Over multiple years, the teaching staff gradually builds an internal pedagogical base through variation in themes, locations, and methods. This "interannual diversity" enables continuous testing of different approaches, which can later be transferred to other courses or cohorts. Diversity is especially important in smaller academic communities where instructors work with several generations simultaneously or consecutively. It represents a tool for pedagogical innovation and prevents stagnation of teaching practice.

(2) Methodological Structure and Dynamics of the Teaching Process

Results indicate that an added value in improving the design process was brought by a teaching structure based on the alternating use of analog and digital tools. This combination fosters not only the technical and graphic literacy of students but also the development of critical thinking through comparative analysis of different media of expression (Oxman, 2008). Furthermore, active collaboration between students and instructors, as well as periodic collective critiques and final public presentations, proved to be essential in forming a study culture of mutual learning (peer learning), knowledge transfer, and building confidence in publicly presenting ideas (Schön, 1987; Nicol & Pilling, 2000).

DISCUSSION

The results suggest that meaningful progress in the design studio is closely related to how design tasks are conceptually and pedagogically structured. Carefully formulated tasks, aligned with students' actual levels of knowledge and skills, significantly support the development of critical thinking, creativity, and independent problem-solving in architectural design. These findings are consistent with previous research in design studio pedagogy, which highlights the

importance of gradually introducing complexity and contextual considerations (Schön, 1987; Oxman, 2008).

Integrating various aspects of design — from spatial analysis and conceptualization to technical development and public presentation — supported by the alternating use of analog and digital tools, enables the development of comprehensive competencies. This approach not only strengthens students' graphic and technical literacy but also fosters their ability to interpret space across multiple layers and make well-founded design decisions.

The discussion further emphasizes the pivotal role of the teaching team in structuring a clear, logical, and motivating sequence of tasks, and in adapting pedagogical strategies to different student cohorts. Instructors' adaptability — in selecting themes, sites, and methodological approaches — is key to ensuring the continuous improvement of the design studio process and maintaining pedagogical relevance in the contemporary educational context.

CONCLUSION

This study has highlighted the theoretical importance of the design studio in architectural education and analyzed practical outcomes within the studio at the Faculty of Architecture, Civil Engineering and Geodesy, University of Banja Luka. The findings indicate that the quality of teaching relies on the faculty's ability to recognize students' actual capabilities, organize thematic modules effectively, and continuously adapt pedagogical methods to the needs of each generation.

A clearly defined and adaptive curriculum, combined with a strategically planned methodological approach, not only promotes the development of analytical, conceptual, and presentation skills but also prepares students for professional practice. The integration of curricular and methodological elements facilitates the continuous improvement of the teaching process and ensures the program's pedagogical relevance in the contemporary context of architectural education.

While this research does not exhaust all possible avenues for enhancing design studio teaching, it provides a solid foundation for future studies and the development of pedagogical practices that can contribute to the ongoing advancement of architectural education for emerging professionals.

DECLARATIONS OF INTEREST STATEMENT

The authors affirm that there are no conflicts of interest to declare in relation to the research presented in this paper

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