

Educational and environmental characteristics in the perceptions, challenges, and aspects of teaching novice architecture students

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Detailed abstract

Introduction

Architectural education enables beginners to acquire the knowledge, thinking habits, representational abilities, and professional dispositions required for design practice. Rather than merely transmitting information, design education combines problem definition, inquiry, imagination, representation, critique, evaluation, and revision. The architectural design studio therefore functions as a pedagogical and social setting that simulates aspects of professional practice. Its effectiveness depends on what is taught, how students participate, how instructors guide them, and how the learning environment supports experimentation.

These issues are especially important for novices, who have limited design precedents, underdeveloped mental schemas, and little experience converting abstract ideas into spatial proposals. They must recognize a design problem, distinguish its givens, requirements, and constraints, test alternatives, transform ideas into concepts, and communicate solutions through drawings, models, and other media. They also need creative and critical thinking, self-reflection, collaboration, and the ability to interpret assessment. The transition toward expertise is therefore a gradual restructuring of knowledge, action, communication, and judgment.

Previous studies have examined design problem-solving, thinking, active and collaborative learning, instructional media, studio culture, critique, and assessment, but treating them separately can obscure their reciprocal influence. This study identifies and organizes educational and environmental characteristics in the literature on introductory architectural design. It asks which characteristics improve novice learning outputs and seeks an integrated framework to guide curriculum designers, instructors, and institutions.

Materials and Methods

The research is applied in purpose and qualitative in nature, using a descriptive-analytical content-analysis method. Data were gathered through library and documentary research. Seventy sources—including books, peer-reviewed articles, journals, and other relevant academic texts on architectural education—were examined. The reviewed material covered the design process, problem-solving, design and critical thinking, the characteristics and needs of novice students, instructional and

representational media, the analysis and criticism of architectural works, assessment in architectural education, and the organization of architectural design studios.

The content analysis proceeded through three interrelated levels. The first, “recognition,” identified recurrent domains influencing novice education by extracting repeated concepts, challenges, and responses. Five high-frequency domains emerged: design and problem-solving; thinking and reflection; understanding the novice learner; the architectural design studio; and assessment. These formed the analytical basis.

At the second level, the extracted data were related, compared, and classified to formulate pedagogical strategies. Recurring items were consolidated into two overarching groups—educational characteristics and educational-environmental characteristics—each comprising three principal dimensions. The third level interpreted the expected studio outputs produced through the development and coordination of these characteristics. In this way, the analysis moved from recognition of the field, to categorical organization and strategy formation, and finally to the description of practical learning outcomes. The method was interpretive rather than statistical; its purpose was to synthesize conceptually rich textual evidence and reveal relationships among dispersed pedagogical themes.

Findings

At the recognition level, five mutually reinforcing domains emerged. Design and problem-solving require students to formulate problems, construct alternatives, and revise both problem and solution. Thinking and reflection include critical, creative, convergent, and divergent thought, interpretation, analysis, evaluation, and inference. Understanding the learner requires attention to limited prior schemas, varied needs, motivation, and developing disciplinary knowledge. The studio supports active learning, shared practice, exploration, discussion, and two- and three-dimensional production. Assessment clarifies expectations, evaluates process and product, and can motivate development through meaningful criteria and feedback.

The second analytical level produced three educational characteristics. The first is design knowledge, which encompasses the selection and interaction of instructional media, the formation and expansion of mental schemas, methods of problem-solving, and the production of architectural concepts. Exposure to books, documents, images, drawings, models, built precedents, and digital or multimedia resources enlarges the beginner’s repository of ideas and supports the translation of knowledge into representation. The second characteristic is designerly thinking: the capacity to transform thought into inhabitable space, participate in criticism of one’s own and others’ work, and use creative analogy to generate appropriate human-made environments. The third is active participation in architectural design, expressed through design inquiry and sustained engagement in studio activities. Students learn more effectively when they investigate, make, discuss, test, revise, and share responsibility for advancing a proposal rather than remaining passive recipients of instruction.

Three environmental characteristics were also identified. First, studios and educational facilities should be flexible, creative, and adequately equipped for varied activities, including individual and group study, sketching, research, model-making, and other two- and three-dimensional explorations. Supporting books and accessible learning resources should also be available. Second, teaching methods should be diverse and should combine theoretical and practical instruction, varied tasks, collaborative experiences, and active-learning strategies. Third, assessment should employ varied and transparent approaches. Effective judgment requires explicit criteria, attention to design process as well as final product, and the participation—when appropriate—of instructors, experts, peers, and students themselves. Reviewing earlier work and receiving structured critique can help novices recognize progress and shortcomings.

At the third level, the coordinated development of these six characteristics was associated with several outputs: producing and describing a final proposal for a hypothetical client; converting thought into two- and three-dimensional architectural representations; learning through designing and making; expanding scientific and disciplinary knowledge; building a repository of precedents and ideas; recognizing and refining one's own ideas by observing completed work; generating and testing design alternatives; and sustaining dialogue between students and instructors. Together, these outcomes support ideation, design skill, motivation, and the gradual transition from novice to more expert performance.

Discussion and Conclusion

The findings indicate that the quality of novice architectural education cannot be explained solely by curriculum content or by the physical studio considered in isolation. Educational and environmental characteristics operate as a coordinated system. Clear goals, design knowledge, active participation, structured critique, and meaningful assessment become more effective when the studio enables exploration, making, interaction, and access to appropriate resources. Conversely, a well-equipped environment cannot improve performance if students remain passive, tasks are disconnected from learning objectives, or evaluation criteria are unclear.

The framework also explains why the studio should approximate selected conditions of practice without demanding expert performance. Hypothetical projects let students interpret a brief, develop alternatives, communicate with a presumed client, and present a defensible proposal. Dialogue, peer feedback, built projects, documents, and precedents expand mental schemas and connect knowledge with action. Critique should support reflection and revision, while assessment should examine knowledge, process, representation, participation, and product.

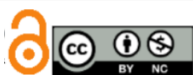
The central conclusion is that a deliberate alignment of educational programming with the educational environment can facilitate and accelerate the acquisition of design skills. Introductory studios should enable students to study, form schemas, use technical and exploratory representation, generate ideas,

develop concepts, translate concepts into space, make models, receive feedback, and refine proposals through interaction. These activities simultaneously shape the student's identity as a designer and prepare the learner for architectural practice and the construction sector.

This alignment is not a fixed teaching formula. It requires instructors to adjust tasks, media, interaction, and feedback to students' developing abilities while preserving a clear sequence from inquiry and ideation to representation, evaluation, and final communication.

Accordingly, introductory courses should operate as integrated learning ecosystems in which objectives, activities, media, critique, assessment, space, and resources complement one another. Flexible areas for collaboration and fabrication, active teaching, explicit criteria, and self-, peer-, and instructor assessment are especially important. This literature-based conceptual synthesis does not experimentally test causality, but it offers a basis for reviewing studio curricula and environments. Future research can test the framework across institutions, teaching cultures, and resource conditions.

Keywords: Novice architecture students; Architectural education; Educational characteristics; Environmental characteristics; Architectural design studio; Design thinking; Active learning; Assessment



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