




 Review Article

A Systematic Review of Educational Strategies for Enhancing Creativity in Architecture Design Studios

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Abstract

This systematic literature review examines educational strategies for enhancing creativity in architectural design studios, synthesizing findings from 24 peer-reviewed studies published between 2015 and 2025. Architectural education has long positioned the design studio as the ideal environment for fostering creativity. However, the increasing integration of digital tools, diverse pedagogical frameworks, and new models of collaboration has reshaped both opportunities and challenges for cultivating innovative thinking. The review highlights a range of pedagogical approaches, such as design thinking models, technology-enhanced learning, experiential and “learning by doing” approaches, and collaborative methods that encourage peer-to-peer and interdisciplinary engagement. Key findings indicate that hybrid models blending structured frameworks with open-ended exploration effectively support the development of creative skills, while the use of digital tools promotes innovation but also risks restricting the design thinking of students if applied uncritically. One critical issue the review highlights concerns the assessment of creativity: despite growing interest in the evaluation of creativity, assessment practices remain inconsistent. Another critical issue the review highlights is the tension between technology and human agency, revealing a need for more balanced pedagogical approaches that value both digital innovation and human-centred exploration. Limitations of the study include the exclusion of potentially relevant studies because of the scope of the database search, a geographical bias toward Western contexts, and a scarcity of longitudinal studies on the sustained impact of creativity-focused strategies on architecture students. The study concludes by underscoring the importance of context-sensitive strategies that harmonize structure and freedom, tradition and innovation, and individual and collaborative learning. By addressing these challenges, architectural educators can better equip students to meet the evolving demands of the architecture profession.

Keywords: Architectural Education, Architecture, Creativity, Design Studio, Educational Strategies

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1. INTRODUCTION

Across all ages and environments, creativity remains a vital pillar of global education, indispensable for learning, employment, and life in general (Aquiye-Mansill et al., 2025). In particular, creativity, which involves the production of novel and useful ideas (Kaufman & Beghetto, 2020), is central to architectural education. This is particularly manifest within the design studio, where students explore, experiment, and develop innovative solutions to design problems (Xhambazi & Aliu, 2024). Creativity fosters problem-solving, critical thinking, and the ability to address complex spatial, environmental, and social issues (Medina-Sánchez et al., 2017). The studio environment simulates professional practice, encouraging iterative design and client-oriented problem solving (Al-Rqaibat et al., 2025). As architecture becomes increasingly complex, combining issues surrounding technology, sustainability, and culture, nurturing creativity is essential for preparing students for future demands (Casakin & Wodehouse, 2021). Fostering

creativity in design studios is therefore not only a matter of pedagogy, but also vital for professional practice as it shapes adaptable and forward-thinking architects.

Despite widespread recognition of its importance, there is no consensus on which educational strategies most effectively foster creativity among architecture students (Salami, 2021). While design studios vary widely in format, pedagogy, and cultural context (Hewidy et al., 2023), the methods employed to promote creativity are often inadequately assessed (Wilson & Zamberlan, 2017). Furthermore, emerging tools such as generative Artificial Intelligence (AI), gamification, and digital platforms have introduced new opportunities, yet fragmented findings and inconsistent assessments of “creativity” make it difficult to compare results across studies (Paananen et al., 2023). As a result, there is a critical need to synthesize existing literature to identify, evaluate, and categorize the educational strategies that have been shown to enhance creativity in architecture design studios.

This paper conducts a systematic literature review to investigate educational strategies used in architecture design studios to enhance student creativity. It aims to synthesize current theoretical perspectives across architectural research and design theory. By doing so, the paper seeks to answer the following research questions:

- a) What educational strategies have been employed to enhance creativity in architecture design studios?
- b) How is creativity measured in the reviewed literature?
- c) What are the impacts of these strategies on the creative thinking of students?
- d) What gaps or inconsistencies exist in the current research on fostering creativity through studio-based approaches in architecture education?

The paper is structured as follows. The next section explains the methodology used for the study, outlining the requirements for a systematic literature review and explaining the methods used to gather and synthesize data. Following that is the main systematic review section, where different theoretical perspectives on educational strategies used to enhance creativity in architecture design studios are analysed. The synthesis section delves into the critical issues the review uncovers, its implications for future curriculum development and teaching practices in architecture education, and limitations of the study. The paper concludes by presenting a summary of the findings and areas for future research.

2. METHODOLOGY

To answer the research questions, a systematic literature review is adopted. There are two reasons for choosing a systematic literature review for this study. First, given the lack of consensus on the effectiveness of educational strategies to enhance creativity in architecture design studios, a systematic review allows the synthesis of insights from diverse sources to form a coherent framework (Kraus et al., 2020). Second, a systematic literature review makes it possible to explore interdisciplinary perspectives (Burgers et al., 2019), as this topic touches on multiple areas of study, including architectural pedagogy, design theory, and creative thinking. The review follows three steps: rigorous data collection, coding and analysis, and synthesis of findings (Xiao & Watson, 2019).

2.1. Step 1: Data Collection

The data collection was carried out on the Google Scholar database. It was selected for its broad scope and inclusion of less common perspectives (Heigl, 2025), as opposed to traditional databases like ScienceDirect. The broad scope ensured that relevant studies from architecture, cognitive science, and technology were all captured in one place. Additionally, systematic literature reviews are supposed to be replicable (Page et al., 2021). Many specialised databases require institutional subscriptions. Google Scholar offers the accessibility needed for researchers without institutional access to replicate the research.

Based on the research questions, keywords related to educational strategies employed to enhance creativity in architecture design studios were constructed. An advanced search was run for articles with the words “creativity” and “education” and at least one of the words “architecture” OR “architectural” in the title. This was done to limit the scope of the data to the relevant field of architecture, as creativity in

pedagogy is increasingly being explored across diverse research areas, including art education, engineering, and general learning approaches (Sari, 2023).

A systematic literature review requires the development of inclusion and exclusion criteria to determine the relevance of data (Snyder, 2019; Xiao & Watson, 2019). Based on the objectives of the research, only studies that met the following criteria were included: (i) published between 2015 and 2025, and (ii) peer-reviewed. The focus on studies published within the last 10 years was to make sure the latest literature on the topic was covered (Booth et al., 2016). Architectural pedagogy is undergoing rapid transformation (El Moussaoui, 2025; Mance, 2025). When a field is undergoing rapid transformation, researchers may restrict the time period of a systematic review to ensure the review reflects the current state of knowledge (Snyder, 2019). The focus on peer-reviewed studies was to make sure studies that had credibility and rigor were used (Snyder, 2019).

Studies that were excluded were: (i) not available as full text, (ii) not published in the English language, and (iii) focused on students outside the context of the architectural design studio. Studies that were not available as full text were excluded to make the study transparent and easily replicable (Xiao & Watson, 2019). Studies that were not published in English were excluded because of the authors' language proficiency (Heigl, 2025). Studies that focused on pedagogy outside the context of the architectural design studio were excluded because they fell outside the scope of the research questions (Casakin & Wodehouse, 2021).

126 studies were initially retrieved after the defined search terms were run on Google Scholar. After the inclusion and exclusion criteria were applied, 18 studies remained. Finally, a backward-forward search was run to identify additional relevant studies that met the inclusion criteria (Heigl, 2025). The backward search involved reviewing the references in the selected studies to find other relevant studies, while the forward search involved reviewing the citations of the selected studies and retrieving additional relevant studies. After the backward-forward search, 6 more studies that met the inclusion criteria were included. In total, 24 studies matched all the criteria and were used for the systematic review.

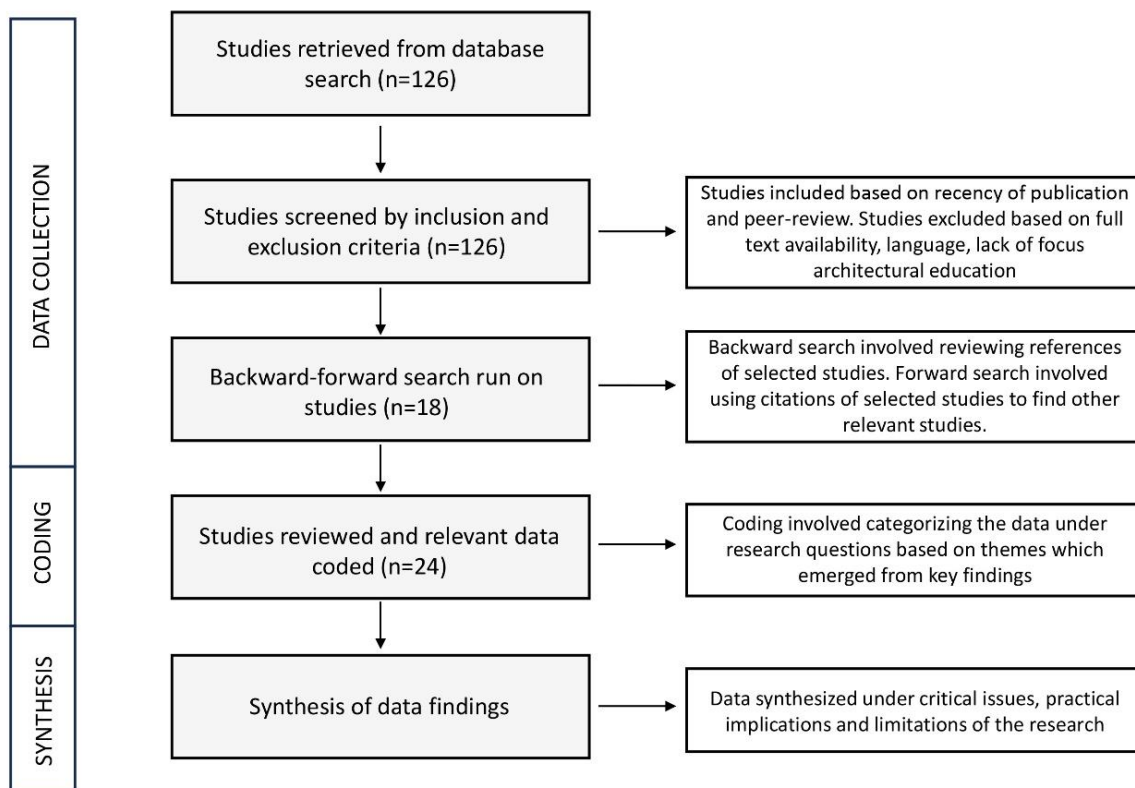


Figure 1. Flowchart Summarizing the Approach to Collect, Analyse, and Synthesize Data

2.2. Step 2: Coding and Analysis

The coding and analysis involved examining selected studies to identify recurring themes related to educational strategies used to foster creativity in architecture design studios. The emerging themes were then categorized to align with the research questions (Saldaña, 2015). There was a detailed analysis of each theme to establish its scope and focus to determine how it provided answers to the research questions (Braun & Clarke, 2021).

2.3. Step 3: Synthesis of Data

The synthesis of the findings followed the three-phase process by Hattie (2017): identifying critical issues, interpreting practical implications, and acknowledging boundary conditions. This is in line with the established structure of problem-solution-limitations in educational research. Figure 1 shows the process used to collect, analyse, and synthesize the data.

3. RESULTS

3.1. Details on Selected Articles

As shown in Fig. 2, there has been an upward trend in the number of publications focusing on educational strategies to enhance creativity in the context of the architecture design studio over the last 10 years. This means it is increasingly becoming an area of scientific focus. In this study, the articles were categorized into research themes to address the four research questions. The analysis revealed 15 main themes: 6 under the educational strategies to enhance creativity in architecture design studios, 2 under the evaluation of creativity, 3 under the impact of the strategies on the creativity of students, and 4 under the gaps and inconsistencies in the current research.

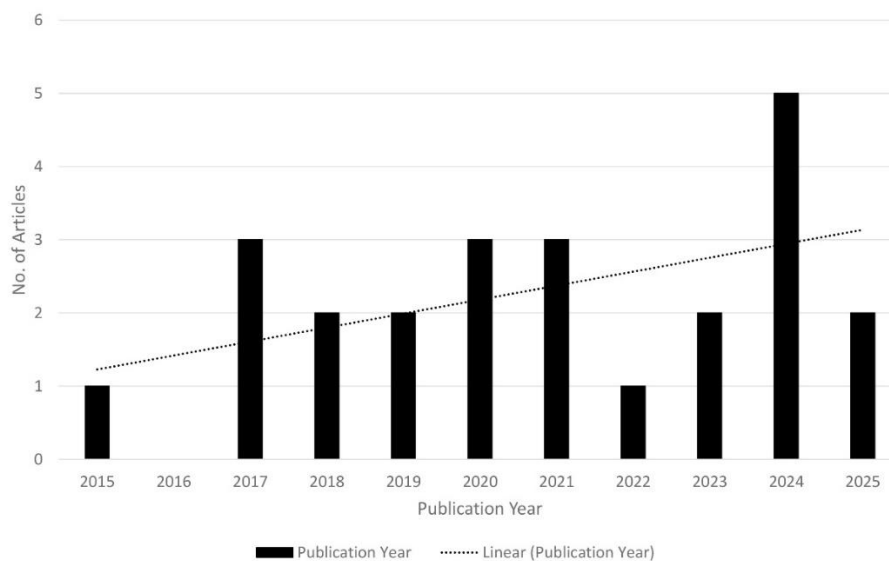


Figure 2. Publication Years of Selected Articles (n=24)

Table 1 below shows the categories and themes that emerged from the selected studies. The remainder of this section is organized according to the 4 categories.

3.2. Category I: Educational Strategies Employed to Enhance Creativity

The first category addresses the educational strategies that have been employed to enhance creativity in architecture design studios. Themes which emerged under this category include: design thinking models, technology-enhanced strategies, experiential learning or “learning by doing”, collaborative methods, biophilic design, and heritage-driven methods.

Table 1. Categories and Themes Which Emerged from the Selected Studies

THEME	1. Alqaova	2. Almaz	3. Al-Rqabat	4. Casakin	5. Daemei	6. Dall'Asta	7. Danaci	8. Gębczyńska	9. Gregor	10. Gungor	11. Hamilloğlu	12. Hassankhouel	13. Karvan	14. Kaya	15. Korra	16. Mendoza	17. Nyka	18. Soliman	19. Tedjari	20. Tepeučević	21. Życzkowska	22. Życzkowska	23. Życzkowska	24. Życzkowska
I Educational strategies employed to enhance creativity <ul style="list-style-type: none"> Design thinking models Technology-enhanced strategies Experiential learning or "learning by doing" Collaborative methods Biophilic design Heritage-driven methods 	X	X	X	X	X	X		X	X					X		X	X		X		X			
II The evaluation of creativity <ul style="list-style-type: none"> Conceptualizing creativity Evaluation methods 			X	X		X	X		X	X		X	X	X	X		X		X					X
III Impact on the creativity of students <ul style="list-style-type: none"> Enhancement of creative thinking Improvement in design performance Challenges 		X				X	X								X	X	X							
IV Gaps and inconsistencies in the current research <ul style="list-style-type: none"> Lack of longitudinal research Overemphasis on tools rather than pedagogy Inconsistent approach to measuring creativity Cultural limitations 	X		X	X		X						X												X

3.2.1. Design Thinking Models

Design thinking models, which were identified in the literature as frameworks to enhance creativity in architecture design studios, include the Divergent-convergent Thinking Model, Project-based Models, and Human-centred Models.

- Divergent-Convergent Thinking Model:** Three papers touch on divergent-convergent models in architectural education. Kaya & Bilgiç (2020) review two ways of design thinking – a concrete way of thinking (convergent) and an open, subjective way of thinking (divergent). Casakin & Wodehouse (2021) make the case that idea generation (divergent) and solution refinement (convergent) are core to creative processes. Gregor (2021) argues that during brainstorming, free-flowing ideas should not be suppressed or criticised (divergent), but they should be balanced with the quality of ideas (convergent).
- Project-based Models:** Project-based models were also highlighted in literature as an effective way of fostering creativity in architectural education. Nyka et al. (2020) apply the CDIO framework (Conceive-Design-Implement-Operate) to architectural education, structuring studios into phases from concept development to real-world evaluation. Dall'Asta (2025) examines AI-enhanced project-based learning, where students use AI as an inspiration generator, co-designer, and collaborative team member to enhance creativity. Mendoza et al. (2018) focus on deployable structures, with students “learning by doing” through hands-on construction and material analysis, enhancing creative thinking and structural understanding.
- Human-centred Models:** Human-centred models are effective in architectural education in fostering creativity. Dall'Asta (2025) demonstrates how AI can be woven into Human-Centred Design (HCD) by making designs user-focused. The findings highlight how AI can augment HCD to enhance creativity. Tedjari et al. (2024) argue that merging nature with the well-being of users of a space enhances originality in student projects, thereby fostering creativity.

3.2.2. Technology-Enhanced Strategies

Generative AI and similar tools automate technical tasks, allowing students to explore unconventional solutions while ensuring feasibility (Dall'Asta, 2025; Almaz et al., 2024). Dall'Asta (2025) suggests that AI tools can come up with design alternatives based on user behaviour data, merging creativity with functionality. Virtual and augmented reality (VR/AR) also play a pivotal role in immersive design. Gębczyńska-Janowicz (2020) makes the case that VR enables students to visualize and refine spatial experiences in real-time, while Życzkowska et al. (2024) demonstrate how a 3D Visualization Laboratory

enables students to verify designed concepts in motion and in the right proportion, encouraging imagination.

Parametric design and digital fabrication tools encourage experimentation with complex geometries and rapid prototyping. Daemei and Safari (2018) demonstrate that parameters, including computer-aided design, can serve as powerful tools to enhance creativity, whereas Mendoza et al. (2018) emphasize how technology-assisted fabrication empowers students to be more explorative with complex forms, making them more creative. Al-Rqaibat et al. (2025) emphasize that hybrid approaches enhance designer-tool interaction, positively impacting the creativity of students.

3.2.3. Experiential Learning or “Learning by Doing”

Mendoza et al. (2018) present findings on a Deployable Structures Project developed at Nottingham Trent University School of Architecture, which proves that using hands-on construction to test theoretical concepts enhances students’ creativity. This tactile engagement not only reinforces structural principles but also enhances creative problem-solving by requiring students to adapt designs in real time. Similarly, Nyka et al. (2020) integrate experiential learning within the CDIO framework, particularly in the “Implement-Operate” phases, where students transition from digital modelling to physical prototyping, identifying discrepancies between virtual designs and real-world projects. Gębczyńska-Janowicz’s (2020) makes the case that technology has expanded the scope of experiential learning, demonstrated in a study on virtual reality (VR). Students “experience” unbuilt designs through immersive simulations, allowing them to iteratively test design concepts – a digital extension of traditional hands-on learning. Al-Rqaibat et al. (2025) further demonstrate how hybrid digital-physical workflows encourage testing and comparison of solutions, leading to innovative problem-solving. Again, Tedjari et al. (2024) observe that biophilic design projects involving live plant integration and manual modelling yield more creative solutions than purely digital workflows.

3.2.4. Collaborative Methods

Collaboration enhances creative outcomes through the inclusion of diverse perspectives (Casakin and Wodehouse, 2021). Mendoza et al. (2018) argue that group projects involving deployable structures improve students’ ability to negotiate complex design constraints collectively. The CDIO framework, as discussed by Nyka et al. (2020), incorporates collaborative work by students into its “Conceive” phase, and also shows how feedback from critics from diverse backgrounds provides much-needed interdisciplinary input.

Digital tools have significantly expanded collaborative possibilities. Dall’Asta (2025) examines AI-assisted teamwork, showing that AI enhances multidisciplinary teamwork by managing complex tasks and ensuring the final design is innovative. Again, Almaz et al. (2024) make the point that AI provides design flexibility for multidisciplinary collaboration.

3.2.5. Biophilic Design

Biophilic design, which integrates natural elements into the built environment, emerged in one study as a way to stimulate creativity while addressing sustainability and human well-being. Tedjari et al. (2024) demonstrate that students working with live plants, natural light, and organic materials develop more original and user-centred solutions compared to those relying solely on digital tools.

3.2.6. Heritage-Driven Methods

Heritage-driven methods, which draw from historical and cultural contexts, also foster creativity. Akçaoğlu & Sungur (2024) examine the use of Islamic geometric patterns in design studios, showing that students who reinterpreted traditional motifs and added contemporary touches came up with more creative designs and developed conceptual depth. Życzkowska et al. (2024) further demonstrate how VR

reconstructions of heritage sites enabled students to reimagine historical structures with contemporary interventions, blending cultural continuity with futuristic design.

3.3. Category II: The Evaluation of Creativity

The second category addresses how creativity is evaluated in architectural education, highlighting the complexity of measuring and enhancing creative thinking in design pedagogy. Themes which emerged under this category include: conceptualizing creativity, evaluation methods and challenges, and creativity debates.

3.3.1. Conceptualizing Creativity

The papers identified three lenses through which creativity in architectural education is conceptualized:

- a. **Process-Based Perspectives:** Several studies emphasize creativity as a cognitive and iterative process. Casakin & Wodehouse (2021) describe creativity as not simply an innate attribute, but as a tendency that can be nurtured in a systematic manner, and applied through procedural methods. This aligns with Gregor's (2021) findings that creativity involves looking for new methods of problem solving by "combining ideas that previously seemed unrelated". Again, Gungor & Yorgancioglu (2019) considered the design process in analysing students' creativity as they worked on their projects. The CDIO framework, as discussed by Nyka et al. (2020), formalizes this process through its four-phase model, particularly emphasizing the transition from abstract conception to concrete implementation.
- b. **Product-Based Perspectives:** Other studies frame creativity through its outcomes. Hassankhouei et al. (2021) developed a product creativity evaluation model assessing originality, functionality, and aesthetic value in final designs. Similarly, Gungor & Yorgancioglu (2019) analyse creativity through studio outputs, measuring both quantitative and qualitative data in student portfolios.
- c. **Impact-Based Perspectives:** Other studies frame creativity through its impact. Tedjari et al. (2024), based on their findings, make the case that architectural education should be reevaluated to produce creative architects exploring environmentally-conscious designs. Also, Dall'Asta (2025) makes the case that human-centred design encourages architects to "create more thoughtful and inclusive spaces". It encourages students to design with a comprehensive approach, considering usability, accessibility, and aesthetics to respond to human needs.

3.3.2. Evaluation Methods

The literature identifies multiple approaches to evaluate the creativity of architecture students:

- a. **Traditional Jury Systems:** Several of the studies acknowledge the continued dominance of studio critiques as a way of evaluating the creativity and design performance of students (Tedjari et al., 2024; Korra et al., 2022; Gungor & Yorgancioglu, 2019; Danaci, 2015). Danaci (2015) argues that variables such as cognitive, personal, and environmental are crucial for students to be successful at design. Danaci (2015), however, emphasizes that without technical skills like technical drawing skills, students will not be assessed as successful in design even if they have innate creativity. Hassankhouei et al. (2021) also note that there are inconsistencies in the criteria used by tutors to evaluate studio projects. Similarly, Tedjari et al. (2024) argue that studio assessments conducted by tutors need to be reevaluated to include biophilia integration.
- b. **Cognitive Methods:** Some studies acknowledge and integrate creativity metrics from cognitive science into architectural education. Karvan (2023) adapts the Three-Dimensional Wisdom Scale, the Kirton Adaptor-Innovator Questionnaire, and the Self-Directed Learning Scale to evaluate design thinking. Also, Hassankhouei et al. (2021) developed a product creativity evaluation model assessing originality, functionality, and aesthetic value in final designs. Again, Kaya & Bilgiç (2020) make the case that creativity can be revealed by assessing qualitative and quantitative criteria, by distinguishing convergent and divergent thinking in concept development.

- c. **Technology-Enhanced Assessments:** With the emergence of new digital tools, some studies have looked into how they can be used to evaluate creativity. Al-Rqaibat et al. (2025)'s findings support using a hybrid digital toolkit to evaluate and compare creative solutions to design problems. Also, Korra et al. (2022) make the case that students should be assessed not only on their design abilities but also on their ability to use AI tools to make data-driven decisions, to create an intersection between creativity and technology. Again, Życzkowska & Urbanowicz (2019) note that students can use digital tools to analyse the consequences of their design decisions and improve their projects through iteration.

3.4. Category III: Impact on the Creativity and Performance of Students

The third category addresses the impact of the educational strategies on the creativity and performance of students. Themes which emerged under this category include: enhancement of creative thinking, improvement in design performance, and challenges.

3.4.1. Enhancement of Creative Thinking

Several studies highlight how structured educational approaches foster creative thinking among architecture students. AI and generative design tools allow students to rapidly explore unconventional solutions while ensuring feasibility (Dall'Asta, 2025; Almaz et al., 2024; Korra et al., 2022). Experiential learning enhances tactile creativity, helping students bridge abstract concepts and real-world applications (Nyka et al., 2020; Mendoza et al., 2018). VR and AR further support this by enabling iterative spatial testing (Gębczyńska-Janowicz, 2020). Group projects (Mendoza et al., 2018) and multidisciplinary teamwork (Dall'Asta, 2025) also enhance creative thinking by exposing students to diverse perspectives and encouraging innovative problem-solving.

3.4.2. Improvement in Design Performance

The reviewed studies also link educational strategies to measurable improvements in design quality and human-centred outcomes. Parametric modelling (Daemei & Safari, 2018) and AI-driven tools (Korra et al., 2022) improve students' ability to synthesize data from numerous sources, tailored to the specific demands of their design projects. This leads to measurable improvement in design performance (Korra et al., 2022). Biophilia integration (Fedjari et al., 2024) and human-centred design (Dall'Asta, 2025) also improve the quality and innovativeness of students' designs. Structured frameworks like the CDIO model (Nyka et al., 2020) provide clear workflows that help students balance creativity with feasibility, reducing instances of impractical proposals.

3.4.3. Challenges

Despite these benefits, there are certain trade-offs associated with some of the educational strategies. Dall'Asta (2025) argues that there is the possibility that AI could overshadow human creativity and be used as a substitute rather than as a tool to augment human agency. Similarly, Al-Rqaibat et al. (2025) note that integrating digital tools may unintentionally restrict design thinking if not implemented carefully. There are also ethical issues like user consent and data privacy, which must be addressed as AI tools get introduced in design studios (Dall'Asta, 2025).

3.5. Category IV: Gaps and Inconsistencies in the Current Research

The selected papers acknowledge several gaps in studying strategies to enhance creativity in architectural education. A recurring concern is the lack of longitudinal research. Casakin and Wodehouse (2021) note that there is a large number of investigations in the field of engineering design on creative design education, but few in the field of architecture. Al-Rqaibat et al. (2025) also note that long-term impacts of hybrid tools on students' creativity and design performance have not been studied.

Another significant gap identified in the studies is the overemphasis on tools rather than pedagogy. Życzkowska and Urbanowicz (2019) assert that it is crucial to follow digital innovations, but also integrate

them into the education curriculum. Similarly, Dall'Asta (2025) argues that architectural education should embrace AI tools, but integrate them into human-centred design to better equip future architects to address human needs, as well as sustainability.

Another research gap is the inconsistent approach to measuring creativity. Hassankhouei et al. (2021) note that there are inconsistencies in the criteria used by tutors to evaluate studio projects. Similarly, Gungor and Yorgancioglu (2019) argue that “consensual assessment technique (CAT) is the most extensively used method for assessing creative products”, though Danaci (2015) makes the observation that without technical skills like technical drawing skills, students will not be assessed to be successful in design even if they have innate creativity.

Cultural limitations represent another gap identified. Akçaova and Sungur (2024) emphasize that more study is necessary to fully understand how to incorporate heritage-driven methods into architectural education.

4. SYNTHESIS OF FINDINGS

This systematic literature review examined educational strategies for fostering creativity in architectural design studios and looked into their conceptual foundations, impact on students, and gaps in current research. The findings reveal both promising approaches and critical challenges that need addressing. This discussion synthesizes these insights under three key themes: (1) critical issues identified in the review, (2) implications for curriculum development and teaching practices, and (3) limitations of the study.

4.1. Critical Issues Identified in the Review

4.1.1. Tensions Between Technology and Human Agency

A recurring theme across the literature is the conflict between digital tools and human creativity. While digital tools can come up with numerous design alternatives based on relevant parameters, as well as give students the opportunity to explore unconventional solutions to design problems (Dall'Asta, 2025; Almaz et al., 2024; Życzkowska et al., 2024; Gębczyńska-Janowicz, 2020), they may also unintentionally restrict the design thinking of students if they are used as a substitute for human creativity (Dall'Asta, 2025; Al-Rqaibat et al., 2025).

4.1.2. Inconsistency in Creativity Assessment

The dominance of traditional jury critiques (Tedjari et al., 2024; Korra et al., 2022; Gungor & Yorgancioglu, 2019; Danaci, 2015) remains problematic due to inconsistencies in the criteria used by tutors to evaluate studio projects (Hassankhouei et al., 2021). This problem can be mitigated by integrating cognitive metrics (Karvan, 2023; Hassankhouei et al., 2021) and digital evaluation tools (Al-Rqaibat et al., 2025; Korra et al., 2022).

4.2. Implications for Curriculum Development and Teaching Practices

4.2.1. Toward Hybrid Educational Models

The review suggests that blending structured and exploratory approaches effectively supports creativity. Divergent thinking should be balanced with convergent thinking (Casakin & Wodehouse, 2021; Gregor, 2021). Free-flowing ideas that come up during brainstorming should not be suppressed, but they should converge to form quality ideas. Also, modular courses which integrate explorative tools (Al-Rqaibat et al., 2025), as well as models which integrate human-centred (Dall'Asta, 2025; Korra et al., 2022) and environmentally-conscious designs effectively support creativity (Tedjari et al., 2024). Curriculum developers should therefore develop courses that blend structured frameworks with open-ended exploration to effectively foster the creativity of students.

4.2.2. Toward Hybrid Digital Tools

The review suggests that merging digital tools with human agency is the best approach to enhance the creativity of students. Digital tools must augment human creativity at various stages of the design process, not replace it (Al-Rqaibat et al., 2025; Dall'Asta, 2025). Again, digital tools must be paired with physical workflows to solve real-world problems (Al-Rqaibat et al., 2025; Nyka et al., 2020).

4.2.3. Enhancing Creativity Assessment

The review suggests ways to address the challenges associated with the traditional jury system method used in evaluating the creativity of students. Educators need to implement ongoing critiques (Gungor & Yorgancioglu, 2019), rather than high-stakes final reviews. Educators also need to integrate multidimensional rubrics to assess students' work, including process-based (Nyka et al., 2020; Gungor & Yorgancioglu, 2019), product-based (Hassankhouei et al., 2021; Gungor & Yorgancioglu, 2019), and impact-based (Dall'Asta, 2025; Tedjari et al., 2024) evaluations.

4.3. Limitations of the Study

This systematic literature review is subject to several limitations. First, the scope of the search and the choice of keywords may have excluded potentially relevant studies, particularly those not indexed in the selected database. Second, there is a geographical bias in the reviewed literature; the majority of studies were conducted in Western contexts, limiting the generalizability of the findings to other cultural and educational settings. Third, methodological limitations were noted, as lack of longitudinal studies on the impact of the strategies identified on the creativity of architecture students.

Despite these limitations, efforts were made to minimize their impact through clear criteria, independent inclusion and exclusion criteria, a defined timeframe, and thorough cross-checking of selected studies to enhance the rigor and reliability of the findings.

5. CONCLUSION

This systematic literature review has synthesized contemporary research on educational strategies to enhance creativity in architectural design studios, revealing key insights and persistent challenges. The findings demonstrate that structured yet flexible approaches, as well as hybrid methods that merge digital tools with human agency, effectively foster creativity among architecture students.

The review identifies critical issues in current research, including tensions between digital tools and human agency, as well as inconsistencies in the assessment of students' creativity. The implications for curriculum development and teaching practices include adopting hybrid educational models, merging digital tools with human agency, and enhancing creativity assessments.

The findings of this review offer guidance to various stakeholders in architectural education. Educators should adopt hybrid pedagogical models that combine structured methods with open-ended exploration. They should also facilitate the use of digital tools to augment human creativity, rather than replacing it. Educators should also employ ongoing critiques to assess students, rather than final jury reviews. For curriculum designers, the review underscores the need to develop modular courses that integrate exploratory and human-centred approaches to foster the creativity of students. Curricula should also provide the flexibility for experiential and collaborative learning. Technology developers have a critical role in collaborating with educational institutions to design hybrid digital tools that align with the pedagogical goals of design studios. For policymakers, the review underscores the need to support capacity-building programs to enhance the digital literacy of educators and facilitate research funding for studies that explore creativity enhancement in architectural education.

Limitations of this review include the exclusion of potentially relevant studies because of the scope of the search and the choice of keywords. There is also a geographical bias, as the majority of the studies were conducted in Western contexts, limiting the generalizability of the findings. Finally, there was a lack of longitudinal studies on the impact of the strategies identified on the creativity of architecture students.

Future research should undertake cross-cultural comparative analyses to explore how diverse educational and cultural approaches can influence creative development among architecture students. Also, future studies should look into the development of standardized metrics for assessing creativity in design education. Additionally, longitudinal studies are necessary to examine the long-term effects of the educational strategies on the creativity of architecture school graduates.

In conclusion, nurturing creativity in architectural education requires nuanced, context-sensitive strategies that harmonize structure and freedom, tradition and innovation, and individual and collaborative learning. By addressing these challenges, educators can better equip students to meet the evolving demands of the architecture profession.

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Research Ethics. This study did not require institutional ethical approval. The review was conducted using publicly available, peer-reviewed literature. All sources have been appropriately cited to ensure academic integrity, and the review followed established guidelines for transparency and ethical reporting in systematic reviews.

Data Availability Statement. All data can be obtained from the corresponding author.

Conflicts of Interest. The author declares no conflicts of interest.

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Appendix 1. Systematic Literature Review Papers

Paper No.	Authors	Year	Title
1	Akçaova	2024	A contemporary interpretation of abstraction and creativity through Islamic patterns in design education
2	Almaz	2024	The future role of Artificial Intelligence (AI) design's integration into architectural and interior design education is to improve efficiency, sustainability, and creativity
3	Al-Rqaibat	2025	Enhancing architectural education through hybrid digital tools: investigating the impact on design creativity and cognitive processes
4	Casakin	2021	A Systematic Review of Design Creativity in the Architectural Design Studio
5	Daemei	2018	Factors affecting creativity in the architectural education process based on computer-aided design
6	Dall'Asta	2025	Integrating artificial intelligence into the human-centered design process: enhancing creativity and user-centricity in architectural education
7	Danaci	2015	Creativity and knowledge in architectural education
8	Gębczyńska-Janowicz	2020	Virtual reality technology in architectural education
9	Gregor	2021	Methods and techniques supporting creativity in architectural education
10	Gungor	2019	Analysis of the creativity development and assessment of architectural design education: A case study of basic design studio
11	Hamiloglu	2017	Creativity in architectural education
12	Hassankhouei	2021	Design and validation product creativity evaluation model in architectural design education
13	Karvan	2023	Developing a Design Thinking Model of Architectural Education Based on Wisdom and Creativity Styles Mediated with Self-Directed Learning
14	Kaya	2020	The process of creativity and concept development in interior architecture design education
15	Korra	2022	Transformative Approaches in Architectural Education: Leveraging Artificial Intelligence for Enhanced Design, Creativity, and Technical Integration
16	Mendoza	2018	Learning by doing: Fostering creativity in the teaching and learning of deployable structures in architectural education
17	Nyka	2020	The CDIO model in architectural education and research by design
18	Soliman	2017	Appropriate teaching and learning strategies for the architectural design process in pedagogic design studios
19	Tedjari	2024	Integrating biophilia in architectural design education: an examination of its impact on students' creativity
20	Tepavčević	2017	Design thinking models for architectural education
21	Życzkowska	2024	Virtual tour as an innovative tool for architectural education-from understanding heritage to creativity stimulation
22	Życzkowska	2024	Revision of architectural design education in terms of sustainability, creativity and digitalisation
23	Życzkowska	2023	Levels of creativity in architectural education
24	Życzkowska	2019	Architectural education in the context of the development of digital tools - challenges and opportunities