METHODOLOGICAL VISION IN ARCHITECTURAL DESIGN: TOWARDS A NEW INTEGRATIVE PERSPECTIVE
VISIÓN METODOLÓGICA EN EL DISEÑO ARQUITECTÓNICO: HACIA UNA NUEVA PERSPECTIVA INTEGRADORA

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	ABSTRACT
Keywords: classical methodologies, design thinking, creativity, interdisciplinarity, innovation.	In the field of architectural design, the evolution of methodologies has been an ongoing process, from traditional approaches focused on linear teaching and master-apprentice learning to the integration of design thinking and interdisciplinary approaches. This review study analyzes the need to transcend classical methodologies towards a new vision that responds to contemporary challenges, such as sustainability, digitalization and the personalization of spaces. Through the systematic literature review between 2018 and 2024, the limitations of traditional approaches are identified, and a renewed methodological vision is proposed that incorporates creativity, innovation and interdisciplinary collaboration, all under an integrative perspective. It is concluded that the adoption of new methodologies is essential to bridge the gap between theory and practice, ensuring that architectural designs respond to user expectations and current social demands. This article is a partial synthesis of a broader research developed within the framework of the doctoral thesis called "Methodological proposal for architectural design with a systemic approach applicable to the architect's project processes. ARCHITECTURAL DESIGN THINKING SYSTEM: Thinking System for Architectural Design".

	RESUMEM
Palabras clave: metodologías clásicas, pensamiento de diseño, creatividad, interdisciplinariedad, innovación.	En el ámbito del diseño arquitectónico, la evolución de las metodologías ha sido un proceso continuo, desde los enfoques tradicionales centrados en la enseñanza lineal y el aprendizaje maestro-aprendiz hasta la integración del pensamiento de diseño y el enfoque interdisciplinario. Este estudio de revisión analiza la necesidad de trascender las metodologías clásicas hacia una nueva visión que responda a los desafíos contemporáneos, como la sostenibilidad, la digitalización y la personalización de los espacios. Mediante la revisión sistemática de literatura entre 2018 y 2024, se identifican las limitaciones de los enfoques tradicionales y se propone una visión metodológica renovada que incorpora la creatividad, la innovación y la colaboración interdisciplinaria, todo esto bajo una perspectiva integradora. Se concluye que la adopción de nuevas metodologías es esencial para cerrar la brecha entre teoría y práctica, asegurando que los diseños

arquitectónicos respondan a las expectativas de los usuarios y a las demandas sociales actuales. Este artículo es una síntesis parcial de una investigación más amplia desarrollada en el marco de la tesis doctoral denominada "Propuesta metodológica para el diseño arquitectónico con enfoque sistémico aplicable a los procesos proyectuales del arquitecto. ARCHITECTURAL DESIGN THINKING SYSTEM: Sistema de pensamiento para el Diseño Arquitectónico".

Introduction

Architectural design, since its origins, has reflected the aesthetic, social and technological aspirations of each era. However, the changes it has faced in recent decades have led to a rethinking of its methodologies. Traditionally, the design process was structured under rigid models, such as the master-apprentice method and sequential learning in workshops (López Terrazas, 2021; Morales-Holguín and González-Bello, 2020; Ozturk, 2020). These approaches, although effective at the time, have shown limitations in the face of contemporary challenges, such as sustainability, technological integration, and meeting the dynamic needs of end users (Rodriguez and Fiscarelli, 2023; Rodriguez et al., 2022).

During the 20th century, the Modern Movement, with figures such as Walter Gropius and the Bauhaus, promoted a functionalist approach, where hands-on learning in workshops and the standardization of construction processes dominated teaching (Salama and Burton, 2022). This approach had a great impact on architectural production, but it failed to establish a solid bridge between theory and practice, generating a significant disconnection between academic training and professional reality (Morales-Holguín and González-Bello, 2020). Despite attempts to integrate creative approaches, most traditional methodologies followed a direct line, with emphasis on the transmission of technical knowledge and the reproduction of established models.

The shift towards a more flexible and integrative methodological vision began to take shape with the emergence of design thinking and divergent thinking. These approaches have allowed the exploration of new ways of approaching architectural problems, prioritizing empathy towards the user, interdisciplinary collaboration and experimentation (Brown, 2008, 2019; Casakin and Wodehouse, 2021; Guamán et al., 2022; Guamán-Quintanilla et al., 2023). The adoption of these methodologies has proven to be key to address current challenges, such as climate change, massive urbanization, and the need to design inclusive and sustainable spaces (Rodriguez and Fiscarelli, 2023; Rodriguez et al., 2022).

The purpose of this article is to analyze the transition from classical methodologies to a new methodological vision, focusing on its justification and relevance. Through a review of recent literature, the factors driving this change are examined, highlighting the importance of integrating design thinking, creativity, and interdisciplinary collaboration into architectural design education and practice. The review also addresses how these new approaches can bridge the gap between architectural production and end-user expectations.

This article is a partial synthesis of the broader analysis developed within the framework of the doctoral thesis entitled *"Propuesta metodológica para el diseño arquitectónico con enfoque sistémico aplicable a los procesos proyectuales del arquitecto. ARCHITECTURAL DESIGN THINKING SYSTEM: Architectural Design Thinking System."* The findings presented here summarize the most relevant aspects related to the need to adopt new methodologies in teaching and professional practice.

Literature Review
The evolution of classical methodologies in architectural design

Classical methodologies in architectural design were historically based on sequential learning and direct transmission of knowledge by the teacher. This approach was consolidated in the first decades of the twentieth century with the emergence of movements such as Art Nouveau and Art Deco, where design was oriented towards

aesthetics and ornamentation (Guarín, 2018). However, the Modern Movement marked a turning point by introducing functionalist principles and the use of industrial materials, which transformed both education and professional practice (Salama and Burton, 2022).

Throughout the 1960s and 1970s, alternative approaches such as Brutalism and Deconstructivism emerged, which introduced new forms and materials. However, the predominant teaching method continued to be that of the classroom-workshop, with a hierarchical and rigid structure that limited creative exploration (Morales-Holguín and González-Bello, 2020). This model was challenged in the 1980s and 1990s, when some scholars began proposing more dynamic and participatory approaches, incorporating teacher-learner learning models and alternative didactic sequences (Ozturk, 2020).

Despite these advances, the teaching of architectural design largely maintained its technical focus, resulting in an education centered on the reproduction of models and a scarce critical and creative capacity among students (López Álvarez, 2022; López Terrazas, 2021). This technical approach, although useful in stable industrial contexts, has been insufficient to respond to contemporary challenges, such as sustainability, digitalization, and the need for customization in architectural projects (Rodríguez Sandoval et al., 2022).

Limitations of Classical Methodologies

Traditional methodologies have been criticized for their linear approach and their reliance on direct transmission of knowledge. Authors such as Casakin and Wodehouse (2021) argue that this approach has generated a crisis of creativity in architecture, characterized by the replication of existing structures and the lack of time for experimentation. In addition, the disconnect between theory and practice has limited the ability of architects to develop innovative and adaptive solutions.

The impact of these limitations is especially evident in professional practice, where designs are often generic and repetitive, without adequately addressing the specific needs of end users (Park and Lee, 2022). Recent studies have highlighted how this gap affects the quality of the built environment, resulting in spaces that do not foster sustainability or the well-being of their inhabitants (Dash, 2021).

The COVID-19 pandemic also highlighted the shortcomings of classical methodologies by forcing many institutions to rapidly adopt remote teaching models and hybrid methodologies (Salama and Burton, 2022). This sudden transition highlighted the need for more flexible and adaptive methods to integrate emerging technologies and collaborative approaches to architect education.

Towards a New Methodological Vision: Design Thinking and Creativity

Design thinking has emerged as a direct response to the limitations of classical methodologies. This approach, popularized by authors such as Brown (2008) is based on problem solving with a focus on the end user, through empathy, experimentation and iteration. Unlike traditional linear approaches, design thinking encourages exploration of multiple possible solutions and continuous adaptation based on feedback (Pandey, 2021).

One of the key elements of this new vision is divergent thinking, which promotes the generation of innovative ideas and the evaluation of alternatives before converging on a final solution (Casakin and Wodehouse, 2021; Wodehouse and Casakin, 2022). This approach has proven to be effective in complex contexts, such as the design of sustainable and adaptive spaces, where it is necessary to consider multiple variables and future scenarios (Flores, 2020).

Interdisciplinary collaboration also plays a central role in this new methodological vision. The integration of architects, engineers, sociologists, and other professionals

allows architectural problems to be approached from diverse perspectives, enriching the design process and ensuring that the results are functional, sustainable, and socially responsible (Pilat and Person, 2022).

Benefits of the New Methodological Vision

The transition to methodologies based on design thinking offers multiple benefits. In the educational sphere, it fosters creativity and innovation among students, preparing future architects to face real and complex challenges (Rodriguez and Fiscarelli, 2023; Rodriguez et al., 2022). In professional practice, this new vision allows the development of more customized and sustainable architectural solutions, responding better to the expectations of users and to the context in which the projects are inserted (Park and Lee, 2022; Park, 2020).

In addition, the adoption of emerging technologies, such as 3D modeling and digital simulations, facilitates prototyping and early evaluation of designs, reducing the risk of errors and optimizing outcomes (Pilat and Person, 2022). These advances have been instrumental in overcoming the limitations of classical methodologies and establishing a new methodological basis for contemporary architectural design.

Method

Study Design

The present study adopts a qualitative systematic review approach, based on the PRISMA (*Preferred Reporting Items for Systematic Reviews and Meta-Analyses*) guidelines updated in 2020 by Page et al., (Page et al., 2021). This approach is ideal for the comprehensive analysis of recent methodological contributions in architectural design teaching, research and practice. The method used is characterized by the collection, filtering and critical analysis of relevant studies, ensuring a rigorous and well-founded evaluation of the methodological transition in the field. In addition, the transparency and reproducibility of the selection and analysis process of the reviewed studies is guaranteed.

The systematic literature review presented in this article follows the guidelines and criteria applied in the development of the aforementioned doctoral thesis, where a broader and more detailed analysis of the methodological aspects of architectural design is carried out.

Systematic Review Design

The systematic review process was structured in four main phases:
1. Identification of relevant studies -Prisma-.
2. Selection and filtering of studies according to predefined criteria -Prisma-.
3. Detailed content evaluation -Prisma-.
4. Analysis of patterns, co-occurrences and methodological trends -Atlas.ti-.

To ensure the transparency and reproducibility of the process, a PRISMA flow chart was developed, similar to the one used in the original article, detailing the stages of study selection from the initial search to the final inclusion in the review. The design of this study not only made it possible to identify the most significant contributions in the methodological transition of architectural design, but also facilitated the comparison of approaches and the detection of areas where challenges remain.

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Sources and Selection of Articles

The search for articles was carried out in recognized academic databases, such as Scopus, Web of Science and Google Scholar, guaranteeing access to high quality publications. Combinations of keywords in English and Spanish were used, such as "methodologies", "design thinking", "creativity in architecture", "innovation in architectural education" and "design education". The search was extended to books, peer-reviewed and open access articles.

The initial search process resulted in the identification of 365 potential studies. After applying inclusion and exclusion filters and reviewing titles and abstracts, 170 studies were selected for further analysis. Finally, the corpus was reduced to 120 articles, which form the basis of the qualitative analysis presented in this article. This procedure ensures a broad coverage of the different methodological perspectives in the recent literature.

The diagram of the identification of studies from the PRISMA method (

Figure *1*) shows the stages of the article selection process, from initial identification to final inclusion in the review.

Figure 1
Identification of studies based on the PRISMA method
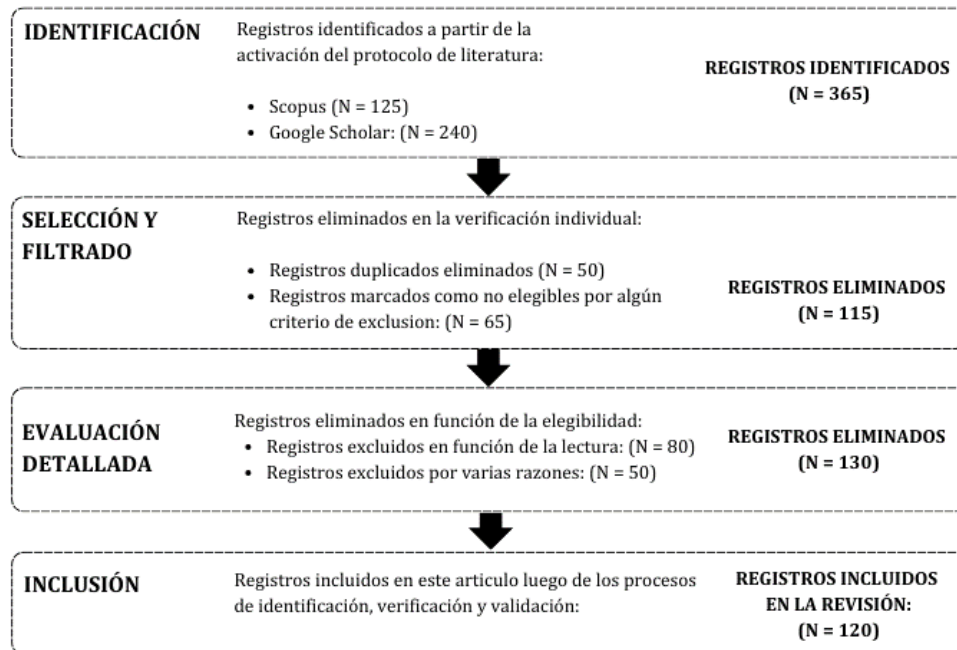
Inclusion and Exclusion Criteria

To select the studies included in the review, specific criteria were established to ensure the relevance and quality of the corpus analyzed:

Inclusion criteria
- Articles published between 2018 and 2024 in high impact indexed journals in architecture, design and education.
- Studies focused on the teaching of architectural design, applied methodologies and pedagogical innovation.
- Papers that include empirical data, theoretical analysis or case studies relevant to the methodological transition.
- Studies that address the evolution of teaching, research or practice methodologies in architectural design.

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- Empirical research or systematic reviews that provided significant data on the adoption of new methodologies, such as design thinking or interdisciplinary collaboration.
- Publications in Spanish and English, with access to the full text, i.e., open access.

Exclusion criteria
- Publications without peer review.
- Articles focused exclusively on technical aspects of construction, with no direct relation to the design methodology.
- Theoretical studies without empirical application.
- Publications focused on non-architectural disciplines.
- Work with lack of specific data or limited analysis.
- Studies that do not provide empirical evidence or critical analysis of architectural design methodologies.

This selection process made it possible to reduce the 365 articles initially identified to a final sample of 120 studies, which were analyzed in detail, and the results obtained represent an updated and significant panorama of the methodological evolution in the field of architectural design.

Data Organization

The selected studies were organized in a bibliographic analysis matrix, which contained essential information on the objectives, methods, results and conclusions of each study. This matrix facilitated the identification of patterns and recurring themes, as well as the comparison between different methodological approaches.

Qualitative Data Analysis

The selected articles were analyzed by thematic coding in Atlas.ti v24 software. This process allowed the identification of patterns, co-occurrences and trends related to the evolution of methodologies and their applicability in architectural practice, also allowed the categorization and coding of information through advanced content analysis techniques, facilitating the identification of patterns, trends and relationships between different methodological approaches (Niedbalski and Ślęzak, 2017).

Three main categories of analysis were initially defined, aligned with the objective of the study:
- Scope of application: Studies were analyzed according to their focus on teaching, research or professional practice.
- Methodological aspect: Key elements such as design thinking, divergent thinking and interdisciplinary integration were codified.
- Expected results: The benefits associated with the adoption of modern methodologies were identified, such as the promotion of creativity, innovation and improvement in the quality of architectural designs.

Each category was subdivided into specific codes by means of co-occurrence analysis, which made it possible to visualize the relationships between different concepts and methodological approaches. This coding process was iterative and was refined in several stages to ensure accuracy and depth of analysis (Casakin and Wodehouse, 2021).

Data Visualization and Synthesis of Results

The results of the qualitative analysis were synthesized using flow charts and Sankey plots, which illustrate the connections between categories and the magnitude of

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these relationships. These diagrams allow a clear representation of how the new methodologies contribute to overcome the limitations of classical approaches.

Rigor and Validity of the Study

To ensure the validity of the results, several quality control strategies were adopted, including:

- Internal peer review during the coding and analysis process in Atlas.ti.
- Cross-comparison of the results obtained in different phases of the analysis.
- Preparation of partial reports to verify the coherence and consistency of the findings.

In addition, a triangulation of data obtained from different sources (articles, reviews and reference documents) was performed to strengthen the robustness of the conclusions.

Limitations of the Method

While this study provides a comprehensive overview of the evolution of methodologies in architectural design, it is important to recognize certain limitations. First, the focus on studies published between 2018 and 2024 may exclude relevant contributions from previous decades. In addition, reliance on specific databases could limit the geographic diversity of the studies reviewed. Finally, although advanced qualitative analysis techniques were employed, the interpretative nature of the process could introduce some bias. To address these limitations, future studies are recommended that include historical and comparative reviews, as well as the incorporation of quantitative methods to complement the qualitative analysis presented in this article.

Results and Discussion

As previously mentioned: this article is a partial synthesis of a more in-depth analysis conducted as part of the doctoral research. This research resulted in a systematic literature review article and connection analysis using the method presented. Given the limited scope of this article, certain aspects related to the description of the results will be limited to 3 aspects: teaching, research and professional practice. The empirical analysis is further developed in the framework of a literature review article and the theoretical framework of the doctoral dissertation, where a more detailed evaluation of the results is provided. The following is the Figure 2 the connections between the aspects: design thinking, divergent thinking; and the areas of teaching, research and professional practice are shown.

Figure 2
Sankey diagram: connection between aspects and domains
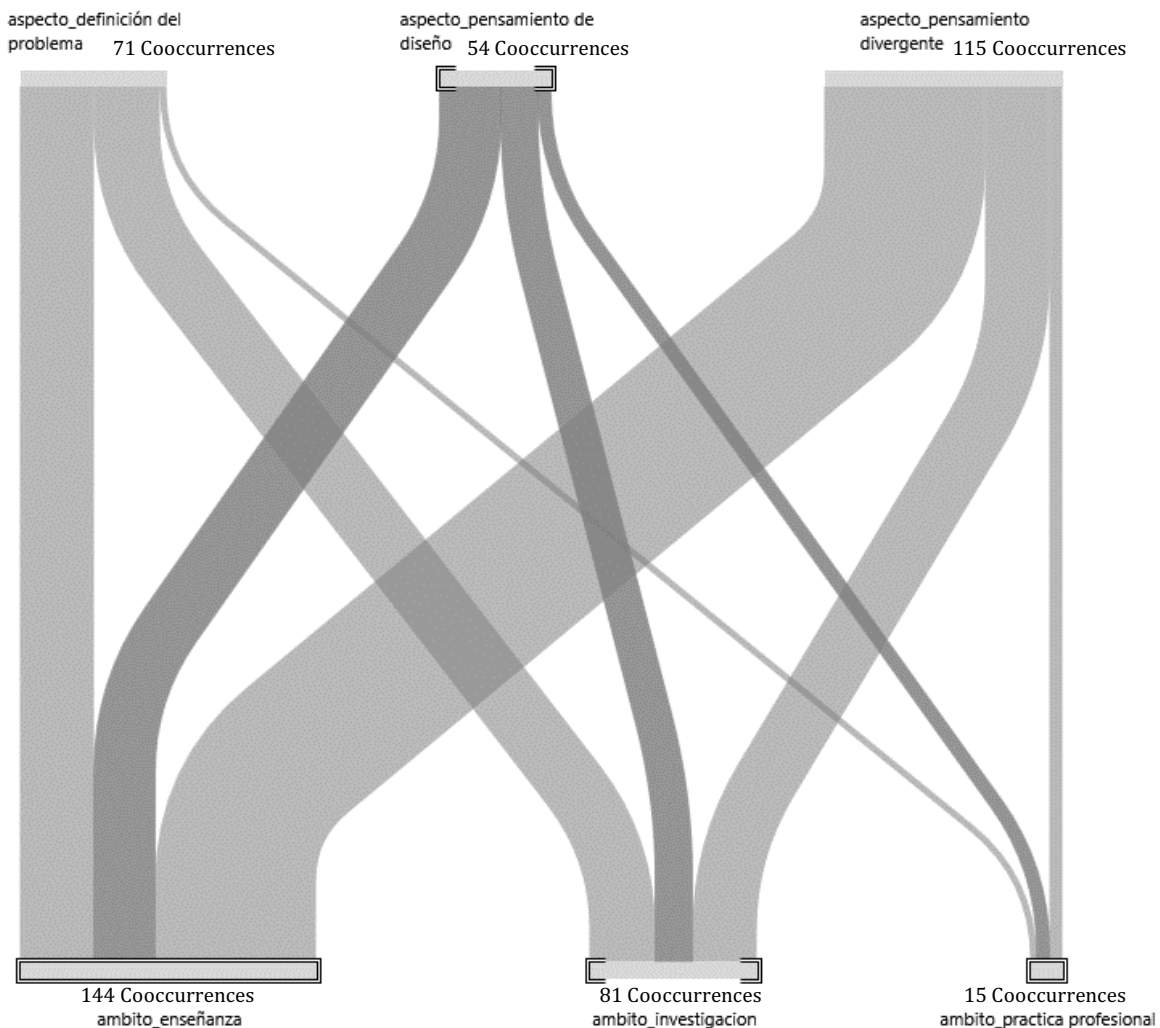
The results of the analysis indicate how aspects of divergent thinking and design thinking are interrelated with different domains of the formative and professional process in architectural design. The connections visualized by the thickness of the lines indicate the strength and frequency of cooccurrence between the codes analyzed. Three key areas are highlighted:

Teaching: In the field of teaching, divergent thinking plays a key role in the generation of creative ideas among students (Casakin and Wodehouse, 2021; Dash, 2021; Guarín, 2018; among others). According to the diagram, there is a strong connection between this aspect and the expected results related to creativity and exploration of alternatives. This indicates that academic programs that integrate divergent thinking allow students to develop innovative and unconventional solutions during the learning process. The visual link reflects how educational institutions have begun to implement pedagogical approaches centered on design thinking, promoting project-based learning and interdisciplinary collaboration (Brown, 2008; Danchenko, 2021; Guamán et al., 2022; Pandey, 2021; among others). This has fostered the development of critical thinking and creativity (López Terrazas, 2021; Rodríguez et al., 2022; Salama and Burton, 2022; among others).

Research: In the field of research, the diagram shows an intermediate connection between divergent thinking and applied research processes. This relationship suggests

that divergent thinking is used as an essential methodology in the generation of new hypotheses and experimental solutions. Design research, especially when it involves empirical studies and scenario modeling, benefits from the divergent approach by allowing the simultaneous exploration of multiple paths before converging on specific solutions (Casakin and Wodehouse, 2021; Flores, 2020; Hernandez-Moreno, 2020; among others).

Professional practice: Divergent thinking has no meaningful connection to professional practice. This is something that some authors make clear needs to be rethought. Divergent thinking allows architects and designers to explore creative alternatives and innovative solutions, overcoming the rigidity of traditional methodologies. The interdisciplinary collaboration, mentioned in the original article, further enhances this process, as different disciplines bring complementary perspectives that enrich the project development Hettithanthri et al., 2023; Mclaughlan and Chatterjee, 2020; Ozturk, 2020; Park and Lee, 2022; Park, 2020; Zeynep Aydemir and Jacoby, 2022; among others).

The results presented in this article -synthesis- show that a significant methodological transformation in architectural design, characterized by the transition from traditional approaches, would lead to a new vision based on creativity, interdisciplinarity and innovation. This evolution would be driven by several factors, including technological advances, the need to respond to the challenges of the contemporary environment and the search for a greater connection between architectural production and the expectations of end users. The following are the criteria presented by various authors in three areas: teaching, research and professional practice, which are interconnected and determine the effectiveness of this transition.

Transformations in the Educational Field: Towards an Education Focused on Design Thinking and Creativity

In the area of teaching, the results highlight the importance of abandoning traditional models of linear knowledge transmission and adopting pedagogical approaches that promote critical thinking, creativity and interdisciplinary collaboration. The teaching of architectural design has moved from being based on the repetition of established models to integrating design thinking as a central methodology. This transformation has been driven by the need to train architects capable of developing innovative and sustainable solutions (Rodríguez Sandoval et al., 2022).

Qualitative analysis shows that educational institutions that have incorporated design thinking into their curricula have been able to significantly improve students' ability to generate original ideas and solve complex problems (Salama and Burton, 2022). This approach allows them to explore multiple alternatives before converging on a final solution, promoting experiential and collaborative learning. In addition, divergent thinking, as an integral part of this methodology, fosters creativity by encouraging the generation of disruptive and unconventional ideas (Casakin and Wodehouse, 2021).

The findings also indicate that the adoption of emerging technologies, such as 3D modeling, augmented reality and digital simulations, has been key to enriching teaching and learning processes. These tools allow students to visualize and evaluate their proposals in real time, bridging the gap between theory and practice (Pilat and Person, 2022). In this context, universities have begun to adopt project-based learning models, where students collaborate in the resolution of real problems, which contributes to a comprehensive training oriented to the professional world (Rodriguez and Fiscarelli, 2023).

However, despite this progress, the results indicate that important challenges remain, such as the need to train teachers in new methodologies and ensure greater integration between academia and the professional sector. Some studies suggest that a lack of teacher training in design thinking may limit its effectiveness, as not all educators are prepared to guide students in creative exploration and complex problem solving (Salama and Burton, 2022).

Advances in Applied Research: from Theory to Interdisciplinary Practice

The field of research has undergone a significant transformation from traditional theoretical approaches to applied methodologies that combine empirical research with interdisciplinary analysis. The results of the review highlight how architectural design research has adopted holistic approaches that integrate quantitative and qualitative data, allowing for a deeper understanding of design processes and the needs of end users (Linares-Bermúdez, 2021).

In this sense, the analysis of co-occurrences performed using Atlas.ti software evidences the growing importance of interdisciplinary collaboration in architectural research. The studies reviewed indicate that research teams involving architects, engineers, sociologists and sustainability experts are able to develop more effective and adaptive solutions. This interdisciplinary orientation not only allows problems to be approached from multiple perspectives, but also facilitates the transfer of knowledge between academia and professional practice.

Despite these advances, some studies warn of the need to strengthen the links between academic research and professional practice. Although innovative methodologies have been developed, their implementation in the professional field is still limited, which hinders the full adoption of these new perspectives (Linares-Bermúdez, 2021; López Álvarez, 2022; Martínez, 2021; Martínez, 2013; Martínez Zarate, 2013; Rodríguez, 2023; Salama, 2022; Šķerstiņš and Ulme, 2020; among others). This challenge suggests the need to promote joint research projects between universities and architectural firms, as well as the creation of knowledge exchange platforms.

Professional Practice: Limited but Growing Integration of New Methodologies

At the professional practice level, the results indicate that, although traditional approaches persist, there is evidence of an increase in the adoption of methodologies based on design thinking and interdisciplinary collaboration. This change has been driven by the need to develop architectural solutions that respond to contemporary challenges, such as sustainability, energy efficiency, and social inclusion (Rodríguez Sandoval et al., 2022).

Analysis of the literature suggests that architectural firms that have incorporated these new methodologies have managed to improve the quality of their projects by designing more functional and personalized spaces that consider both the needs of the users and the conditions of the environment (Park, 2020). Incorporating design thinking allows architects to approach problems iteratively, exploring and evaluating multiple solutions before selecting the most appropriate one (Brown, 2008, 2019).

However, the results also reveal significant barriers to the widespread adoption of these methodologies in professional practice. These include resistance to change on the part of some practitioners, lack of specific training in design thinking, and poor integration of emerging technologies in some contexts (Casakin and Wodehouse, 2021). These limitations underscore the need to foster a culture of innovation within the sector and to promote continuous training programs for practicing professionals.

Finally, the importance of collaboration with other stakeholders, such as engineers, industrial designers, and environmental specialists, is highlighted to enrich the design process and ensure that architectural projects are sustainable and socially responsible (Pilat and Person, 2022). This collaborative approach not only contributes to innovation, but also allows for the development of integrated solutions that consider all aspects of design, from initial conception to execution.

Synthesis of Results: Cooccurrences and Methodological Trends

The co-occurrence analysis performed using Sankey diagrams shows how methodological aspects such as design thinking, information search and evaluation of alternatives are interconnected and determine the expected results in architectural projects. A strong correlation is observed between divergent thinking and creativity, suggesting that fostering this skill is key to generating innovative solutions (Casakin and Wodehouse, 2021). Likewise, critical thinking and complex problem solving emerge as essential components for improving the efficiency and effectiveness of designs (Salama and Burton, 2022).

The results show that the adoption of a new methodological vision based on design thinking, interdisciplinarity and innovation is essential to close the gap between theory and practice. This transition not only improves the training of future architects, but also makes it possible to develop projects that adequately respond to the demands of the contemporary environment.

Conclusions

The evolution of methodologies in architectural design is a necessary and urgent process in the context of contemporary challenges, such as sustainability, digitalization and adaptation to the dynamic needs of users. The results obtained from this systematic review confirm that classical methodologies, although fundamental at the time, have shown significant limitations, especially in their capacity to generate innovative and adaptive designs. In contrast, design thinking and interdisciplinary collaboration have emerged as promising approaches to transform both the teaching and professional practice of architectural design.

The findings of this systematic review highlight the pressing need for a methodological transformation in architectural design, moving away from traditional rigid and sequential approaches towards a more dynamic and integrative model, focusing on design thinking, divergent thinking and interdisciplinary collaboration. This transition is not simply a change in teaching or design techniques, but an evolution that seeks to ensure that architectural projects respond to the complex and changing demands of the contemporary environment.

In academia, it has been shown that the abandonment of classical methodologies in favor of approaches based on creativity and exploration has improved students' ability to generate innovative solutions and solve complex problems (Casakin and Wodehouse, 2021; Salama and Burton, 2022). Institutions that have adopted project-based learning models and integrated divergent thinking have had promising results, with graduates better prepared to face real-world challenges. However, to achieve a sustained impact, it is necessary to train teachers in the use of these methodologies and to strengthen the links between academia and the professional sector.

In terms of professional practice, although significant steps have been taken towards the adoption of flexible and collaborative methodologies, there are still barriers

that limit their widespread implementation. Resistance to change, lack of access to advanced technologies and limited specific training in design thinking remain major challenges. Overcoming these limitations will require a joint effort by academic institutions, architectural firms and professional bodies.

One of the key findings of this study is the need to close the gap between theory and practice, which has limited the effective implementation of new methodologies in the professional setting. To achieve this, it is essential to strengthen the links between academia and the professional sector through the creation of joint projects, knowledge-sharing platforms and continuing education programs. These actions will allow a more effective transfer of methodological advances, ensuring that architects in training and in practice have the necessary tools to face the challenges of the built environment.

The incorporation of divergent thinking and creativity in teaching programs has proven to be a determining factor in the generation of innovative solutions. Educational institutions should adopt project-based learning models, where students can work on solving real problems in collaboration with other professionals and social actors. This approach not only fosters innovation, but also prepares future architects to respond effectively to the specific requirements of each project.

Bridging the gap between theory and practice is critical to ensure the successful adoption of these new methodologies. This challenge requires the creation of platforms for knowledge exchange and joint research projects between academia and industry, where the impact of new methodologies on the quality of architectural design is constantly evaluated.

Recommendations

Based on the results and conclusions of this review, the following recommendations are proposed to foster a successful transition to the new methodological vision in architectural design:

- Integrate emerging methodologies into the academic curriculum: Educational institutions should actively incorporate methodologies such as design thinking, divergent thinking and interdisciplinary approaches into their curricula. This implies comprehensively reforming the curriculum to develop critical and creative competencies in students, thus strengthening their capacity to solve real, complex and contemporary problems.
- Integrate design thinking and divergent thinking into academic curricula: Educational institutions should include these approaches in their curricula, promoting creativity and the ability to solve complex problems.
- Promote applied research: It is necessary to develop research projects that directly link theory with practice, allowing the new methodologies to be validated and perfected in real environments, as well as to develop joint research projects between universities and architectural firms to evaluate the effectiveness of the new methodologies.
- Continuous training in emerging technologies and soft skills: Establish continuing education programs to enable professionals to update their knowledge and skills, especially in the use of emerging technologies. Teacher training is essential to ensure the effective implementation of design thinking and interdisciplinary collaboration in the educational process.
- Promote interdisciplinary collaboration between academia and professional practice: Establish working teams that include architects, engineers,

sociologists and other experts, in order to develop integrated solutions that consider all aspects of design.

Long-Term Impact on Society:

The implementation of innovative methodologies in architecture will have important benefits for society. First, it will make it possible to design more sustainable spaces adapted to specific needs, improving the quality of community life and addressing current challenges such as climate change and social inclusion. In addition, training architects with advanced skills in creativity, critical thinking and innovation will strengthen the capacity to respond to future challenges of the built environment. Finally, improving the connection between academia and the professional sector will foster a continuous culture of innovation, benefiting not only the architectural field but also the integral development of cities and communities.

Limitations of the Study

This study, although relevant, has certain limitations that should be considered in future research. The review has focused mainly on publications from the last five years, which may have excluded important contributions from earlier periods. In addition, the selection of articles was limited to English and Spanish sources, so some regional or local perspectives may not have been included.

Future Lines of Research

To continue exploring and strengthening the transition towards a new methodological vision in architectural design, the following lines of research are suggested:

- Empirical evaluation of new methodologies: Conduct case studies in which the new methodologies are implemented and evaluated in real projects, in order to measure their impact on design quality and user satisfaction.
- Impact of technology on creativity and innovation: Investigate how the use of emerging technologies, such as 3D modeling and digital simulations, can enhance creativity and innovation in the architectural design process.
- Exploration of regional and cultural approaches: Extend the review to specific regional contexts, in order to identify alternative methodological approaches that can enrich the global practice of architectural design.
- Integration of sustainability and social responsibility: Analyze how new methodologies can more effectively incorporate sustainability and social responsibility criteria, ensuring that architectural projects contribute to the well-being of communities and the environment.
- Empirical studies that systematically evaluate the effectiveness of new architectural methodologies, especially those focused on design thinking and the use of emerging technologies.
- Specific research on how technologies such as artificial intelligence and digital simulations influence creativity during the architectural design process.

References

Aydemir, A. Z., & Jacoby, S. (2024). Architectural design research in small practices. *International Journal of Architectural Research: Archnet-IJAR*, *18*(1), 191–205. https://doi.org/10.1108/ARCH-07-2022-0142/FULL/XML

Brown, T. (2008, junio). Design Thinking. *Harvard Business review*, 1–11. www.hbr.org

Brown, T. (2019). Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation (2009). *Markets, Globalization & Development Review*, *4*(2). https://doi.org/10.23860/mgdr-2019-04-02-08

Casakin, H., & Wodehouse, A. (2021). A Systematic Review of Design Creativity in the Architectural Design Studio A Systematic Review of Design Creativity in the Architectural Design. *Buildings*, *11*(31), 1–19. https://doi.org/10.3390/buildings11010031

Danchenko, L. (2021). Development of spatial-design thinking in architecture education. *E3S Web of Conferences*. https://doi.org/10.1051/e3sconf/202127409010

Dash, S. P. (2021). An exploratory study on design process in architecture: perspective of creativity. *Creativity Studies*, *14*(2), 346–361. https://doi.org/10.3846/CS.2021.12989

Flores, A. (2020). Del concepto formal a la conceptualización sistémica en el diseño arquitectónico. *Contexto: Revista de la Facultad de Arquitectura Universidad Autónoma de Nuevo León, 14*(20). 9. https://dialnet.unirioja.es/servlet/articulo?codigo=7433584&info=resumen&idioma=SPA

Guamán, S., Everaert, P., Chiluiza, K., & Valcke, M. (2022). Impact of design thinking in higher education: a multi-actor perspective on problem solving and creativity. *International Journal of Technology and Design Education*, *33*(1), 217–240. https://doi.org/10.1007/S10798-021-09724-Z/TABLES/7

Guaman-Quintanilla, S., Everaert, P., Chiluiza, K., & Valcke, M. (2023). Impact of design thinking in higher education: a multi-actor perspective on problem solving and creativity. *International Journal of Technology and Design Education*, *33*(1), 217–240. https://doi.org/10.1007/s10798-021-09724-z

Guarín, J. M. (2018). Metodologías de diseño arquitectónico: una reflexión histórica para la elaboración del proceso creativo. *Arkitekturax Visión FUA*, *1*(1), 37–47. https://doi.org/10.29097/26191709.200

Gutiérrez Talledo, L. J. (2018). Neuroarquitectura y creatividad en el aprendizaje del diseño arquitectónico. *PAIDEIA XXI*, *6*(7), 171–189. https://doi.org/https://doi.org/10.31381/paideia.v6i7.1607

Hemdan, J. T., Taha, D. S., & Cherif, I. A. (2023). Relationship between personality types and creativity: A study on novice architecture students. *Alexandria Engineering Journal*, *65*, 847–857. https://doi.org/10.1016/J.AEJ.2022.09.041

Hernández-Moreno, S. (2020). Teoría general de sistemas aplicada al diseño arquitectónico sustentable. *Legado de Arquitectura y Diseño*, *3*(4), 55–66. https://legadodearquitecturaydiseno.uaemex.mx/article/view/13756

Hettithanthri, U., Hansen, P., & Munasinghe, H. (2023). Exploring the architectural design process assisted in conventional design studio: a systematic literature review. *International Journal of Technology and Design Education*, *33*(5), 1835–1859. https://doi.org/10.1007/s10798-022-09792-9

Kokorina, E. V. (2022). Space of conceptual creativity based on architectural design. *Russian Journal of Building Construction and Architecture*, *53*(1). https://doi.org/10.36622/VSTU.2022.53.1.008

Linares-Bermúdez, M. A. (2021). Aporte de las competencias investigativas a la integración de saberes curriculares en el escenario de aprendizaje del Taller

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de Diseño Arquitectónico. *Revista de Arquitectura*, *23*(1), 66–73. https://doi.org/10.14718/revarq.2021.2170

López Álvarez, D. (2022). La investigación en educación arquitectónica: Qué es y quién debería liderarla. *JIDA: textos de arquitectura docencia e innovación 9*, 16–19. https://upcommons.upc.edu/handle/2117/380746

López Terrazas. (2021). Arquitectura y Filosofía: enseñanzas del diseño arquitectónico. *Locus. Territorio, ciudad, arquitectura y diseño,* 1(1), 11–18). https://www.iiach.fach.umss.edu.bo/revista-locus-ano-1-n-1/

Manuel, J., & Salinas, G. (2018). Metodologías de diseño arquitectónico: una reflexión histórica para la elaboración del proceso creativo architectural design Methodologies: an historical thought to develop creative process. *Arkitekturax Visión FUA*, *1*(1), 37–47. https://orcid.org/0000-0002-

Martínez, C. F. (2021). La investigación proyectual como estrategia didáctica en el proyecto del Taller de Diseño Arquitectónico. *Revista de Arquitectura*, *23*(2). https://doi.org/10.14718/RevArq.2021.3294

Martínez, P. A. (2013). El Proyecto Arquitectónico como un Problema de investigación. *Revista de Arquitectura*, *15*, 54–61. https://doi.org/http://dx.doi.org/10.14718/

Martínez Zarate, R. (2013). *Diseño Arquitectónico: Enfoque Metodológico*. Trillas.

Mclaughlan, R., & Chatterjee, I. (2020). What Works in the Architecture Studio? Five Strategies for Optimising Student Learning. *International Journal of Art and Design Education*, *39*(3), 550–564. https://doi.org/10.1111/jade.12303

Morales-Holguín, A., & González-Bello, E. O. (2020). Enseñanza y uso de métodos de diseño en México. Percepciones del profesorado. *Formacion Universitaria*, *13*(1), 35–42. https://doi.org/10.4067/S0718-50062020000100035

Navarro, M. (2020). La creatividad en la formación del arquitecto, el proceso creativo y las neurociencias. *Revista Iberoamericana para la investigación y el desarrollo educativo*, *10*(20), 1–28. https://doi.org/https://doi.org/10.23913/ride.v10i20.667

Niedbalski, J., & Ślęzak, I. (2017). Computer assisted qualitative data analysis software. Using the NVivo and Atlas.ti in the research projects based on the methodology of grounded theory. *Studies in Systems, Decision and Control*, *71*, 85–94. https://doi.org/10.1007/978-3-319-43271-7_8

Ozturk, S. (2020). Rethinking the Black Box in Architecture Design Studio. *SAGE Open*, *10*(2), 215824402092740. https://doi.org/10.1177/2158244020927408

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *PLOS Medicine*, *18*(3), e1003583. https://doi.org/10.1371/JOURNAL.PMED.1003583

Pandey, Ar. A. (2021). Architecture: The Transformation from Thinking to Design. *International Journal for Research in Applied Science and Engineering Technology*, *9*(8), 2579–2588. https://doi.org/10.22214/ijraset.2021.37832

Park, E. J., & Kim, M. J. (2021). Visual Communication for Students' Creative Thinking in the Design Studio: Translating Filmic Spaces into Spatial Design. *Buildings*, *11*(91). https://doi.org/10.3390/buildings11030091

Park, E. J., & Lee, S. (2022). Creative Thinking in the Architecture Design Studio: Bibliometric Analysis and Literature Review. *Buildings*, *12*(6), 828. https://doi.org/10.3390/buildings12060828

Park, S. (2020). Rethinking design studios as an integrative multi-layered collaboration environment. *Journal of Urban Design*, *25*(4), 523–550. https://doi.org/10.1080/13574809.2020.1734449

Pilat, & Person, A. (2022). Inclusive Design Studios: Rethinking the Instructor's Role. *Enquiry*, *19*(1), 62–75. https://doi.org/10.17831/ENQARCC.V19I1.1127

Rodríguez, Bernal, G. M., & Rodríguez, M. I. (2022). From preconceptions to concept: The basis of a didactic model designed to promote the development of critical thinking. *International Journal of Educational Research Open*, *3*, 100207. https://doi.org/10.1016/J.IJEDRO.2022.100207

Rodríguez, & Fiscarelli, D. (2023). El taller de arquitectura: divergencias ante las prácticas pedagógicas instituidas. *Materia Arquitectura*, *23*, 76–93. https://doi.org/10.56255/MA.V1I23.537

Rodríguez, L., Fiscarelli, D., & Fernández, J. (2022). La dimensión técnica en la enseñanza proyectual: entre la ciencia y el diseño. *Arquitecno*, *0*(19), 53–62. https://doi.org/10.30972/ARQ.0195969

Rodríguez, L. G. (2023). Acuerdos epistemológicos para el saber proyectual. *Area*, *29*(1), 1–9. https://publicacionescientificas.

Rodríguez Sandoval, M. T., Bernal Oviedo, G. M., & Rodríguez-Torres, M. I. (2022). From preconceptions to concept: The basis of a didactic model designed to promote the development of critical thinking. *International Journal of Educational Research Open*, *3*. https://doi.org/10.1016/j.ijedro.2022.100207

Salama, A. M. (2022). Knowledge spaces in architecture and urbanism – a preliminary five-year chronicle. *Archnet-IJAR*, *16*(1), 1–25. https://doi.org/10.1108/ARCH-12-2021-0360

Salama, A. M., & Burton, L. O. (2022). Defying a Legacy or an Evolving Process? An Evolutionary Account for a Post-Pandemic Design Pedagogy in Architecture and Urbanism. *Proceedings of the Institution of Civil Engineers: Urban Design and Planning*, *175*(1), 5–21. https://doi.org/10.1680/jurdp.21.00023

Salazar, C., Artega, I., Rodriguez, C. M., & Nadal, D. H. (2020). Active Learning in Architectural Education: A Participatory Design Experience (PDE) in Colombia. *International Journal of Art and Design Education*, *39*(2), 346–366. https://doi.org/10.1111/jade.12280

Salinas, N., & Tenesaca, J. (2018). Una alternativa de análisis de proyecto arquitectónico. *Revista Caribeña de Ciencias Sociales*, 1–14. www.eumed.net/rev/caribe/2018/04/proyecto-arquitectonico.html

Šķērstiņš, G., & Ulme, A. (2020). Main stages of development of architectural science. Organization, methodology and updating of theoretical knowledge in the field of architecture and design. *Landscape Architecture and Art*, *15*(15), 106–111. https://doi.org/10.22616/J.LANDARCHART.2019.15.12

Wodehouse, A., & Casakin, H. (2022). Design Creativity in Architecture and Engineering. *Buildings*, *12*(10). https://doi.org/10.3390/buildings12101552

Zeynep Aydemir, A., & Jacoby, S. (2022). Architectural design research: Drivers of practice. *The Design Journal*, *25*(4), 657–674. https://doi.org/10.1080/14606925.2022.2081303

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