REVIEW OF STUDIES WITH AN ORIENTATION TO PROJECT METHODOLOGIES FOR ARCHITECTURAL EDUCATION PRACTICES
REVISIÓN DE ESTUDIOS CON ORIENTACIÓN A LAS METODOLOGÍAS PROYECTUALES PARA LA ENSEÑANZA EN ARQUITECTURA

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	ABSTRACT
Keywords: architecture education, architecture, building design, higher education	Project development is one of the essential skills that is intended to be strengthened when training architects in the academic field. However, methods and processes to develop projects are either not established or vary in structure and sequence, responding to various themes and variables in the faculties of architecture. Due to this, in this article, different studies are reviewed with an orientation to design development methods for architecture teaching to find relevant data, find common aspects and define the most critical variables that guide these investigations. A literature review method is used by which investigations closely related to the subject are chosen by applying exclusion criteria. The information obtained is processed through descriptive statistical analysis, organizing and tabulating the data. Subsequently, the most relevant findings are reflected, analyzed, and described. The main results of this article show that the methods used in the investigations studied are primarily qualitative and focus on methodological, analytical, reflective, and pedagogical aspects. Additionally, the essential variables that influence and lead these investigations are: impact on the context and society, activities and tools, coherence in the process, and project specificity, which represent a guide for future analysis studies or project methodology proposals for architectural education practices.
	RESUMEN
Palabras clave: enseñanza de la arquitectura, arquitectura, diseño arquitectónico, enseñanza superior	El desarrollo de proyectos es una de las habilidades esenciales que se pretende fortalecer en el ámbito académico en la formación de arquitectos. Sin embargo, los métodos y procesos para elaborar proyectos o no están establecidos, o varían en estructura y secuencia respondiendo a diversas temáticas y variables en las facultades de arquitectura. Debido a esto, en este artículo se revisan diferentes

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estudios con orientación a métodos de desarrollo proyectual para la enseñanza en arquitectura para hallar datos relevantes, encontrar aspectos en común y definir las variables más críticas que conducen estas investigaciones. Se utiliza un método de revisión de la literatura mediante el cual se eligen investigaciones íntimamente relacionadas con la temática aplicando criterios de exclusión. La información obtenida es procesada mediante análisis estadísticos descriptivos, organizando y tabulando los datos. Posteriormente se reflexiona, analiza y describen los hallazgos más relevantes. Los principales resultados de este artículo, muestran que los métodos utilizados en las investigaciones estudiadas son mayoritariamente cualitativos y se enfocan en aspectos metodológicos, analíticos, reflexivos y pedagógicos. Adicionalmente, las variables esenciales que influyen y conducen estas investigaciones son: impacto en el contexto y la sociedad, actividades y herramientas, coherencia en el proceso y especificidad proyectual, por lo que estas representan una guía para futuros estudios de análisis o propuestas de metodología proyectual en arquitectura.

Introduction

The development of architectural projects needs to obey a structured sequence of stages and phases in order to obtain useful results. For this reason, it is imperative to review the studies oriented to the Project Development Methodologies (PMM) in order to identify relevant aspects considered in these processes and to organize the activities so that they are as consistent and coherent as possible. According to the *Project Management Institute* (PMI), it tells us that project management should have a life cycle and follow a logical sequence of steps such as: analyze the feasibility of the project, design, build, test, deploy and close the project. It also indicates that there are several standards related to behaviors, actions and approaches to project development, being the Predictive approach, one of those used for the management of architecture and construction projects.

> A project to develop a new community center could use a predictive approach to land and facility construction. The scope, schedule, cost and resources would be determined in advance, and changes would likely be minimal. The construction process would follow the plans and blueprints (PMI, 2021, p.36).

On the other hand, when we focus specifically from the point of view of the process for architectural design, Velázquez (2016, p. 861) tells us that:

> The project methodology never ceases to be nourished by new conceptualizations and theoretical positions in the face of the challenge of working on the transformation of the habitat. The making of architecture entails in itself the notion of a craft that, over time, gains in technique or more precisely in the design method. The project as a true object of permanent learning implies putting into action the practice of devices-tools to address the problems of the case.

This methodology must be in constant improvement and transformation in relation to the project conditions and involves the use of various activities, strategies and tools to provide an adequate solution to the design problem. This project method should be understood as a process of cognition that promotes the production of new concepts. The above, in order to contribute with new ways or paths to carry out the research and this process from the conceptual and procedural point of view (Burgos, 2016).

The PMI offers us several principles and guidelines to develop projects, of which we have: adapt according to the context, which is imperative to take into consideration for the field of architectural project design.

> Project success is based on adapting to the unique context of the project to determine the most appropriate methods to produce the desired results. Adapting the approach is iterative, and therefore is an ongoing process throughout the project (PMI, 2021, p. 44).

As in project management, architectural design must take into account contextual needs and perform cyclical iteration processes to find possible improvements to the project. The activities that are contained within this process have the ultimate goal of generating a project that is oriented to satisfy a need and that are structured in a defined and clear method, with this process having the same or even a higher level of importance than the final result itself.

However, the *Royal Institute of British Architects* (RIBA, 2020) points out that the process specifically for the design of architectural projects is not fully established or formally recorded in many countries and that, moreover, the manner in which it is designed often follows informal and haphazard sequences. The consequence of this is that the informality in the elaboration of projects is transmitted between generations of architects, without finding a point of convergence or agreement. According to Correal et al. (2015, p. 24):

> For many years of teaching architectural design in our schools, the vast majority of teachers have reproduced the forms adopted by professional practices for the solution of projects, so that each generation of architects does the same with minor variations in content and instrumentation, as a result of the historical and cultural moment in which they develop.

Therefore, the MDPs should be reviewed and studied, and university professional training in architecture should encourage the updating of these processes, so that the educational environment is not simply a repetition of what is customary in the profession, but rather a logical and coherent process, linked to the needs of the community (Ríos-Gutiérrez and Sánchez-Macías, 2022). The constant revision of the methods applied in academia, must start from research, which is one of the essential purposes of universities, so Quinte (2015, p. 37) states that:

> Research is an essential and mandatory function of the university, which promotes and carries it out, responding through the production of knowledge and development of technologies appropriate to the needs of society, with special emphasis on the national and international reality.

This production of knowledge through research must respond to methodologies that are constantly being updated so that they do not become outdated in time, nor are they the continuous reproduction of past schemes, as is often the case with MDP applied to architectural projects.

Higher Education Institutions (HEIs) have the responsibility to promote research in various forms, focusing on current problems and impacting local and national social development (Rodriguez, Cano, & Velez, 2018). For this reason, training professionals to meet both economic and sociocultural needs is a constant challenge (Garbizo et al., 2021). This challenge must be assumed by the faculties of architecture, which must clarify, update and identify the key variables and methodological processes oriented to research for the production of architectural projects.

However, as shown above, the lack of a clear methodological process to solve projects has the consequence that these deficiencies affect the academic training in architecture, which is exposed by commenting that:

> The teaching of the architectural discipline rests on a base that has remained in many aspects static, the scarce clarification has not allowed drawing clear distinctions that sustain the action of the teaching of the project on a common basis of shared conventions, beyond the planimetric and spatial language, projective means of representation par excellence (Medina et al., 2017, p. 18).

This lack of clarity and specificity in the methods of development of architectural projects, originate divergences and discrepancies within the same educational process. As a consequence of the above, the projects generated lack support and weight, which is why there is an imperative need to review the studies oriented to current project methodologies, propose new and cutting-edge models (Martínez et al., 2020), study and

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analysis tools (Figueroa and Guaraz, 2021) and identify the most important variables that influence the development of projects to be applied in the educational field of architecture.

Method

This article uses a methodology based on the Petticrew and Roberts (2008) literature review guide for the social sciences to review the research found.

A search of research was made in Google Scholar, Scielo, Scopus and Redalyc databases with orientation to the study of project methodologies in architecture from 2013 to 2022, from which 167 results were obtained. Subsequently, only qualitative or mixed research that described, reflected on or analyzed academic methods for the development of architectural projects was chosen. It is worth mentioning that only studies in Spanish were chosen and duplicate articles were eliminated. Consequently, 35 studies were analyzed in this article.

The data were processed using descriptive statistical analysis by means of frequency tables and summary graphs to classify the investigations by means of percentages and quantities. The review of the studies analyzed here were organized and tabulated in Excel using the following data: Number of studies per year, Type of publications, Countries of publication, Methodology applied, Focus of the study, Recurrent topics and Relevant variables. Subsequently, descriptions are made of the findings and essential elements found in response to the research questions.

Results

Study criteria and questions

The research selected and studied in this article was subjected to seven questions that respond to the following criteria: number per year, type of publication, country, methodology, approach, topics and variables (see Table 1). The answer to these questions allows us to obtain relevant data for the knowledge of the state in question and to deepen the study of each of these investigations.

Table 1
Study questions

No.	Criteria	Questions
C1	Production of studies per year	What is the production of published studies oriented to project development methods for architectural education per year?
C2	Type of publications	What types of studies are published with a focus on design development methods for architectural education?
C3	Countries of publication	Which countries publish studies oriented to design development methods for architectural education?
C4	Methodology applied	What type of methodology is applied in studios oriented to project development methods for teaching architecture?
C5	Focus of the study	What is the approach used in studies oriented to project development methods for teaching architecture?
C6	Recurring themes	What are the most recurrent themes found in studies oriented to project development methods for teaching architecture?
C7	Relevant variables	What are the most relevant variables that drive studies oriented to project development methods for teaching in architecture?

Production of studies per year

As shown in Figure 1 and based on criterion C1 (Number of studies per year), the research reviewed here is between 2013 and 2022. It is observed that there was a sustained increase in the number of studies on project development methods for teaching in architecture since 2017 (8%), with 2018 being the year of highest production, constituting 23% of the total number of publications. This number of studies remained high in 2019 (17%) and 2020 (17%).
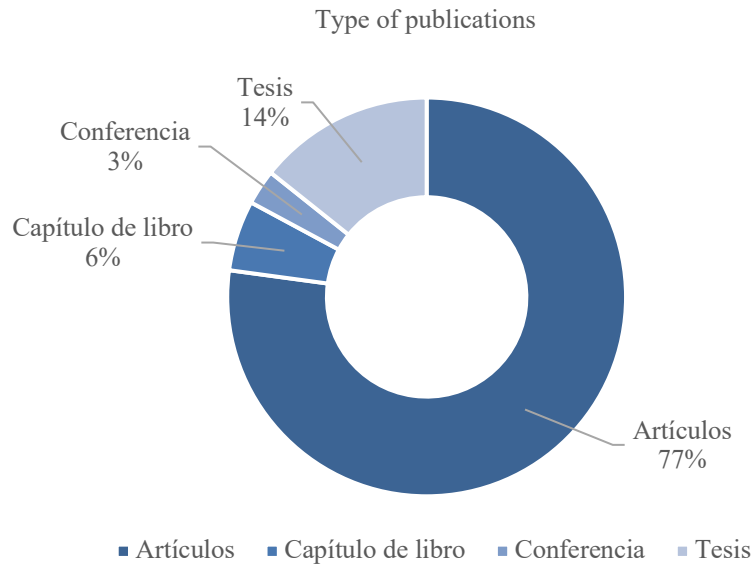
Figure 1
Production of studies per year

Production of studies per year
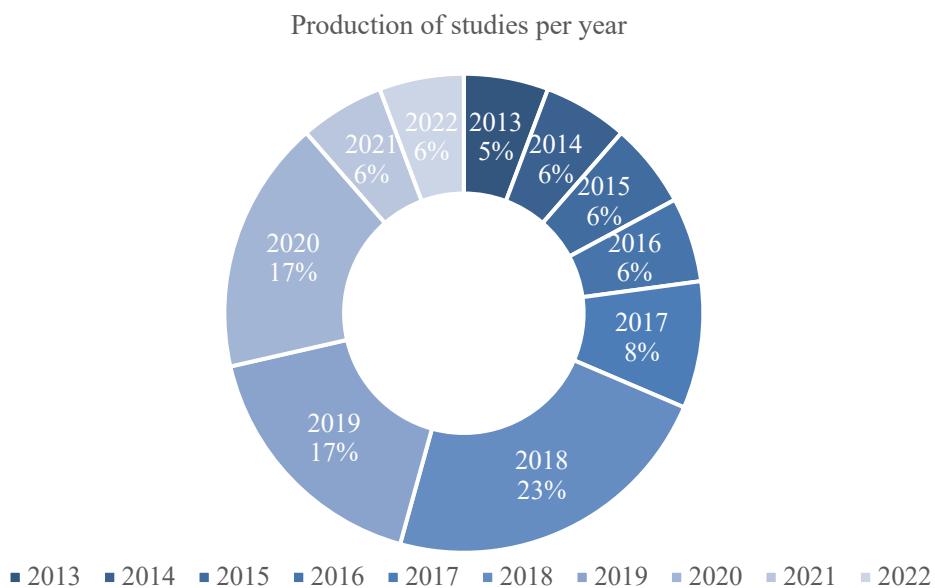
Type of publications

With respect to criterion C2 Type of publications (see Figure 2), four were identified: articles, theses, book chapters and conferences. The vast majority represent articles with 77%. On the other hand, theses on this subject account for 14%. It is worth mentioning that some of the articles reviewed are part of postgraduate studies, so several of them are part of graduate thesis works. Book chapters make up 6%, while conferences represent the lowest percentage with only 3%.
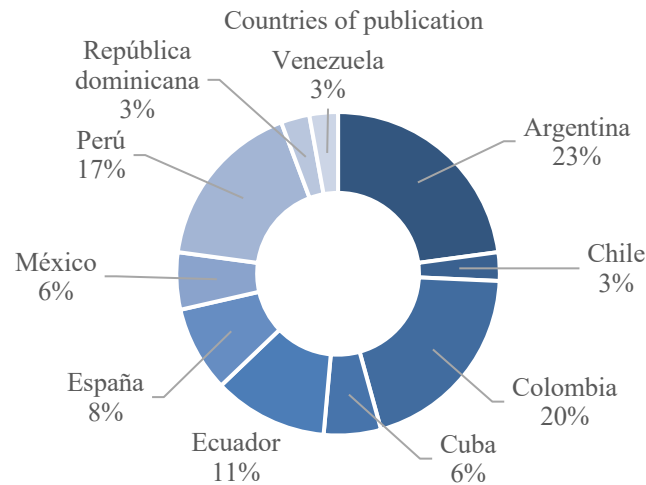
Figure 2

Type of publications

Type of publications

Tesis
14%

Conferencia
3%

Capítulo de libro
6%

Artículos
77%

■ Artículos   ■ Capítulo de libro   ■ Conferencia   ■ Tesis

Countries of publication

Considering criterion C3 (Countries of publication), the following results were obtained: most of the production is in South America with 77%, with Argentina in first place with 23%, followed by Colombia with 20% and then Peru (17%) in third place. Ecuador (11%) ranks fourth and Spain (8%) fifth. Cuba and Mexico follow with 6% in both cases, followed by Chile, the Dominican Republic and Venezuela, which together account for 9% (see Figure 3).

Figure 3
Countries of publication

Methodology applied

As shown in Figure 4, in criterion C4 (Methodology applied), it was found that 71% of the research analyzed belonged to a qualitative type of research. This is due to the description and characterization of concepts and methods focused on pedagogical methods for the generation of architectural projects. On the other hand, research that mixes qualitative and quantitative methods represents 29%, containing numerical and statistical data as well as descriptions.

Figure 4
Methodology applied
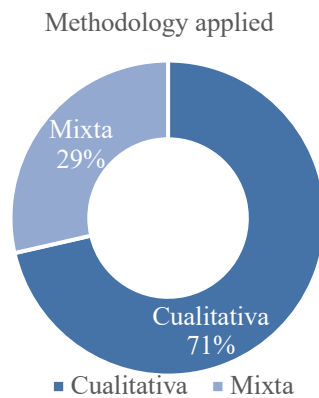
Focus of the study

Criterion C5 (Study approach) was evaluated and it was found that 46% of the research belonged to the Methodological approach. They propose methods for the development of architectural projects in academic environments, mentioning the structure and the steps that must be followed in order to practice them successfully. On the other hand, 17% belong to the Reflective approach, in which they focus on meditation and questioning the current methods of pedagogy in architecture and the current state of the art in project development. In the case of the analytical approach, they represent 20% and focus on critical analysis of existing methodologies and their impact on current

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educational practices. Finally, the Pedagogical approach (17%), in which efforts are evoked to propose new teaching methods for the development of architectural projects from a didactic point of view (see figure 5).

Figure 5
Focus of the study

Focus of the study
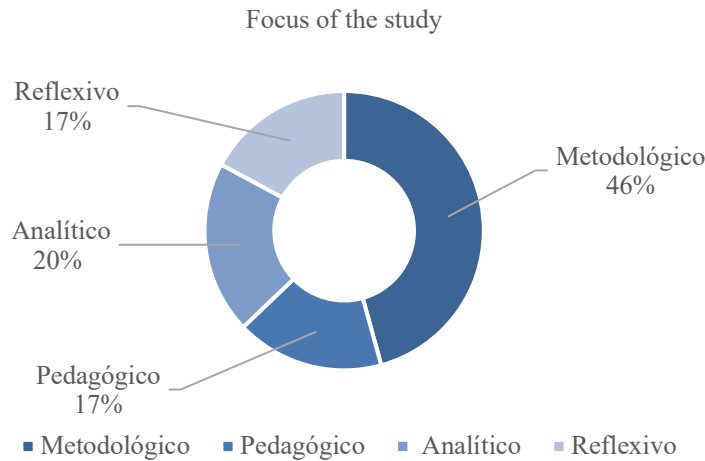
Recurring themes

To respond to criterion C6 (Recurrent Themes), the studies reviewed are organized on the basis of the approaches established in the previous criterion, with 16 studies having a Methodological approach, 7 having an Analytical approach, 6 having a Reflective approach and 6 having a Pedagogical approach, as shown in Table 2.

Table 2
Authors by focus

Approach	Authors
Methodological	Bejarano (2017), Bocanegra-Herran (2019), Burgos (2016), Burgos (2017), Cardet (2019), Casares and Raya de Blas (2019), Heinzmann et al. (2015), Martínez (2021), Martínez (2013), Millán-Millán (2020), Mundo (2020), Pedreño (2018), Putallaz et al. (2018), Ríos-Gutiérrez and Sánchez-Macías (2022), Rodríguez, Giordano and Domínguez, (2018), Velázquez (2016)
Analytical	Muntañola and Saura (2013), Correal et al. (2015), Fisch et al. (2014), Alvarado (2019), Figueroa and Guaraz (2021), Tami-Cortes and Coronel-Ruiz (2018), Montoro (2018)
Reflective	Medina et al. (2017), Fernandez et al. (2018), Hidalgo (2020), Castro-Mero (2020), Martínez and Valdés (2020), Bermeo and Echeverría (2022)
Pedagogical	Torres and Padrón (2014), Perlaza and Betancourt (2018), Sandoval (2018), Valdivia (2019), Arteaga (2019), Martínez et al. (2020)

The research studies were analyzed by approach to find possible similarities in the topics addressed and their frequency, so we began with a summary of each of the studies.

In the case of studies with a Methodological approach, it is worth mentioning that Bejarano (2017) proposes a methodology that contains three dimensions: environmental, social and economic, also indicating that the stages of awareness (for the community and the environment), research (analysis of the problem) and design process (from macro to micro) should be followed. Similarly, Bocanegra-Herran (2019) develops a project process, which should have four phases: graphic proposal (considering the terrain and spaces), design decisions (taking into account the areas of spaces and dimensions), sustainability aspects (with the community and the context) and the use of the space (being aware of its value).

Ríos-Gutiérrez and Sánchez-Macías (2022) propose a design methodology linked to University Social Responsibility (USR), which contains research and design stages, as well as three transversal activities: cooperation with external entities, interaction with the community and background analysis. They specify various phases such as: Identification of social and infrastructure problems, sizing, land determination, urban impact and project development from macro to micro. On the other hand, Burgos (2017) proposes three important phases within the design method: the analysis phase (study of the place, context and user), the problem phase (definition of the user and needs) and the design phase (design strategies based on the study).

Millán-Millán (2020), argues that design methods should be cyclical and iterative for appropriate improvements. It proposes a series of competencies to be followed in the process, such as: analysis and synthesis of the needs and context, proposing organizations and relationships between the project and the site, developing the formal and spatial proposal, drawing up graphics and defining the construction criteria. While Cardet (2019), proposes to follow a project process that includes first the study and analysis of a real contextual problem and then make design proposals as a solution to the problem. Martinez (2013), proposes a sequence of activities that must be followed in the design method to solve an architectural problem, which are: the correct identification of the problem, data collection and analysis, and the formulation of solutions.

Casares and Raya de Blas (2019), propose that, in order to develop a design method, the following phases must be taken into account: data collection, interpretation, elaboration and execution. They must demonstrate competencies in the elaboration of architectural and urban ideas, composition and constructive and structural aspects. While Burgos (2016) supports a project methodology in which four variables are identified: disciplinary knowledge (function, space, form and technology), situational knowledge (problem, needs, context), project thinking (reflection, exploratory) and project knowledge (research, proposal and representation). On the other hand, Heinzmann et al. (2015), argue that, in the architectural design process, there must be specific moments or sequences which are: inquiry - reflection, preconfiguration - production and proposal - articulation.

Rodríguez, Giordano and Domínguez (2018), propose that, within the project methods, theoretical, practical and cooperation aspects between teachers and students should be taken into account, in addition, the stages: sustenance of ideas, feedback and experiential activities should be carried out. For his part, Velázquez (2016) argues that there are three variables within the project development process: experimentation, reflection and concretion. Within this process, concepts of proportion, modulation and function must be incorporated through planes and volumes. While Pedreño (2018), argues that an important part within the design processes is the study of analogous cases prior to the development of projects to learn from them, avoid possible mistakes and determine possible design strategies.

Mundo (2020), proposes a project method linked to strategies of: work teams, analysis of the site, field visits, workshops with the inhabitants, presentation of proposals and communication of results for feedback. Similarly, Putallaz et al. (2018), sustain that experiential learning contributes in a positive way to apply the criteria of inclusion and accessibility within the project methods in architecture. These activities are related to the simulation of people with different abilities to measure the sensitizing effect on students. On the other hand, Martínez (2021) defines that the design processes should be evaluated based on three important competencies: the design imprint (support, proposal and formal presentation), the architectural research (problem, development and support) and the architectural program (strategies, procedure and support).

When studying research with a methodological approach, there is a general interest in proposing project methods and establishing a consensus for the generation of architectural projects. The topics found in the studies of this approach were diverse; however, they were ordered according to their orientation with the stages and topics indicated. It is found that two important stages are proposed to be followed: Research and Design.

These studies were first organized based on the Research stage. Therefore, the following topics have been identified: Problem Identification, User Analysis and Context Study as shown in Table 3.

Table 3

Authors of Methodological approach by subject in Research stage

Stage	Themes	Studies
Research	Identification of the problem	They indicate that there must be a clear and concrete definition of the problem to be addressed based on objective and real data (Bejarano, 2017; Burgos, 2016; Burgos, 2017; Cardet, 2019; Casares and Raya de Blas, 2019; Heinzmann et al., 2015; Martínez, 2013; Martínez, 2021; Millán-Millán, 2020; Ríos-Gutiérrez and Sánchez-Macías, 2022; Rodríguez, Giordano and Domínguez, 2018; Velázquez, 2016).
	User analysis	They point out the importance of the study and the link with users or the community, analyzing their characteristics and identifying their needs (Bocanegra-Herran, 2019; Burgos, 2016; Burgos, 2017; Casares and Raya de Blas, 2019; Martínez, 2013; Martínez, 2021; Millán-Millán, 2020; Mundo, 2020; Pedreño, 2018; Putallaz et al., 2018; Ríos-Gutiérrez and Sánchez-Macías, 2022).
	Context study	They stress that there must be a deep knowledge of the place and the real context linked, in addition, to the environment and sustainability (Bejarano, 2017; Bocanegra-Herran, 2019; Burgos, 2016; Burgos, 2017; Cardet, 2019; Martínez, 2013; Millán-Millán, 2020; Mundo, 2020; Ríos-Gutiérrez and Sánchez-Macías, 2022).

As can be seen in Figure 6, of the total of 16 studies focused on the Methodological aspect, 12 authors focus on Problem Identification, 11 on User Analysis and 9 on Context Study.

Figure 6

Number of studies of the Methodological approach by topic at the Research stage

Main topics in the research stage
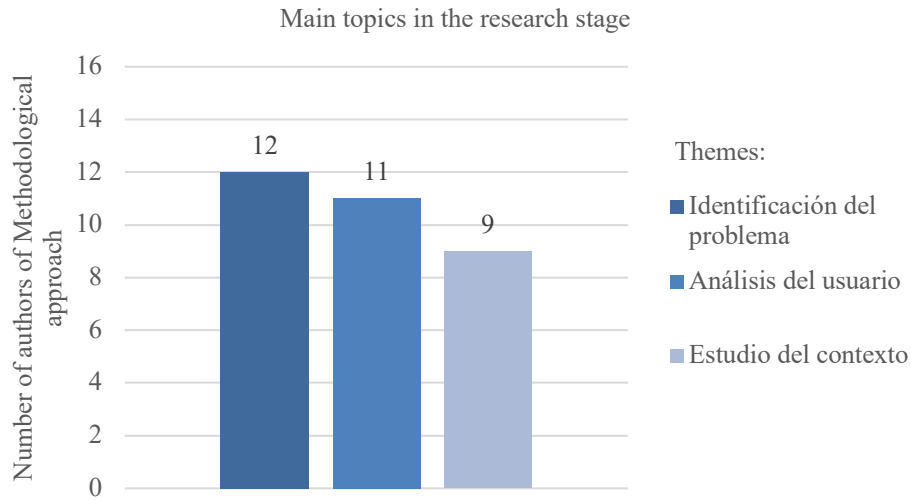
An analysis was made of the same 16 investigations, but based on the Project stage, to find concurrent themes. The following topics are identified: From general to specific, adequately provide the project and functional, spatial, formal and structural aspects as shown in Table 4.

Table 4

Authors of Methodological approach by subject matter in the Design stage

Stage	Themes	Studies
Projectual	From general to specific	They comment that the projective process must go from the macro to the micro, from the basic general ideas, to the architectural and constructive specificity (Bejarano, 2017; Bocanegra-Herran, 2019; Burgos, 2017; Cardet, 2019; Casares and Raya de Blas, 2019; Heinzmann et al., 2015; Martínez, 2013; Martínez, 2021; Millán-Millán, 2020; Mundo, 2020; Pedreño, 2018; Ríos-Gutiérrez and Sánchez-Macías, 2022; Rodríguez, Giordano and Domínguez, 2018; Velázquez, 2016).
	Adequately provide the project	They argue that the right size of the project should be defined based on user and context analysis (Bejarano, 2017; Bocanegra-Herran, 2019; Burgos, 2016; Burgos, 2017; Cardet, 2019; Casares and Raya de Blas, 2019; Heinzmann et al., 2015; Martínez, 2013; Millán-Millán, 2020; Mundo, 2020; Ríos-Gutiérrez and Sánchez-Macías, 2022; Rodríguez, Giordano and Domínguez, 2018; Velázquez, 2016).
	Functional, spatial, formal and structural aspects	They indicate that within the project methodology, aspects of function, space, form and structure should be worked on through images in two and three dimensions (Bocanegra-Herran, 2019; Burgos, 2016; Burgos, 2017; Casares and Raya de Blas, 2019; Cardet, 2019; Martínez, 2021; Millán-Millán, 2020; Mundo, 2020; Putallaz et al., 2018; Ríos-Gutiérrez and Sánchez-Macías, 2022; Rodríguez, Giordano and Domínguez, 2018; Velázquez, 2016).

Note. This table shows the classification of authors in relation to their subject matter in the Projective stage, including a summary of the aspects dealt with.

As shown in Figure 7, of the total number of studies focused on the design aspect, 14 authors focus on the theme From the general to the specific, 13 on Providing the project adequately and 12 on Functional, spatial, formal and structural aspects.

Figure 7

Number of Methodological approach studies per topic in the Design stage
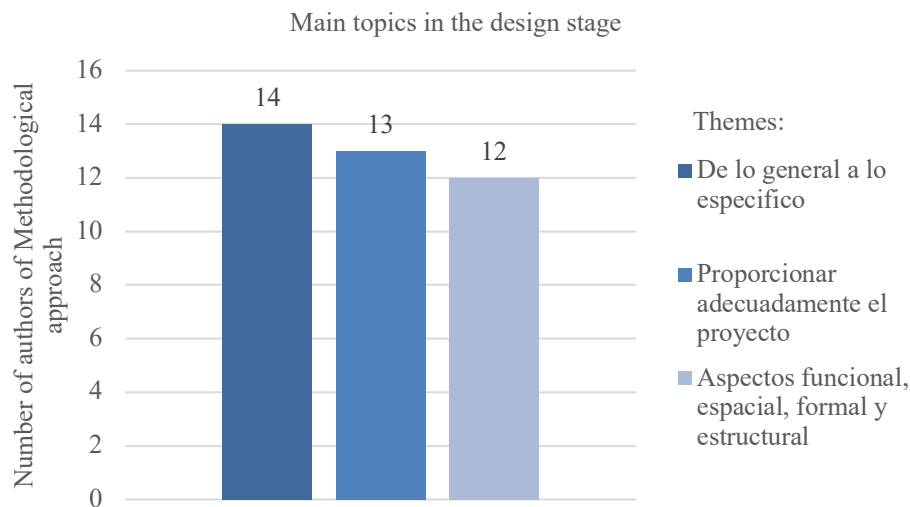
As for the studies with an analytical approach, the authors examine existing design methods to find their strengths or opportunities for improvement. Alvarado (2019), analyzes the project process and the link it has with the community, highlighting three important dimensions: participatory, contextual and projectual. He concludes that the work of architecture is to generate coherent projects through participatory and functional processes to improve the environment. On the other hand, Correal (2015) states that the teaching of project methods has been limited to copying and repeating professional practices, causing a lack of relevance to educational practices, he also comments that methods of analysis and innovation are relevant. Additionally, he argues that an important competency is contextual understanding and defines three important processes: Occupy the territory, plan the improvement and analysis of the site and composition of the project.

Figueroa and Guaraz (2021) explore various strategies for teaching project methodologies to study social space. It explores analysis tools for the development of projects through background information, oriented to achieve a coherent process between the concept and the form of the project. For their part, Muntañola and Saura (2013) argue that project-based pedagogical methods in architecture should not obey superfluous reasons without taking a contextual basis, as this generates inconsistencies in academic results, so a logical and coherent process should be followed. In the case of Fisch et al. (2014), the development of housing projects should promote accessibility and integration to achieve a relationship with the city context and foster social awareness.

Tami-Cortes and Coronel-Ruiz (2018), analyze the current situation of relationship between architecture faculties and their graduates to assess their social impact. The authors recommend that follow-up processes be carried out to identify possible future improvements in academic practices and their impact on society. As for Montoro (2018), he analyzes soft skills in teaching practice in the faculty of architecture to assess the impact that learning is generated to develop architectural projects. They conclude by distinguishing the most important ones: assertiveness, empathy and good listening.
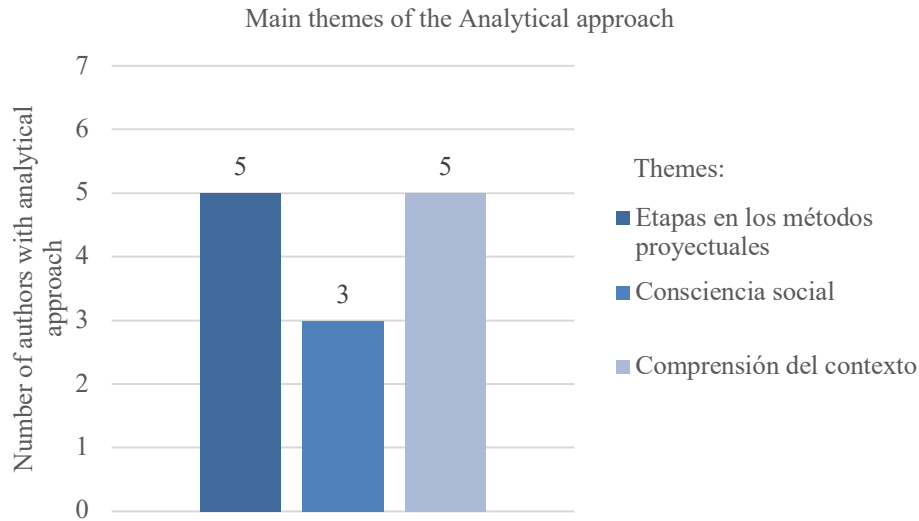
According to the study of research with an analytical approach, there are recurring themes that are of interest to the authors. These themes are as follows: Stages in the project methods, Social awareness and Understanding the context, which have been organized in Table 5.

Table 5
Analytical approach authors by subject

Themes	Studies
Stages in design methods	They determine that the logical sequence of steps is important to ensure obtaining a coherent project (Alvarado, 2019; Correal, 2015; Figueroa and Guaraz, 2021; Montoro, 2018; Muntañola and Saura, 2013).
Social awareness	They indicate that society and community should be important axes guiding the projective method (Alvarado, 2019; Fisch et al., 2014; Tami-Cortes and Coronel-Ruiz, 2018).
Understanding the context	They point out that knowledge of contextual characteristics is imperative to develop projects (Alvarado, 2019; Correal, 2015; Fisch et al., 2014; Muntañola and Saura, 2013; Tami-Cortes and Coronel-Ruiz, 2018).

Of the total number of studies focused on the Analytical aspect, 5 authors focus on Stages in project methods, 3 on Social awareness and 5 on Understanding the context as shown in Figure 8.

Figure 8

Number of studies of the Analytical approach by topic

Main themes of the Analytical approach

Themes:
- Etapas en los métodos proyectuales
- Consciencia social
- Comprensión del contexto

On the other hand, according to the Reflective approach studies, researchers meditate on the current reality of design methods and their influence and impact on society and context. Bermeo and Echevarría (2022) reflect on the importance of the integrative professorship for the development of design methods in architecture, taking into account conceptual and research elements, encouraging participation, field analysis and teaching support. For this reason, they analyze the current state of the academic curriculum, arguing that it must be constantly updated. On the other hand, Medina et al. (2017), analyzed the lack of systematization and specificity of the concepts that are transmitted to architecture students. To this end, they analyzed cases of previous educational experiences in project workshops. Their results point to contradictions within the project development process due to the lack of specificity and detail in the communication of ideas and concepts. While Hidalgo (2020) reflects on the pedagogical assumptions that are included in the methodologies of project development, which are interdisciplinarity, the participatory method and practice.

Martínez and Valdés (2020), reflect on the awareness of the practice of environmental care values and the reduction of social differences from the development of architectural projects. However, they comment that tangible results are not yet evident due to the disconnection of the methods with social and environmental characteristics, so it is important to review the teaching staff and the institutional policy. Fernández et al. (2018) reflect on the university's commitment to improving society through architectural projects. They mention that environmental, contextual and economic variables must be considered in order to develop equitable projects. It tells us that social problems must be addressed integrated to the conditions of the environment. While Castro-Mero (2020), studies and meditates on the impacts on the learning processes of architecture students in relation to Covid-19 through a documentary review. It is concluded that forward-

looking education for architects should encourage the use of digital tools and competencies that benefit society and the environment.
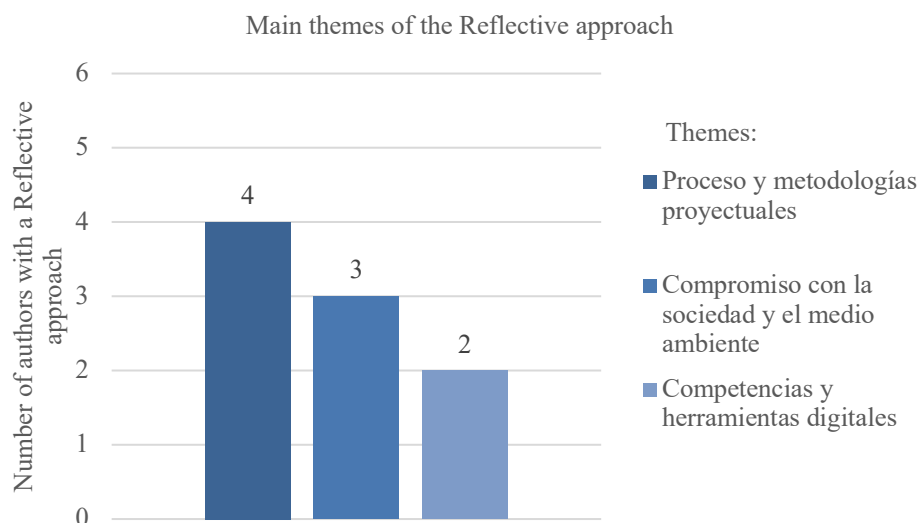
According to what has been studied in relation to the analysis of research with a reflexive approach, a review is made of the current methods, characteristics and values put into practice in the development of architectural projects. In these investigations we find recurrences of reflection on the themes of: Project process and methodologies, Commitment to society and the environment, and Digital competencies and tools, which are shown in Table 6.

Table 6
Authors with a Reflective approach by subject

Themes	Studies
Project process and methodologies	They reflect on the methods, activities and guidelines to carry out a project properly (Bermeo and Echevarría, 2022; Hidalgo, 2020; Martínez and Valdés, 2020; Medina et al., 2017).
Commitment to society and the environment	They meditate on responsibility in the development of projects for the improvement of society and context (Castro-Mero, 2020; Fernández et al., 2018; Martínez and Valdés, 2020).
Digital skills and tools	They reflect on the tools used in project methods and the competencies to be promoted (Castro-Mero, 2020; Hidalgo, 2020).

Of the total number of studies focused on the Reflective aspect, 4 researchers meditate on the Process and project methodologies, 3 reflect on the Commitment to society and the environment, while 2 focus on Competencies and digital tools as can be seen in Figure 9.

Figure 9
Number of studies of the Reflective approach by topic

Main themes of the Reflective approach

Themes:
- Proceso y metodologías proyectuales
- Compromiso con la sociedad y el medio ambiente
- Competencias y herramientas digitales

Finally, on the Pedagogical approach research, the authors propose activities and didactic strategies that should accompany the development process of architectural projects. Valdivia (2019) comments that, in the educational field, project-based learning fosters critical thinking in architectural education. It proposes six stages of the pedagogical strategy, which are: mission and participants, diagnosis, objectives, planning, implementation and application. While Arteaga (2019) argues that collaborative learning is fundamental for project development, as teamwork and interpersonal skills are fostered. The importance of skills such as responsibility, listening, empathy, punctuality and tolerance are highlighted in order to achieve collaboration and success in the development of projects. On the other hand, Perlaza and Betancourt (2018) elaborate an innovative pedagogical proposal that includes reflection on accessibility and equity and recognition of the impact of architectural projects on the community. This was achieved through discussions, empathy experiences with users, practical workshops and participatory talks.

Martínez et al. (2020), propose a methodology for project development in which ten important axes should be taken into account: The internal context of the workshop, the external context, collaboration and cooperation, equipment, the role of the teacher, the role of the student, teaching quality, inclusion and diversity, evaluation and time. While Sandoval (2018) argues that training in the development of architectural projects is important to be able to solve problems and improve the quality of life of populations. He argues that there are three formative elements: practical training, social responsibility and the teaching role, key points for the training of architects and for fostering critical thinking and the improvement of society. On the other hand, Torres and Padrón (2014) stress the importance of knowing how to translate social needs into projects and tell us that the pedagogical foundations for the training of architects who are at the height of society are the development of values and responsibility, having as critical characteristics: the reflective, participatory, creative, problémico and collaborative.

Based on the analysis of research with a pedagogical approach, an interest is identified in proposing and implementing activities that encourage reflection and criticism of the different social realities, in addition to encouraging participation through workshops and collaborative activities. In these studies we frequently find the topics of: Reflective, creative and critical activities, Conversations, lectures and workshops, and Project and problem-based learning, as shown in Table 7.

Table 7
Pedagogical approach authors by subject matter

Themes	Studies
Reflective, creative and critical activities	They determine that within the project methods critical and reflective thinking should be encouraged (Martínez et al., 2020; Perlaza and Betancourt, 2018; Torres and Padrón, 2014; Sandoval, 2018; Valdivia, 2019).
Talks, lectures and workshops	They indicate that the process for project development should be enhanced through activities that encourage the sharing of ideas and experiences (Martínez et al., 2020; Perlaza and Betancourt, 2018).
Project and problem-based learning	They point out that collaborative learning is key to solve problems and propose projects (Arteaga, 2019; Martínez et al., 2020; Sandoval, 2018; Valdivia, 2019).

As shown in Figure 10, of the total number of research studies linked to the pedagogical approach, 4 are related to proposing reflective, creative and critical activities, 2 to discussions, talks and workshops, and 4 to project and problem-based learning.

Figure 10
Number of studies on the Pedagogical approach by topic
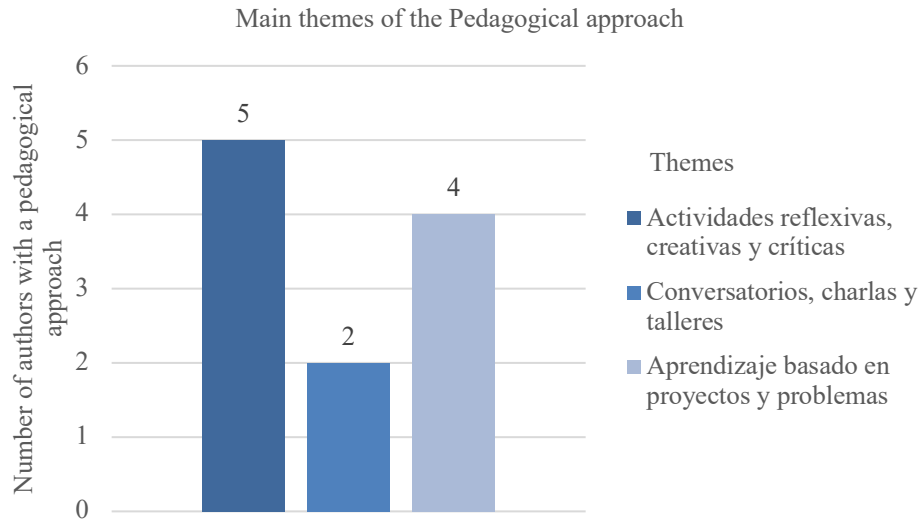
Relevant variables

When analyzing criterion C7 of important variables, four variables are identified that lead the research topics oriented to project methods in the academic field of architecture, which are: the impact on the context and society, the activities and tools, the coherence in the process and the project specificity.

As shown in Table 8, an analysis was made of the linkage of each topic with respect to each variable identified.

Table 8
Relevant variables in studies on the subject

Themes	Consistency in the process	Project specificity	Impact on context and society	Activities and tools
Methodological Approach				
Identification of the problem			x	
User analysis		x		
Context study			x	
From general to specific	x			
Adequately provide the project		x		
Aspects: functional, spatial, formal and structural		x		
Analytical Approach				
Stages in design methods	x			
Social awareness			x	
Understanding the context			x	
Reflective Approach				
Project process and methodologies	x			
Commitment to society and the environment			x	
Digital skills and tools				x
Pedagogical Approach				
Reflective, creative and critical activities				x
Talks, lectures and workshops				x
Project and problem-based learning				x

An analysis was made to identify the percentages occupied by each topic in relation to the important variables identified. (see figure 11)

Figure 11
Percentage of topics per identified variable

Relevant variables
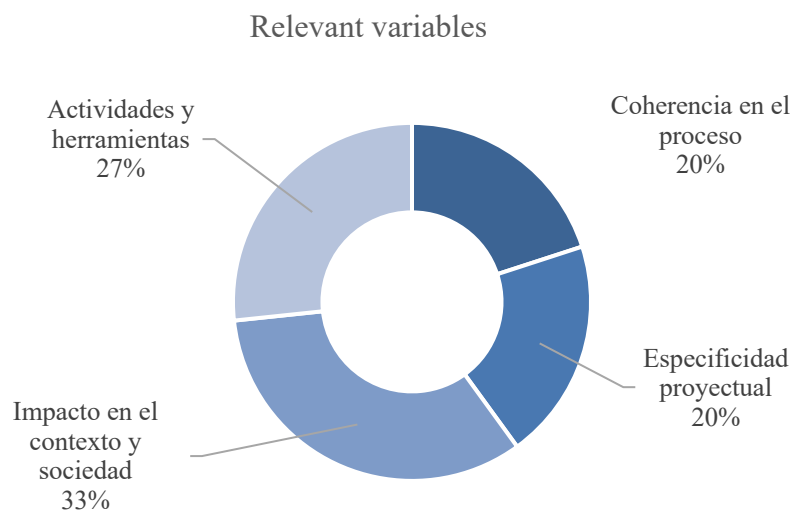
It is obtained that 33% of the topics are linked to the Impact on the context and society, being these the most important, 27% to the Activities and tools in the project

process, 20% of the topics are linked to the Coherence in the process, while 20% to the project Specificity.

Discussion and conclusions

This article identifies that the highest output per year of research on the subject is in 2018, where an increase in interest in publishing on projective methods is seen. On the other hand, 77% of the studies are articles, while the countries with the highest number of publications are Argentina, Colombia and Peru. The methodology applied in these studies is predominantly qualitative, so it is understood that, in order to study the project method, it is necessary to describe and characterize the stages and activities that take place there, oriented to specificity.

Four major approaches were identified: Methodological, Analytical, Reflective and Pedagogical, being that the greatest interest falls on the first one. The importance of the Methodological approach is due to the interest and concern for the establishment of a structured guide or sequence of steps to develop architectural projects, since the frequent problem is the lack of coherence and logic in the development of projects.

The findings found in the studied research suggest that the most important topics oriented to project development methods for teaching in architecture are related to: problem identification, understanding and commitment to the context and society, and the stages, activities and tools in the project method. Finally, four relevant variables were identified and established that lead the project research topics, which are: Impact on the context and society, Activities and tools, Coherence in the process and project specificity. Of these, the first is the most important and of greatest concern in the research analyzed, being considered fundamental in the design process.

This study was limited to research in Spanish, the vast majority of which was from Latin America, so that future studies can take into account studies in other languages in order to have broader and more diverse samples. The relevance of the information presented in this article lies in the identification of data and variables closely related to the recurring themes in the research studies, which represents an important contribution and guide for future analytical or reflective studies as well as for future proposals of design methodologies for architectural education.

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