

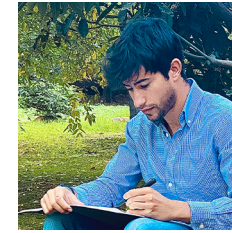
## Thinking by Hand: Collage as Visual Epistemology in the Digital Age

This text examines collage as a visual epistemology capable of activating spatial forms of thought that are especially relevant in architectural education. Based on the hypothesis that collage is not only a technique of assembly but a mode of knowledge that articulates analysis, interpretation, and creation, the research shows how its practice reactivates the materiality of the graphic process in a context dominated by digital immediacy. Operations such as cutting, juxtaposing, and layering emerge as critical gestures that allow reality to be decomposed and recomposed from new perspectives.

The study is grounded in a teaching experience in which first-year architecture students reinterpret fragments from Georges Perec's *Life: A User's Manual* through analog collages. Through this exercise, the research observes how the translation from text to image activates a narrative and speculative form of thinking that transcends mi-

mesis. The methodology unfolds sequentially: attentive reading of the fragment, identification of atmospheres and spatial relations, material exploration through montage, and collective discussion of the results. This process reveals how collage operates as a device that generates visual hypotheses on inhabitation while making visible the pathway of thought.

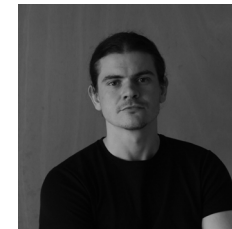
From a theoretical and methodological perspective, the article situates collage in an intermediate territory between recording and invention, between memory and anticipation, aligning it with approaches that understand drawing as a research instrument. In its pedagogical dimension, the results show that collage fosters interpretive autonomy and critical thinking, consolidating itself as an experimental laboratory for rethinking the relationship between representation, knowledge, and creation in contemporary architectural education.



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**Keywords:**  
collage; visual thinking; representation; pedagogy; graphic epistemology

## 1. INTRODUCTION. THINKING WITH THE HAND IN THE DIGITAL AGE

In the contemporary context of architectural education, the widespread use of digital tools has transformed the ways in which images are produced and consumed. The speed and ease with which graphic representations are generated today tend to shift attention from the process toward the final result, fostering an immediate and uncritical relationship with the image. In this scenario, graphic practice runs the risk of losing its status as an instrument of thought and becoming merely a means of visualization. As Robin Evans pointed out, representation should not be understood as a neutral channel for transmitting ideas, but as a space for translation in which thought is transformed through graphic action (Evans, 1995). In this context, various contemporary approaches have emphasized the need to recover graphic practices that integrate thought and action as part of the same formative process, understanding drawing not only as representation but also as a form of research (Fracari, 2011).

In response to this drift, it becomes relevant to recover graphic practices that restore the cognitive and operative dimension of manual making. Among these, collage occupies a unique position. Far from being merely a compositional technique or an expressive resource, collage can be understood as a knowledge device based on fragmentation, selection, and the assembly of heterogeneous elements. These operations introduce discontinuity, ambiguity, and material resistance into the graphic process, forcing conscious and reflective decision-making. From a phenomenological perspective, this direct involvement of the body and the hand reactivates a form of embodied thinking which, as Juhani Pallasmaa argues, is essential for maintaining the link between perception, action, and spatial understanding (Pallasmaa, 2022). The value of collage as a cognitive tool is not limited to the experimental or pedagogical sphere. In contemporary architectural culture, visual montage, superimposition, juxtaposition and the assembly of fragments are used as design-thinking

strategies that work through partial relationships, visual memories and non-linear readings of place. Recent research has framed architectural collage as both an analytical and a generative method capable of constructing layered spatial narratives rather than simply depicting a completed form (Shields, 2023; Aulia et al., 2023). In these practices, collage acts not only as a means of representation but also as a heuristic mechanism through which spatial hypotheses can be explored and design thinking articulated through images.

From this perspective, collage occupies a middle ground between analysis and invention. It does not reproduce reality mimetically, nor does it construct it *ex novo*. Rather, it breaks it down and recomposes it through graphic operations, making the thought process visible. This condition is particularly relevant in architectural education, where representation not only communicates spatial solutions but also actively participates in the construction of knowledge.

Based on these premises, this article analyses a teaching experience with first-year architecture students, in which collage is used as a method for translating narrative texts into graphic and spatial configurations. The aim is not to evaluate collage as a formal outcome, but to examine its function as an epistemological and pedagogical device capable of activating forms of visual and spatial thinking that rarely emerge through conventional graphic methods.

## 2. COLLAGE AS VISUAL EPISTEMOLOGY IN THE FIELD OF GRAPHIC SCIENCES

Within the field of graphic sciences, representation has traditionally been understood as a means of describing, communicating, or verifying a previously conceived reality. However, various theoretical approaches have questioned this instrumental conception of drawing, emphasising its capacity to produce knowledge through the very act of representing. In this context, collage is a particularly significant practice, as it makes explicit the constructive, non-mimetic nature of graphic representation. By working with pre-

existing fragments, collage shifts the emphasis from formal continuity to the relationship between parts, revealing the image as a field of negotiation among heterogeneous elements.

From a critical perspective, collage can be understood as a logic of montage that challenges unitary and closed systems of representation. Rosalind Krauss has highlighted how practices based on fragmentation and assembly disrupt the idea of the work as an organic unity, bringing discontinuity and the processual condition of the image to the fore (Krauss, 1985). In the graphic domain, this condition is particularly relevant because it makes the intellectual operations involved in constructing meaning visible rather than concealing them behind an appearance of formal coherence. In this sense, collage not only presents a result but also makes the path leading to it legible. Cuts, overlaps and juxtapositions function as material traces of graphic and conceptual decisions, turning the image into a record of the thought process. This capacity to make the cognitive dimension of drawing visible aligns collage with approaches that conceive representation as a form of research. As Marco Fracari argues, architectural knowledge is not limited to what is represented; it emerges through the act of drawing itself, in a slow and reflective interaction with graphic material (Fracari, 2011).

The development of digital technologies has considerably expanded the operational field of collage, introducing new forms of fragmentation and montage. Digital collage enables virtually unlimited superimposition, transparency and reversibility, modifying the relationship between image, time and graphic decision-making. Recent studies of post-digital architectural imagery show how contemporary collage deliberately blurs the boundary between analogue and digital procedures, reviving the visual logic of *avant-garde* montage while transforming its technical and temporal conditions (Shin & Choi, 2022). However, as Mario Carpo warns, the apparent freedom of the digital environment can dilute awareness of the process unless it is accompanied by critical reflection on modes of image production (Carpo, 2011). From

this perspective, the value of collage does not lie in its medium, whether analogue or digital, but in the epistemological logic it activates: a way of thinking through the critical composition of fragments.

Hybrid practices that combine manual and digital procedures reinforce this in-between condition of collage. By alternating between physical materiality and computational manipulation, they keep the tactile and decision-making dimensions of the graphic process active, avoiding both the rigidity of conventional drawing and the uncritical automation of the digital image. Contemporary research likewise describes collage as a design-based mode of inquiry in which collecting, selecting, layering and recomposing fragments become explicit research operations (Wehmeyer, 2021; Shields, 2023). In this sense, collage acts as a transversal device capable of integrating different graphic languages within a shared cognitive framework. Situated in the field of graphic sciences, collage can be understood as a visual epistemology: a mode of knowledge that does not separate representation and thought, but rather articulates them in the same operational process. This condition makes it a particularly relevant tool for addressing complex, ambiguous or open-ended problems, in which representation cannot be limited to describing a solution, but must actively participate in its construction.

This reading of collage as a cognitive device provides the theoretical framework for the teaching experience analysed in this article. Far from treating collage as an auxiliary or merely expressive technique, the workshop proposes it as a graphic method of inquiry capable of activating processes of interpretation, translation and spatial speculation in architectural education. Recent pedagogical research similarly identifies collaging as a method that supports critical thinking, metacognitive reflection and design decision-making (Pradhan, 2024).

### 3. TEACHING CONTEXT AND INTEGRATION OF THE EXPERIENCE INTO THE COURSE

The experience analysed in this article took place within Architectural Drawing 1, a first-year course in the Bachelor's Degree in Architecture at Universidad CEU Cardenal Herrera (Valencia, Spain). The course aims to equip students with the graphic language required to analyse and express the configuration of architectural spaces. Students develop observational skills and learn the principal systems and techniques for representing three-dimensional objects and spaces, which constitute the language of design drawing. The course therefore introduces both representational practice and graphic thinking. At this initial stage of training, students encounter for the first time the need to translate ideas, references and readings into spatial configurations while simultaneously building their own graphic vocabulary. The course is oriented not only towards acquiring technical skills but also towards understanding representation as an active tool for interpretation and knowledge construction.

Within this framework, the collage workshop was conceived as a specific activity for introducing an alternative approach to graphic thinking. It was not an isolated or exceptional exercise, but an integral component of the course, complementing more conventional methods of representation. Its primary objective was to shift the focus temporarily from technical precision to critical interpretation, foregrounding the processes of reading, selection and graphic decision-making.

The decision to work with first-year students was deliberate. At this early stage of training, when graphic habits are not yet firmly established, it is particularly relevant to introduce devices that encourage conscious reflection on one's own work and position representation as a process of thought rather than merely a formal result (Schön, 1992). Because collage requires neither specialised technical skills nor advanced prior knowledge, it provides an accessible tool that places students on a broadly comparable starting level. This condition fosters a more open approach

to representation, centred on the construction of meaning rather than on formal correctness.

The proposed activity is particularly relevant in a context marked by the cultural and educational diversity of the students, with first-year students entering the course with widely varying levels of prior experience in graphic representation. In an initial phase characterised by a lack of group cohesion and significant differences in individual skills, collaborative work proves to be an effective strategy for promoting interaction and shared learning. Since the exercise has low technical demands, no specific prior skills are required, which reduces initial insecurity and facilitates the participation of all students. Likewise, one of the most frequent difficulties detected in early courses is the limited understanding of drawing as an operational tool for the development of design thinking. In this regard, the collage technique allows for a more direct visualisation of the relationship between representation and design, favouring a more intuitive and motivating approach to the generation of one's own proposals.

From a pedagogical perspective, the introduction of collage into the subject responds to the aim of fostering a more reflective relationship between text, image and space. The activity was designed as a translation exercise, in which students had to reinterpret fragments of a literary work through non-mimetic graphic procedures. This approach allowed attention to shift from the literal reproduction of a form toward the construction of an atmosphere, a spatial situation or a narrative logic, aligning with the educational objectives of the subject.

The workshop was also conceived as a collective experience, both in its development and in its discussion phase. Group work and the sharing of results encouraged the verbalisation of graphic decisions and the confrontation of different interpretations, reinforcing the critical dimension of the exercise. In this sense, collage functioned not only as a tool for graphic production but also as a catalyst for debate and shared reflection within the classroom.

Overall, the teaching context in which the experience

rience is situated allows us to understand the collage workshop not as an isolated activity, but as part of a broader pedagogical strategy aimed at introducing students to an active and cognitive conception of representation. This integration is essential for properly interpreting the results of the exercise and for placing the subsequent analysis in relation to the course's educational objectives.

#### 4. METHODOLOGY: FROM TEXT TO GRAPHIC INQUIRY

The teaching experience was structured around a qualitative, process-based methodology that placed the work process at the centre of learning, in line with approaches that advocate meaningful learning and reflection on action in university education (Biggs, 2005). Rather than functioning as an exercise for verifying predetermined results, the workshop was designed as a means of inquiry in which the process assumed greater importance than the final product. The methodology therefore aligns with approaches that understand graphic practice as a means of generating knowledge rather than merely as a tool for representation.

The workshop was organised into a sequence of clearly differentiated but interrelated phases, which allowed students to be guided progressively from reading the text to the graphic construction of the collage. In the first phase, students were asked to carefully read selected excerpts from Georges Perec's *Life: A User's Manual*. The goal of this reading was not to achieve an exhaustive literary understanding of the text, but rather to identify elements that could be translated graphically: atmospheres, spatial relationships, objects, characters, narrative tensions, or situations of inhabiting within the story.

Based on this reading, the students worked in small groups, developing a collective analysis phase in which possible interpretations of the text were discussed. This stage proved key to activating non-linear thinking, based on associations, evocations and partial selections, which would later be transferred to the graphic plane. The tea-

cher's role in this phase focused on guiding the interpretation process, avoiding illustrative or descriptive readings and instead encouraging open and speculative approaches.

The central phase of the workshop consisted of producing the collage itself. To do this, students primarily worked with analogue procedures, using basic materials such as paper, magazines, photocopies of the text, scissors and adhesives. The choice of a manual medium responded to the aim of introducing material and temporal resistance into the graphic process, forcing students to make irreversible decisions and assume the formal consequences of their choices. The collage was conceived as a space for negotiation between fragments, where each cutting or overlapping operation involved taking an interpretative position.

During this phase, observation of the working process was one of the principal methodological tools. Beyond the final compositions, attention was paid to discussion dynamics, questions raised, discarded decisions and changes of strategy throughout the exercise. This observation made it possible to identify recurring patterns in how students translated the text into images and addressed representational challenges without resorting to mimetic solutions.

Once the collages were completed, the groups presented and discussed them collectively. Each group explained the decisions made and the relationship between the source text and the resulting graphic composition. This phase made the cognitive operations involved in the process explicit and enabled different interpretations of the same narrative fragment to be compared. The discussion was not intended to evaluate the correctness of the result, but to analyse the graphic and conceptual procedures involved.

To complement the observation and discussion in the classroom, information-gathering instruments were designed to capture the students' own perceptions of the exercise. These included reflection forms that invited participants to verbalise their experience, the difficulties encountered, and the relationship between the text, the graphic

process, and the final result. These instruments were conceived as tools to support reflection and awareness of the learning process, rather than as mechanisms for quantitative assessment, in line with university teaching models focused on the development of skills and student reflection (Zabalza Beraza, 2003).

The questionnaires [1] were completed by 52 students and combined closed-ended questions with open-ended answers aimed at capturing the students' perceptions of the exercise. Overall, the results show a clearly positive assessment of collage as a learning tool. Most students felt that the exercise helped them to imagine the space described in the text in a new way, as well as to better understand the relationship between image, narrative and space. Additionally, a significant proportion of the students identified the process as a way of 'thinking with their hands,' recognising the active role of manipulation and decision-making in the construction of meaning.

Among the most highly valued aspects were the identification of key ideas in the text as a starting point for graphic construction and the possibility of working through open, non-mimetic interpretations. These results are not interpreted statistically, but as evidence that supports the qualitative reading of the teaching experience. The main outcomes of the questionnaire are summarised below, highlighting the most relevant trends in the students' perceptions (Table 1).

#### 5. ANALYSIS OF THE COLLAGES: GRAPHIC OPERATIONS AND SPATIAL THINKING

The collages produced during the workshop make it possible to observe directly how collage functions as a device for spatial thinking rather than merely as a graphic result. A representative selection was examined to identify different strategies for translating the literary text into spatial configurations. The selection was not based on formal quality but on the diversity of graphic operations and interpretative approaches activated by the students. The collages are therefore analysed as graphic hypotheses: not as illustrations of the

story, but as visual constructions that condense a particular interpretation of space, inhabitation or the atmosphere suggested by the text.

In some of the works analysed, space is constructed through a sequential logic, in which fragments are organised as linked episodes rather than as a unified composition (Fig. 1). The horizontal arrangement of the ensemble and the visual continuity between scenes suggest a reading of space as a journey, where interior and exterior are articulated through gradual transitions. The coexistence of domestic scenes, landscapes and human figures generates a hybrid spatiality that does not refer to a defined architectural typology, but to an experience of inhabiting in constant transformation. The absence of a single point of view and the overlapping of temporal and visual contexts reinforce the narrative character of the collage, which translates the literary text into an open spatial sequence based on relationships rather than stable forms.

Other collages adopt a radically different strategy, based on fragmentation and spatial discontinuity (Fig. 2). In these cases, space is constructed from clearly dissociated fragments, separated by voids that interrupt any continuous reading. Each set of images functions as an autonomous unit, connected to the others only through conceptual or symbolic associations. The juxtaposition of collective and individual scenes, as well as



Figure 1. Collage produced by students. Source: Archive of Universidad CEU Cardenal Herrera.

Table 1. Main Results of the Questionnaire (n=52).

| Analysed aspect                                                                                                                                                                                    | Result                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>Overall assessment of the exercise</li><li>Understanding the space through collage</li><li>“Thinking with the hands.”</li><li>Most useful strategy</li></ul> | <ul style="list-style-type: none"><li>Mostly positive</li><li>Significant improvement</li><li>Experience is acknowledged by most students</li><li>Identification of key ideas within the text</li></ul> |

the contrast between open landscapes and closed interiors, generates a field of tension that replaces the traditional geometric organisation of space. The void between fragments does not act as a neutral absence, but as an active element that forces the viewer to mentally reconstruct spatial relationships, making montage a central cognitive operation.

In other collages, the focus shifts towards a more introspective exploration of space, linked to domestic experience and memory (Fig. 3). Through the accumulation of fragments of interiors, everyday objects, and human figures, space is constructed as a constellation of intimate situations rather than as a defined architectural container. The overlapping of planes and the dissolution of boundaries between rooms generate an ambiguous spatiality, in which interior and exterior become blurred. This ambiguity reinforces a reading of space based on lived experience and perception rather than on functional or typological organisation, positioning collage as a privileged medium for representing subjective dimensions

of inhabiting.

In the collage shown in Figure 4, space is organised according to a logic of polarity: on the left, an exterior domain is constructed, while on the right, a compact, dark interior dominates, articulated by large vertical planes that suggest a cupboard or a habitable volume. Rather than spatial continuity, the montage proposes a structure by fields: two coexisting spatial regimes that are not connected by gradual transition, but by tension and contrast. The insertion of floating elements, such as the yellow object in the upper left or the small circular element in the upper right, reinforces the non-mimetic character of the space, introducing signs that function more as markers of atmosphere and temporality than as locatable objects. From an operational point of view, this collage demonstrates how spatial thinking emerges from the conflict between pieces: the relative scale of the figures, the density of the dark masses and the superimposition of heterogeneous fragments construct a hypothesis about inhabiting as an alternation between openness and closure. The representation does not seek to stabilise a "floor plan" or a perspective, but rather to formulate a spatial reading through affective and narrative relationships. In all cases analysed, the visibility of the cuts, overlaps and assemblages highlights the procedural nature of collage. Far from concealing the graphic operations, collages make the sequence of decisions that produced them legible, turning the image into a record of thought in action. The space represented does not appear as a closed result, but as a provisional construction arising from the negotiation between heterogeneous fragments.

Despite their formal and compositional diversity, all the works share a conception of space as a relational rather than mimetic construction. In none of the cases does collage act as a literal representation of the text. Instead, it serves as an exploratory device that translates narrative material into open spatial relationships. The differences between the collages cannot be reduced to individual style; they reveal distinct cognitive strategies of interpretation. This reinforces the hypothesis that



Figure 2. Collage produced by students. Source: Archive of Universidad CEU Cardenal Herrera

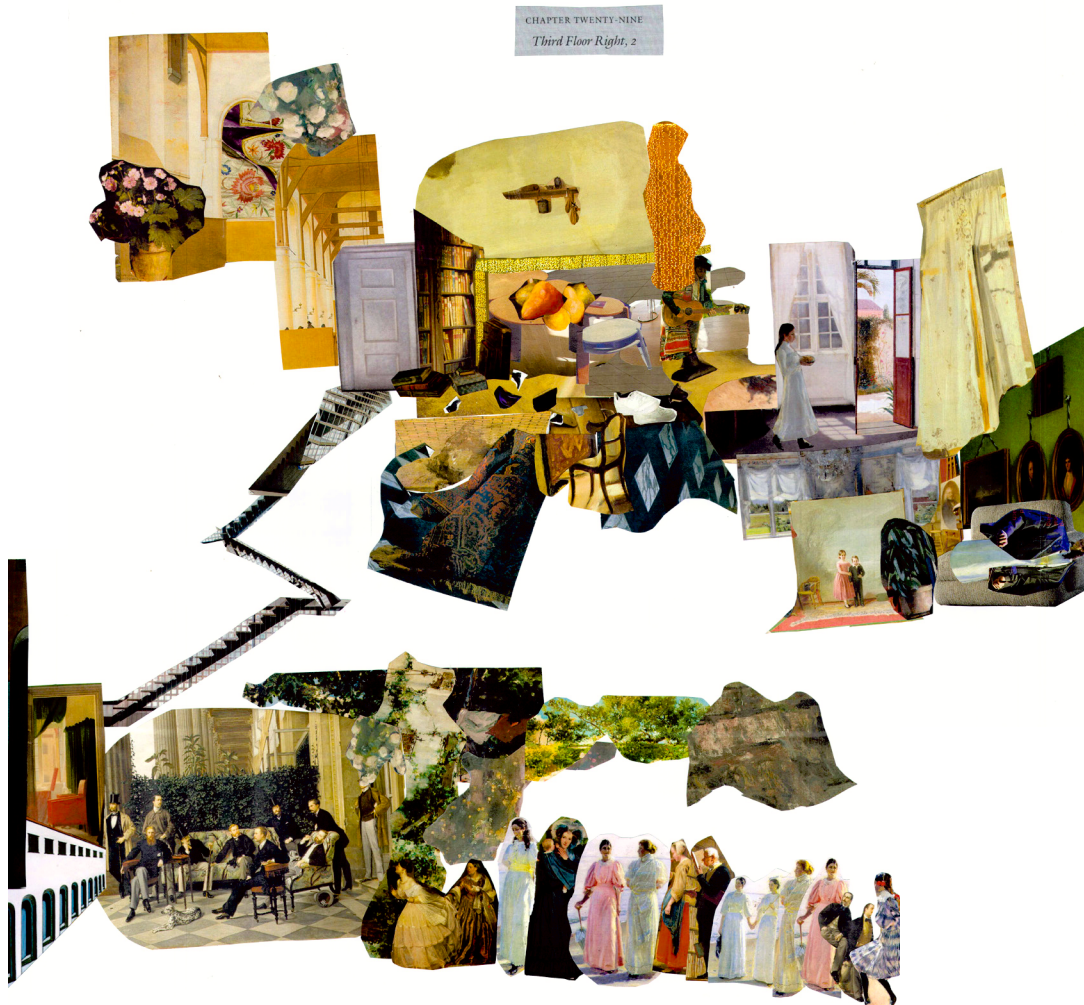


Figure 3. Collage produced by students. Source: Archive of Universidad CEU Cardenal Herrera.

collage functions as an epistemological tool capable of generating multiple spatial readings from the same narrative stimulus while making visible the thought process that leads to each graphic configuration.

## 6. PEDAGOGICAL AND COGNITIVE IMPLICATIONS OF THE USE OF COLLAGE

The analysis of the collages reveals several relevant implications from both pedagogical and cognitive perspectives. First, the use of collage in the classroom encourages an active and autonomous approach to graphic representation. In the absence of a single correct solution or predefined formal model, students must adopt their own interpretative position and make graphic decisions grounded in their reading of the text and in the relationships established among the visual fragments.

From a cognitive standpoint, this autonomy translates into learning through exploration and direct experience, in which knowledge emerges from action and reflection on the process itself (Kolb, 1984). Collage makes the internal logic of graphic decisions visible, enabling students to recognise how operations such as fragmentation, juxtaposition and superimposition generate spatial meaning. Recent research in interior-architecture education also links collaging with interpretation, analysis, inference, evaluation and self-regulation in design decision-making (Pradhan, 2024). This explicit articulation of the process contributes to a reflective attitude towards representation, in which drawing ceases to be an automatic procedure and becomes an instrument of inquiry. In this sense, collage reinforces a conception of drawing as an instrument for thinking: representation does not merely describe a pre-existing reality but actively participates in its construction (Sáinz, 2005). Moreover, collage encourages a non-mimetic relationship with space. By dispensing with normative systems of representation, such as perspective or conventional floor plans, students explore alternative ways of constructing spatiality based on atmospheres, relationships and narra-

Another relevant aspect is collage's ability to integrate intuitive and rational dimensions of thought. Working with visual fragments activates free associations, evocations and memories, yet these must be organised through conscious decisions in order to construct a coherent composition. This balance between intuition and control is fundamental in



architectural education, where the project requires creativity and rigour to be articulated within a single process.

In this sense, collage can be understood as a pedagogical laboratory in which modes of thinking specific to architectural design are rehearsed without the technical or regulatory burden that often accompanies design exercises. Positioned between analysis and creation, collage allows students to become familiar with projective logic through an accessible and critical approach. From this perspective, the experience confirms the role of representation as a space of mediation between knowledge and design, in which thinking and drawing form part of the same intellectual process (Solà-Morales, 1995).

Finally, the experience highlights the potential of collage as a cross-disciplinary tool, capable of establishing links between disciplines and languages. Translating a literary text into a graphic configuration forces students to negotiate between word and image, narrative and space, meaning and form. This intersection of registers broadens the field of representation and reinforces the idea that architectural knowledge is constructed through multiple media and processes.

## 7. CONCLUSIONS

The analysis of the teaching experience presented here reaffirms collage as a relevant epistemological device in the graphic sciences and, in particular, in architectural education. Far from being an auxiliary technique or marginal expressive resource, collage has proved capable of activating visual and spatial thought processes that integrate analysis, interpretation and creation within a single graphic gesture.

Throughout this article, it has been shown that the value of collage lies in its operational logic rather than in its formal result. The operations of fragmentation, juxtaposition and montage not only produce images, but also make visible the cognitive process that underpins them. In this sense, collage allows representation to be understood as a field of negotiation and decision-making, in which

knowledge does not precede the graphic act, but emerges through it.

From a pedagogical perspective, the experience confirms that collage encourages students' interpretative autonomy and promotes a critical relationship with images. By presenting students with an open-ended problem—the translation of a narrative text into a spatial configuration—the exercise shifts the focus from technical correctness to the construction of meaning. This condition is particularly relevant in the early years of architecture studies, where the development of a reflective attitude towards representation is a fundamental educational objective.

Likewise, the workshop has demonstrated the ability of collage to function as a space for mediation between different registers: word and image, intuition and analysis, individual and collective. The classroom discussion of the works and the visualisation of the graphic processes have reinforced the shared dimension of learning, underlining the role of representation as a tool for thinking and communication, beyond its descriptive function.

In a context dominated by the immediacy of digital images, collage introduces a different temporality, marked by material resistance and the irreversibility of decisions. This condition does not imply opposition to the digital, but rather the possibility of articulating a critical counterpoint that enables the integration of analogue and digital procedures within a conscious and reflective logic. Collage thus emerges as a particularly suitable device for addressing the contemporary complexity of graphic practices.

Ultimately, this study proposes that collage be understood as an experimental laboratory for rethinking the relationship between representation, knowledge and pedagogy in architecture. Its capacity to make thought processes visible, activate non-linear forms of spatial reasoning and foster a critical attitude towards images gives it considerable potential within the graphic sciences. Rather than closing the discussion, the article opens further lines of research into analogue, digital and hybrid collage as methods of inquiry and learning in educational and design contexts.

## NOTE

[1] To ensure transparency of the process, the full questionnaire and response analysis can be accessed at the following link:  
<https://forms.office.com/Pages/AnalysisPage.aspx?AnalyzerToken=xhUqt1PihhS-oYMJuGY9cHGsrR3qr0Psp&id=7w4zNL4x0UySXqeQrHltMJ8agVDaDd5Psq-fuDXgk2pUNFQyMjdaRDlwRzBBMIhLWjA5U05HUElORi4u>

## REFERENCES

- Aulía, F. D. C., Paramita, K. D., & Yatmo, Y. A. (2023). Architecture as images: Using collage as space construction method. In Proceedings of the 6th International Conference of Contemporary Affairs in Architecture and Urbanism (ICCAUA 2023) (pp. 192-199). <https://doi.org/10.38027/iccaua-2023en0306>.
- Biggs, J. (2005). Calidad del aprendizaje universitario (P. Manzano, Trans.; 5th ed.). Narcea.
- Carpo, M. (2011). The alphabet and the algorithm. MIT Press.
- Evans, R. (1995). The projective cast: Architecture and its three geometries. MIT Press.
- Frascari, M. (2011). Eleven exercises in the art of architectural drawing: Slow food for the architect's imagination. Routledge.
- Kolb, D. A. (1984). Experiential learning: Experience as the source of learning and development. Prentice Hall.
- Krauss, R. (1985). The originality of the avant-garde and other modernist myths. MIT Press.
- Pallasmaa, J. (2022). Los ojos de la piel: La arquitectura y los sentidos (M. Puente Rodríguez, Trans.; 2nd ed.). Gustavo Gili.
- Pradhan, K. (2024). Investigating 'collage' as a tool for critical thinking in the concept development process of interior architecture. *New Design Ideas*, 8(Special Issue), 170-185. <https://doi.org/10.62476/ndisi170>.
- Sáinz, J. (2005). El dibujo de arquitectura: Teoría e historia de un lenguaje gráfico. Reverté.
- Schön, D. A. (1992). La formación de profesionales reflexivos: Hacia un nuevo diseño de la enseñanza y el aprendizaje en las profesiones. Paidós.
- Shields, J. A. E. (2023). Collage and architecture (2nd ed.). Routledge. <https://doi.org/10.4324/9781003126317>.
- Shin, W.-J., & Choi, C. (2022). A study on post-digital images in architecture: A comparative analysis of post-digital and avant-garde architecture collages. *Journal of the Architectural Institute of Korea*, 38(7), 91-101. <https://doi.org/10.5659/JAIK.2022.38.7.91>.
- Solà-Morales, I. de. (1995). Diferencias: Topografía de la arquitectura contemporánea. Gustavo Gili.
- Wehmeyer, S. (2021). Collage-based research and design. *Dimensions: Journal of Architectural Knowledge*, 1(1), 25-36. <https://doi.org/10.14361/dak-2021-0104>.
- Zabalza Beraza, M. Á. (2003). Competencias docentes del profesorado universitario: Calidad y desarrollo profesional. Narcea.