Syllabus

Design-Driven Research

Fuoco Amico 11

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Five Themes on Design-Driven Research

This issue presents the papers elaborated after the "Design Driven Research Seminar" held by Alessandro Rocca in 2024. The authors are Candidates for the Ph.D. Program of "Architectural Urban Interior Design" at the Department of Architecture and Urban Studies, Politecnico di Milano.

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Inspiration vs. Plagiarism: Nurturing Originality in Research

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“Architecture is the art and technique of designing and building, as distinguished from the skills associated with construction” (Gowans 2018).
Architectural design is a discipline that focuses on covering and meeting the needs and demands to create living spaces, using certain tools and, especially, creativity. Creativity, an area of pure intuition, must be based on a knowledge of past solutions applied to related problems, and creation is a process of adapting forms derived either from past needs or from past aesthetic ideologies to the needs of the present (Colquhoun1969). Therefore, designing with the help of precedents’ knowledge and constituting new knowledge cannot be defined as a mere copy in architecture. Research that considers precedent knowledge and its imitation should also consider the transforming processes of the knowledge and its media rather than merely focusing on precedent or knowledge (Özgür 2018).

The paper aims to excavate how to nurture originality by discussing five distinct stages: design-based research, research by reading, research by drawing, research by writing, and research by comparison. Each stage is a crucial component and step in the research process, especially for architectural research, which communicates architectural ideas beyond the range of just a project.
During these phases, researchers generate their unique and innovative thinking, contributing to the architecture field. The first phase, “design-based research,” compares the method of research by design and design-driven research, underlining the importance of shaping originality from the design-based method. In contrast, the subsequent four phases introduce four techniques and methods as tools in research to obtain vital knowledge and properly shape independent and creative thinking. The exploration of these

five stages intends to find the balance between drawing inspiration from existing works and avoiding the pitfalls of plagiarism.

Five Stages of the Research Process: Design-Based Research

Research in the field of architecture needs to interact and integrate with design in relation to the nature of architecture, which involves not only technique but also art. Architectural design is the art of drawing and crafting structures with acuteness and functionality in mind: “Architectural design, built and unbuilt, is able to communicate architectural ideas beyond the scope of the project itself” (De Walsche 2016). “Architectural research is an original investigation undertaken in order to generate knowledge, insights, and understanding based on competencies, methods, and tools that are proper to the discipline of architecture” (EAAE Charter 2022). The interactions of architectural design and architectural research present different forms regarding the varying targets and methods, such as research by design and design-driven research, which are very common in the research process. “Research by design” and “Design-driven research” are related concepts but have distinct emphases and approaches. The former, research by design, it is to consider design as a specific form of research or a valuable tool for research relating to spatial investigation. In contrast, the latter, design-driven research, is a method that emphasizes the combination between design and theory in the research process. Different from merely being a tool at a particular step, the design in the stage of design-driven research participates in nearly whole periods of research to understand the need, generate the methodology, set the design process, and examine the final research result.

Despite some distinctions between the

two stages, research by design and design-driven research share a common genesis and trajectory, commencing with the design phase of the research process. This foundational stage, intrinsic to architecture, is instrumental in upholding the paramount significance of aesthetics and originality, thereby endowing architects with an artist's identity rather than merely that of researchers or inventors. The design stage for research emerges as a pivotal period, functioning not only as a preparatory step but as a crucible for nurturing and fostering originality. Within this phase, researchers scrutinize the research topic and its status, delving into an extensive array of references to absorb pertinent knowledge. Subsequently, a dynamic process for researchers to the creative imagination, starting brainstorming sessions to delineate the methodologies and approaches that will guide their exploration. This iterative process, infused with inventive thinking, becomes the crucible in which the architect's originality is forged, with the evaluation of innovative approaches and the ingenuity of design thinking.

When designing a specific stage in research (in the research by design stage) or designing the overall ideas and overall situation in research (in the design-driven research stage), we can learn and draw on excellent ideas and ideas from other research. The method is the inspiration of our design, but we cannot wholly copy and follow the entire process with the same methodologies as others. Otherwise, we will lose innovation and become plagiarism.

Therefore, in architectural research, the design stage assumes a crucial role in distinguishing between research by design and design-driven research. Simultaneously, it serves as the incubator for nurturing individual innovative thinking, essential for shaping originality.

Fig. 1. Drawing for the stage of design-based research.

This stage critically discerns whether the design process in research is genuinely inspired by others or inadvertently slipping into the realm of plagiarism.

The Stage of Research by Reading

"Architecture is the discipline devoted to the creation, transformation and interpretation of the built environment and the articulation of space at various scales" (EAAE Charter 2022). It goes beyond mere design, encompassing the generation, documentation, and integration of theoretical content. Insights are gleaned by researchers from textual narratives and visual representations through the process of reading, enabling them to augment the design process and foster a profound comprehension. As researchers gain mastery over this knowledge, it transforms into a database, forming a cohesive network. This, in turn, empowers researchers to mold and cultivate their independent thinking.

Effective reading techniques play a pivotal role in the research process. Initially, the crucial step involves searching for relevant bibliographies, where having a clear perspective on the desired discoveries acts as a filtering tool for selection. Subsequently, the process of extracting valuable content becomes paramount. When delving into selected books, the challenge lies in reading the whole content of the book intensively or absorbing all knowledge comprehensively within a limited time. However, a strategic approach involves reading the initial 1-2 pages to grasp the research topics, the authors' introductory approaches, and the overall structure and sequence of paragraphs. Furthermore, at the phase when reading the main text, which typically follows a narrative order in books and essays, researchers have the flexibility to opt for specific chapters, enabling them to selectively extract the essential content that aligns with their research objectives, in this reading strategy, researchers can enhance their efficiencies a lot.

Nurturing originality in the “Research by reading” stage is the process of integrating and creating. In order to strengthen the argument, quote the example of reading the essay “On Typology” written by Rafael Moneo: Firstly, as a researcher, when we read the entire complex content, including the text and drawings, we need to filter and extract the pertinent and valuable contents for our research, to build a foundation of knowledge from the chosen books and essays with researchers’ thinking, involving our logic and methods to arrange content. For example, while reading “On Typology”, an excellent reference for the study of architecture typology, it’s essential to excerpt the relevant sentences or paragraphs especially related to the definition of typology, typology in the design process, the difference between type and model,

Fig. 2. Drawing for the stage of research by reading.

etc. After that, a foundation of knowledge from this essay was generated, combined with other pertinent resources such as the essay “On the Typology” by Giulio Carlo Argan, which engaged with diverse perspectives. Diversifying the reading sources is another effective way to nurture originality because, in this way, our thinking is not limited by a single or a few references. With the integration of different materials, with a critical stance, to analyze and compare the content and thinking from them, and in this process, our individual thinking forms. Therefore, in this phase, if our reference material is excessively narrow or if we fail to incorporate our own insights and innovations following the reading, there is a heightened risk, during the later stages of idea generation, of losing originality and inadvertently falling into the scope of plagiarism.

The Stage of Research by Drawing

Imagination consists of the desire for deformation, and the deformation is the image of the desire (Scolari 2012). Architectural imagination is the essence of research by drawing, which is usually expressed through drawings. Drawing draws its value and its quality from the intrinsic potentiality of a critical moment of synthesis and, therefore, of communication and explanation of the ideational proximity; it is also true that this role of intermediary originates from the strength of its belonging to the whole process of architecture construction in prefigurative terms (Florio 2020).
In architectural research, especially in the literature of architecture, drawing is presented as being used in three distinct ways: as a medium for communication (with clients, builders, etc.), as a medium for design (private “play”), and as a medium for analysis (the acquisition of knowledge and understanding) (Unwin 2007). The first way the drawings are used in research is through applicational images, which simplify the content and show the ideal much more straightforwardly to get more accessible communication, such as getting the immediate expression of design concepts, inspiring discussions and feedback, etc. Secondly, drawing plays a significant role in various architectural design processes, offering a range of benefits that contribute to brainstorming and problem-solving, precisely embodied as visualizing design progression, idea generation and conceptualization, improved spatial understanding, problem discovering and solving. The phase uses drawings to strengthen analysis, making the data more visual and readable, mainly for site analysis and contextual studies.
In addition to these three benefits generated from drawing in the research process, drawings can also promote understanding by translating the written descriptions into the drawings. It is a

prevalent method, especially in the stage of creating paintings through scenes depicted in literary works such as drawing creation from *The Classic of Mountains and Seas*, which is one of the oldest mythological literary works in China, and the stage of creating paintings through the description of historical events and characters such as *The Night Watch* from the artist Rembrandt van Rijn. In this way, it is more apparent and more accessible for people to know the concept of design or research from drawings, especially people who are not in the architecture field and are unfamiliar with architecture. Moreover, when we create the drawings in this way, the drawings entirely have originality because they come from an abstract text description; before forming into the drawings, they went through the painter's subjective thinking and creation, integrating their own interpretation and ideas in it.

The nurturing of originality in the "research by drawing" stage encompasses various drawing types, with particular emphasis on two frequently utilized categories. Distinguishing between these types involves understanding their distinct methods of creation and subsequent applications. The first category is concept drawings, which constantly form in the initial phase of conceiving design or research processes. "The sketch, more than any other drawing, is able to speak instantly with a single logic, because through its paths the hand imitates the idea with voluntary omissions" (Scolari 2012). Many architects are fond of drawing simple sketches before beginning the project, such as Coop Himmelb(l)au, not only because it can visualize and materialize their concepts but also because it makes it possible to capture the fleeting inspiration in mind in a very short time. If the thinking is totally created from the painter's mind, the drawings have total originality without doubt. In

other cases, if the drawings form with other references, the proportion of the independent view and the reference content decides the level of their originality, whether they are inspired by others or plagiarized.

The second, more commonplace type crucial in architectural projects is technical drawing. These drawings encompass plans, elevations, facades, details, and more, ensuring the design's feasibility and the structure's safety during construction. Technical drawings play a significant role in realizing the architect's vision. Besides, this graphic representation is the language that allows engineers and architects to communicate ideas that would be very difficult to explain with words (López-Chao 2020). The originality of technical drawings is intricately tied to the design they illustrate, encompassing the chosen materials and construction methods. Consequently, the originality of technical

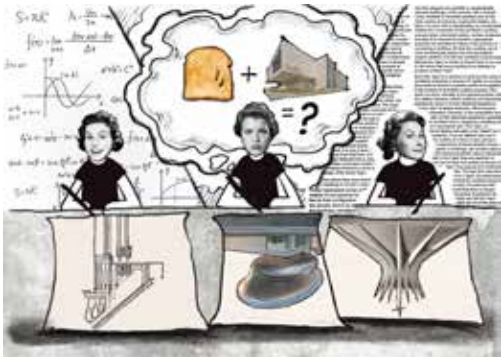

Fig. 3. Drawing for the stage of research by drawing.

drawings is directly linked to the uniqueness of the underlying design.

The Stage of Research by Writing

In the research on the writing process, the storytelling method proves highly effective in captivating readers, articulating findings, and, notably, elucidating intricate ideas. This approach not only fosters reader engagement but also allows researchers to express content and thoughts with enhanced clarity and logical coherence. By integrating storytelling, the research gains a distinct uniqueness and originality, safeguarding it against the risk of plagiarism. This method transforms the research narrative into a compelling and authentic exploration, enriching the overall quality of both the content and its outcomes.

The writing and storytelling methods share some similarities in terms of logic, sequence, and structure. The initial phase of this parallel involves setting the theme to introduce the main idea of the article. This marks the juncture where the researcher grapples with the challenge of organizing a central question within the intricacies of a complex subject matter. Subsequently, as the narrative unfolds, there is a need to establish a hierarchical structure for the research, which focuses on arranging chapters and dividing the different content into different steps or sections, forming a cohesive and comprehensive exploration of the research. To place chapters in this phase, researchers can first list all objects, steps, and keywords, then pick out the required parts and integrate them with a certain logic. After setting the chapters, we write specific content for each chapter; in this period, we need to concentrate on consistency, clear objectives, and logical organization.

It is prevalent to use the storytelling method to illustrate the architectural project, especially in a place with a long

and abundant history or where places have experienced war and been severely devastated. For example, the architectural project “The Museum Building” was designed by Bernard Tschumi, located in the historic area of Athens, Greece.
In many websites and literature records, the writing of this project, which illustrates both its research and design aspects, uses the storytelling method, which has a significant effect. The project uses chronological order to narrate, starting from the description of the historical background of the museum, which shows that the Acropolis of Athens has been destroyed many times during some historical events. Then, the previous museum needs to be built because the number of antiquities unearthed from archaeological excavations is increasing dramatically, which requires a museum to store and protect them. The demand for this museum is because of the need to move outdoor artifacts indoors for better protection and the lack of storage space in the original museum, where the museum designed by Tschumi was born. After that, the narrative comes to the process and the concept of this museum. “Designed with spare horizontal lines and utmost simplicity, the museum is deliberately non-monumental, focusing the visitor's attention on extraordinary works of art. With the greatest possible clarity, the design translates programmatic requirements into architecture.”[1]
Finally, the narration turns to the details of this design. Therefore, narration using the storytelling method is more beneficial for illustrating the author's point of view, attracting the reader, and guiding them to read further. Moreover, it is clear and easy to understand the author ideas and intentions, which could prove the author’s

1. ArchDaily. “New Acropolis Museum / Bernard Tschumi Architects”. 27 May 2010. ArchDaily. Accessed 15 Feb 2024. https://www.archdaily.com/61898/new-acropolis-museum-bernard-tschumi-architects.

Fig. 4. Drawing for the stage of research by writing

originality.

The Stage of Research by Comparison

Comparison is an indispensable technique throughout the research process, intricately linked with the reading, drawing, and writing phases. The notion that architectural design and research should not always strive to create new types or fields is underscored. Often, the emphasis lies in analyzing and comparing a multitude of comparable existing research results and architectural design practices. Researchers and designers systematically generate and optimize their own research and design by comprehending different projects similarities, differences, merits, and shortcomings. This is particularly evident in architectural typology research, where the core methodology involves the comparative study of multiple similar types or forms of elements in the same time and space, demanding analogy and

induction for understanding.
This essay uses examples to illustrate that the ensuing paragraph engages in research by undertaking a comparative analysis of three prominent museums. These institutions share masonry as the primary material for their building envelopes and are situated in distinct temporal and regional contexts.
The first example is the “Kolumba Museum”, a creation of Peter Zumthor that was completed in 2007. The design approach consolidates existing fragments into one cohesive structure, seamlessly integrating with the ruins. “The warm grey brick of the massive building unites with the tuffs, basalt, and bricks of the ruins”,[2] showcasing an organic connection with the existing structures. The organic integration with the existing ruins, the perfect integration with the surrounding site, the texture and color of new and old building materials and the charming indoor light and shadow effects. The architects made these local-specific designs based on full respect for the site and presence, which together resulted in this outstanding building. The second museum under scrutiny is the “Ningbo History Museum”, designed by Wang Shu and erected in 2008. Wang Shu’s vision is to preserve memories of demolished villages by using materials recycled from the site. It can be seen that recycling materials from demolished buildings on the site present the design of this building. From this point of view, this approach also preserves the original “ruins” on the site. There are similarities with the Kolumba Museum. However, in terms of design essence, this building is a large-scale public building newly built on a blank site. The facade design and interior material selection could be more complex

2. Divisare. “Peter Zumthor Kolumba Museum”. Divisare. 24 Jul. 2017. Accessed 15 Feb 2024. https://divisare.com/projects/349228-peter-zumthor-rasmus-hjortshoj-kolumba-museum

and diverse. This is different from the former. The third case is the “Kadokawa Culture Museum”, crafted by Kengo Kuma in 2020. Kuma aimed to recreate a more distant memory - the moment when the Musashino Plateau was formed by the squeeze of the tectonic plate. To some extent, this project shares some similarities, such as the concept of the previous two projects, but the irony is that the granite used in this building to preserve the Japanese culture comes from China instead of local Japanese materials. At the same time, this building gives people an intuitive sense of the uniqueness and weirdness of the building itself and does not give people the feeling of integrating into the surrounding site. These examples reveal that although these three buildings are similar in materials, colors and functions, the most significant differences are the site, architecture, the coordination and unity of indoor and outdoor materials and indoor effects, and

Fig. 5. Drawing for the stage of research by comparison.

the implementation of the architectural concept. These examples reveal that although these three buildings are similar in materials, colors, and functions, the most significant differences are in the site, architecture, the coordination and unity of indoor and outdoor materials and indoor effects, and the implementation of the architectural concept. These are the characteristics that good original works should have. As Peter Eisenman stated, “Imitation must be practiced in the absence of the original”. We need to fully learn the essence of the reference project we admire so as to realize our own creation and show our own ideas to realize the originality, rather than directly and bluntly using elements that have not been “digested” personally.

Conclusion

Architecture has been at the center of discussions on “originality” with the abundance and distribution of knowledge.[3] Overall, the stages of design-based, reading, drawing, writing, and comparison are not merely procedural steps in architectural research but transformative methods to shape original and innovative thinking. The pivotal role of each stage in fostering creation and guarding against plagiarism is evident. The essence of these phases lies in interpreting, synthesizing, and inventing rather than repeating and copying. The originality is a fundamental criterion and persistent pursuit.

3. Söhmen Tunay and Uz, “Deconstructing ‘Original-Copy’ in Architectural Manifestos from 20th Century to Present”.

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