AR3A160 Lecture Series Research Methods – FINAL ASSIGNMENT
Self-Assessment on Research Methods

Marija Jasine | 4829751

Chair of Architectural Engineering | One Million Homes Studio

Investigating Housing | Putting both users and materials in focus

I INTRODUCTION

Research methodology is the study of a process, how disciplines set their steps to study sources in order to establish facts[1]. By applying a research methodology to an architectural research, we become aware of the process and the steps which structures our work and gives it direction as the applied heuristics regulate the position. By that, the methodology also sculpts the architectural question on which the process of research is founded [2]. Research methodology provides us with the understanding of the methods with their potentials and limitations, which informs a selection of methods. It helps us take an educated choice knowing what we are leaving aside and what challenges we would be facing. This would usually lead to the choice of several adequate methods forming interesting and unique intersections that would enrich our research and lead us to answers that represent an original contribution to knowledge. In architecture specifically, the potential of this contribution lies in its originality, its ability to move on the established rather than replicating conventional knowledge [3]. Moreover, the understanding of the different processes governing our architectural research leads us to a deeper understanding of architecture as a discipline that operates with and in external conditions: it is facilitated by external factors, but it also brings selectively some of these factors in. This intellectual construct of the research, and the quasi-autonomy of its selective incorporation of externalities, can bring intellect and design and art to bear on societal conditions[4].

It can also bring architectural design one step closer to the audience. Placing our research within an intellectual context and thus being able to discuss the methodological challenges that we faced while being honest about the limitations of the methods helps us clearly explain the process to the reader. Pointing out the established techniques that were applied in our research helps in making something subjective objective, thus making our design accessible to the audience.

Through the lectures and readings, I gained insight to these techniques and to examples of their applications, which shed the light on the multiplicity of our field. What interested me most in these examples is their accessibility and the ability of relating these applications to my own topic. The lectures always triggered an intellectual process questioning what could be applied to my project and in what way, and how does that relate to me as an architect. This opened my eyes to the fact that my project could be tackled from almost all the presented points of view. In each lecture, I could already imagine the outcome of my work have I followed the presented methods. That led to a deeper understanding of my aim and to the fine-tuning of my design question to follow the chosen intersection of methods. This process also made me aware of my own beliefs and motives, beyond the intuition. Structuring and understanding my choices helped in refining my intuitive decisions and gave it the needed objectivity to be explained to others.

To understand that better, it is important to explain the project, design question, and the context. As part of the Architectural Engineering studio, my graduation project is carried out under the theme of "1 Million Homes". The 1 Million Homes group is mainly concerned with increasing housing demand and finding smart and sustainable solutions for this issue. I took a conscience decision to join this group as I consider it a merging of two often conflicting topics, the intimate field of housing/dwelling and the distanced field of engineering/mass production. Thus, in my master's thesis I would attempt to answer my design question: "How to design technologically advanced affordable single occupant housing for young people using the left-over space in city centers?" This poses the following research-methodological question: “How to research this subject from a lens that merges the aforementioned topics?”

II RESEARCH-METHODOLOGICAL DISCUSSION

I have previously dealt with the subject of housing in my bachelor's thesis where I investigated the difference between the 2 notions of house and home. In my research then, I relied on phenomenology to capture this distinction where I concluded that the home is the emotional entity expressed by our rituals that happen to be exercised in a physical entity, the house. Yet, these rituals could potentially take place anywhere where we feel to belong. Responding to the outcomes of my research, my proposal was a conceptual project where new stories of experiencing a house created new relationships between the different house “members”, be it its elements or inhabitants.

In my master's thesis I wanted to build on my previous study, yet my aim was a feasible design that is ready to be built. I think it is important here to reflect on the internal/external factors that influenced this decision: the desire to detach from the mere conceptual, own curiosity and desire to learn about innovative technologies, various resources and expertise available at TU Delft, the actual need for housing, the chosen studio's approach. My goal was in line with the focus of the 1 Million Homes studio that is mainly on solving the housing issue through designing smart fabrication techniques and efficient assembly using sustainable materials to ensure the affordability of these houses. Yet, locating such houses in the center of a crowded city is nearly impossible as the prices of the land are so high that even the cheaply constructed house would be barely affordable. But what if these houses could exist without acquiring land? If we look closer to the dense city centers, we could see that some space is still available, such as unused rooftops, blind walls, or even gaps between buildings. What if these designed houses could somehow attach to the existing fabric and engage with the neighborhood? The small scale of an optimized single occupant house gave it the potential to do so. It also made it less abstract providing it with the required tangibility.

It was important for me to take advantage of this tangibility to conduct a research the outcome of which brings the project a step closer to people. I think that for a project to be successful/feasible it should highly relate to people, as audience, clients, and future users. It should also be able to easily explain and clearly state its aim supporting it with research responding to urgent issues and people's needs through objective data, innovations, and facts. To achieve that, the research should be conducted under the frameworks of relevant methodologies. As mentioned in the LSRM lecture by Berkers, "by studying the praxis of architecture one develops an eye for the actual users of the building, and not the imagined ones"[1]. While materials, are a more universal topic which makes material studies easier to translate to audience/clients than theoretical approaches[2]. Combining these methodologies allowed me to conduct my work as an interdisciplinary research that draws relevant knowledge from both the social and applied sciences disciplines employing a combination of quantitative and qualitative methods. That being said, my work followed a context led research, in which, according to Lucas, the context becomes the driving force of the research. In this case, the context of my research was the lack of housing in European cities[3].

It is also useful to be aware of where I place myself in my own research. The topic of my thesis, its location, and the target group offer the opportunity of introducing the emic approach. The project started from a concern with an issue that I personally suffered from, the availability and affordability of student housing. My first study site for my project is Delft and my proposed potential sites are other student cities in Europe which are culturally similar. The target group is students and young professionals, to which I belong. In a way, that makes me a person within the investigated culture of people living alone in major cities. In this context I have used various research methods, from own observations of the current housing situation, informal discussions with my friends about their expectations and space usage in their houses and neighborhoods, to studying previously conducted surveys on co-housing. Data gathering also included surveys and sketches of site situations, and photographs of left-over spaces taken by me and friends of mine who live in crowded student cities.

Yet, my aim is to create a guideline for designing these houses in several major cities. Introducing a more generalized approach that can be applied across different cultures seems to be indispensable for that purpose. Through my research I have been also following a more scientific approach giving preference or emphasizing what I consider to be important. I have detached myself from the issue to some extend to be able to give a description of the situation as an external observer, by that following the etic approach. Here, I referred to official statistics published by the EU to define major target cities with different housing problems. These statistics also proved my assumptions of the shortage of single occupant housing, the recent increase in its demand, and the fact that my chosen target group is the one suffering most from this issue. In addition to that, literature review and case studies of relevant projects were done. To get familiar with various building laws and restrictions I referred to official municipal documents. On the other hand, material properties, their biography and innovative usage were studied through scientific publications, research, and expertise consults. With this information I was able to construct the outline for my design guideline. It could be said that, in my

research the emic knowledge played a valuable role as an insight for the development of the etic premises.

III RESEARCH-METHODOLOGICAL REFLECTION

It is important to establish a critical understanding of the potentials and limitations of the chosen epistemic frameworks, praxeology and material culture. As their relevance to the topic and my aim was previously presented, here I would like to focus on how these methodological apparatuses have evolved, highlighting thereby the significant challenges.

"Praxeology rests on the fundamental axiom that individual human beings act, that is, on the primordial fact that individuals engage in conscious actions toward chosen goals." While it is now outdated in the world of economics where it was previously a distinctive methodology of the Austrian school, it is still a valid framework for architectural research. As introduced in the lectures, praxeology in architecture is the study of the way people use the built environment as a stage of everyday practice. It can be thus seen as a lens through which spatial and social practices are investigated. It is important to differentiate it from other methodologies often used in architectural research, namely environmental psychology and ethnography. The former studies how the built environment affects human behavior, the latter is first and foremost about people in their cultural settings[1]. Praxeology, on the other hand, studies the people's actual actions in the built environment regardless of the reasons.

During the lecture, early applications of praxeology in the architectural field were mentioned. Bruno Taut's Die neue Wohnung, published in 1924, is a book about the house from a perspective of a woman. The book presents insightful sketches where the movements of people are marked on plans, providing a method of studying the usage of the space to maximize its efficiency. In 1926, based on similar studies to rationalize the different tasks carried out in kitchens, Margarete Schütte-Lihotzky designed the Frankfurt kitchen as an optimized version for German apartments. The design was inspired by the space-constrained train kitchens and influenced by the ideas of Taylorism that investigated more efficient ways of production and improving the assembly line. The influence of Taylorism and Fordism were also evident in the work of Le Corbusier as his architectural and urban design processes were complex yet efficient. This was vital for the mass production of architecture proposed by many projects at CIAM to which Le Corbusier largely contributed. The CIAM grid system, launched in 1949, and many of the projects that fall under it, are main examples of applying praxeology in the modernist period. In 1953, the topic of CIAM 9 was the study of nature of human habitation, during which a research on bidonvilles of Algeria and Morocco was presented[2].

The architects presented a comprehensive study of the two bidonvilles analyzing their everyday living conditions and highlighting them as fabrics of social practices rather than modern urban projects. In another grid, entitled Urban Reidentification by Alison and Peter Smithson, the architects similarly presented an analysis of Bethnal Green, a working-class neighborhood in London. Introducing the built environment through the lens of social practice triggered a radical shift in CIAM's concept of dwelling [3].

In recent years, praxeology in architecture continued to evolve remarkably. As it still relies on major methods such as historical analysis, drawing, observations, and interviews, some of these methods have morphed. New technologies have been introduced to the data gathering methods such as various recording techniques and computer simulations. Also, significant attention is now given to focus groups and user participation to increase the collaboration between people and the design team especially in the field of co-housing. Some architects have engaged in participatory and co-design projects where the future residents have a major say on the architectural outcomes through organized discussions. Even though this gives the users a break from housing being a money-based sector and puts them back in focus where they can clearly state what their desires, while helping architects in their research, this method has its risks. In addition to requisitioning the role of the architect as an expert in this process, it restricts knowledge and limits innovation. If not enhanced by other means of investigation, architects' research would be restricted to the users' input which does not offer a complete understanding of human dwelling. Moreover, as architects, we are knowledgeable about various disciplines, introduced to technological advancements, and taught do be visionary; that triggers our creativity which we dare to pursue. A lot of our ideas are intuitive, these are subconsciously based on

our acquired knowledge, however they are not yet tangible at the concept phases. Translating our innovative preliminary ideas to the participants becomes not an easy task, which could complicate and slow down the creative process. This could also form a gap between architects and the users who do not always share our vision, or simply cannot imagine it yet. Here, introducing research on material culture, which is a more tangible topic, could help reduce this gap.

In his book Lucas defines material culture studies as "a branch of anthropology and archaeology concerned with the biographies of things – the objects, clothing and materials we come into contact with every day." As we have been informed during the lecture by Schreurs, material culture borrows research methods from other disciplines. From archeology, material culture studies adapt field work, analytical drawing (looking at the object and drawing 1 or 2 of its characteristics), 100 days method (looking at the object and discussing it on different days), and seriation (sequence development). Through these methods, material culture contributes to our understanding of the role of these "things" to men in their everyday lives thus offering ways into the social nature of things. In his book, Lucas reviews some examples in these field shedding the light on how it evolved, where material biography gained more importance over time. Researchers started to look at materials not as inert but rather as changing and related to other materials. That is by studying their procurement, manufacturing, use, maintenance and repair, and discard [1].

Through these examples Lucas mentions some of the limitations in material culture, the limitations here are mainly that the process of making the objects are generally ignored. How the man modified the material is overlooked, and it shouldn't be, as it is where the innovation lies. Moreover, looking at the material and its properties and potentials helps us understand this process better. Yet, that is also often neglected. In this context, a critique is given by Ingold: "The ever-growing literature in anthropology and archaeology that deals explicitly with the subjects of materiality and material culture seems to have hardly anything to say about materials"[1], this realization leads to more focus on the biography of materials, especially the stage of production. As mentioned in the lectures, some relevant research methods have been already incorporated such as research through making, which is common in art history (how was paint made to make the painting). Other methods are more recent, such as ordering and comparing, similar to what is done at the ETH material library in Zurich. Simulations through various programs have also advanced in the past few years.

These methods lead to a deeper understanding of the material itself, how it could morph, and how it relates to other materials/objects, which in turn fosters creativity leading to innovations.

IV POSITIONING

Understanding the chosen frameworks helped me rationalize the process and steps takes so far. In my research I see the 2 methodologies to balance and complete one another. Being aware that reaching adequate results through some praxeology methods is a time-consuming process, such as that with direct observation, and taking into consideration the time restrictions of the MSc project, I have chosen to alter this process. This also relates to the fact that my context is not a given place, but a set of cities with specific criteria. Being so, direct observation of a specific site would not have been comprehensive. I have chosen to study literature, specifically that written from the 1st perspective, where people describe their houses and how they dwell in them. Little House on a Small Planet, by Salomon, was one of these books in which people from various life situations reflect on how they use their small house. I believe this exercise gives valuable insights to dwelling from several perspectives. Another example is "Mroiyama-San", a movie directed by Bêka and Lemoine. It documents a week spent at SANAA's Moriyama House, following the daily life of its inhabitants. Other methods such as informal interviews with friends and collogues, who represented the target group of my project, were used for a better understanding of the future inhabitants of my design. Their desires, needs, unique dwelling patterns, movements in space, and the duration of usage of facilities, were studied through surveys and their own sketches. These helped me formulate a system in which the spaces are referenced with their importance, duration, and time of usage. Common patterns were deduced which allowed me to take decisions regarding the dimensions of spaces and circulation in them, to create compact yet efficient and practical houses that are constrained by the minimal left-over space. I did not wish to push the

praxeological studies further to introduce participatory design, as I believe that an architect should be in charge with a conscience and responsible view for the project. By conducting comprehensive research, taking the desires and needs of users through studies structured by the architect, he/she can put the users in focus without hindering his/her own creative process. To push this creative process a step further, bringing it to the more tangible realm, the material culture framework acted as a backbone for my future design. From this methodology, I have decided to focus on the often-overlooked study of the materials themselves. As Frampton states: “Good architecture starts always with efficient construction. Without construction there is no architecture. Construction embodies material and its use according to its properties.”

Adopting some methods from material culture, literature and case studies gave me insights on the potentials and limitations of various materials, possibilities of smart fabrication, and off-site construction. For the purpose of my research the focus was on lightweight materials. Understanding their properties allowed ordering and comparing these materials which also helped in making decisions regarding their applications. In addition, their relationship to other materials became clearer as I could understand which materials could enhance one another based on their properties and previous applications. As some of the lightweight materials are recently or not yet in use in the architectural field, not enough references could be found. For that, I applied research through making to innovative case studies as well as some widely used but rarely studied structural elements, which helped me understand the potentials of some materials and thus create an overview of what can be used for the purpose of my project, i.e to attach the designed houses to existing buildings. By observation and literature, it was important to study the existing fabric as well, its structural elements, and their strength, to know the maximum loads these buildings could handle.

Of course, considering the subject of the project, as housing is a broad topic open to various discussions in the architectural field, it is possible to tackle it from various lenses. Understanding the implications of each vs. one’s goals becomes vital from the early stages of research. My curiosity to learn about technological advances for construction lead me to a small-scale project that is more tangible. On such a scale materials’ understanding is crucial and good details are key. This fact has pushed me away from basing my research on typological studies. As this methodology mainly focuses on how types of spaces evolved through history and how they were used throughout, in the subject of housing these studies investigate the relation of the different spaces of the house to each other. Considering the scale of the project, being a single occupant house that should fit in left-over gaps in crowded cities, the study of such relationships becomes obsolete. It becomes more relevant to study the way people use space through praxeology as it provides information about their dwelling which is more related to the functions of the house regardless of the relation of the spaces to one another. This could then be applied to my project where the houses to be spread out in a neighborhood, thus redefining it. I envision them to be small private units each in a “gap” yet sharing some public amenities in the same neighborhood, such as working places for example. The house is then extended in the neighborhood and dwelling is not confined to one physical unit. For that, I consider that studying the actual actions of people becomes more relevant than studying the relation of spaces as seen through these actions. This is not to disregard typological studies, of course during research frameworks overlap and there is a necessity to understand some typologies to be able to decipher people’s actions for example. Yet it is not the main lens in my approach, but it is seen as part of the praxeological studies.

As for phenomenology, it is certainly applicable to small-scale tangible designs, but it had previously led me to more theoretical outcomes in my bachelors studies which are hard to translate to audience. Of course these studies would lead to tangible designs when layered with other research. That is what I intend to do im my current work as I take my outcomes of the bachelors study as given and build a feasible project on them. I consider that to be inline with the focus of my studio on real time issue of housing.

Furthermore, the structure of my chosen graduation studio and the supportive elective of the aE research paper, provided me with a suitable and nonlinear process where design and research inform one another as they are carried out simultaneously. It was an opportunity for me to explore the 2 different topics simultaneously. Taking advantage of that, I have chosen my research paper to mainly focus on

fabrication and construction techniques relevant to a selection of materials, while the design studies to deal with the social and political aspects. As both go together, design is grounded by research while research gains focus from design. It was a continuously revised process rather than a simple progression, where the 2 parallel activities were constantly revisited, altered, and refined.

To conclude I believe that in this chosen intersection of praxeology and material culture I gain an understanding of the users and introduce technological innovations. Proposing a new way of dwelling to solve a real time issue I see my project with later potential of becoming a research by design which should be provocative in essence to induce change in how we now live.

BIBLIOGRAPHY

Anderson, Stanford. “Rational Reconstructions and Architectural Knowledge,” *In Architecture in the Age of Empire*, edited by Kristian, et al., 163 - 175. Weimar: Verlag der Bauhaus-Universität, 2011.

Baghdadi, Mustafa. "Changing Ideals in Architecture: From CIAM to Team X." In *Architectural Knowledge and Cultural Diversity*, edited by William O'Reilly, 165-167. Lausanne: Comportements, 1999.

De Certeau, Michel. *The practice of everyday life*. Berkeley: University of California Press, 1988.

Frampton, Kenneth, and John Cava. *Studies in tectonic culture: the poetics of construction in nineteenth and twentieth century architecture*. Cambridge, Massachusetts: MIT Press, 1995.

Groat, Linda N., and David Wang. *Architectural research methods*. New York: J. Wiley, 2002.

Ingold, Tim. “Materials against Materiality.” *Archaeological Dialogues* 14, no. 1, 1-16. United Kingdom: Cambridge University Press, 2007.

Landau, Royston. “Notes on the concept of an architectural position.” *In AA Files*, no. 1, 111-114. London: Architectural Association School of Architecture, winter 1981-82

Lucas, Ray. *Research methods for architecture*. London: Laurence King Publishing, 2016.

Mumford, Eric Paul. *The CIAM Discourse on Urbanism, 1928-1960*. Cambridge, Massachusetts: MIT Press, 2000.

Murray N., Rothbard. “Praxeology: The Methodology of Austrian Economics.” In *The Foundations of Modern Austrian Economics*, edited by Edwin Dolan, 19-39. Kansas City: Sheed and Ward, 1976.

Patteeuw, Véronique, and Léa-Catherine Szacka. *Mediated Messages: periodicals, exhibitions and the shaping of postmodern architecture*. London, New York: Bloomsbury Visual Arts, Bloomsbury Publishing Plc, 2018.

Sattrup, Peter Andreas. *Architectural Research Paradigms: an overview and a research example*. 2012

Tilley, Christopher, Webb Keane, Susanne Küchler, Michael Rowlands and Patricia Spyer *Handbook of Material Culture*. London: SAGE Publications Ltd, 2006.