Navigating challenges and opportunities in contemporary architectural education: a case study of remote design studio dynamics

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ABSTRACT: In response to the multifaceted challenges of contemporary design contexts, this article delves into the initial stage of the design process within architectural education. With a focus on integrating technology and addressing the challenges posed by image abundance, it presents a methodological framework developed through an international student design workshop. This framework seeks to reconcile traditional design principles with the opportunities and complexities of the digital age, equipping students with the skills and tools needed to navigate today's design landscape effectively. By fostering interdisciplinary collaboration and critical thinking, the proposed approach aims to empower students to address the social, cultural, economic and environmental dimensions of architectural design in a holistic manner. Through the case study and practical insights, this article offers valuable perspectives on reimagining architectural design education for the challenges of the 21st century.

INTRODUCTION

The contemporary world has become more multifaceted and complicated than ever before. Worldwide, people are experiencing uncertainty and insecurity on both global and local scales. Broad and immediate access to information strengthens, exposing even more the threat of climate change, demographic crises, and unequal access to goods and services. As architectural education continues to adapt to the demands of the digital age, the integration of contemporary technology presents both opportunities and challenges.

Rapid advancements in digital tools, computational design software and virtual reality platforms have revolutionised the architectural design process, offering students unprecedented capabilities for visualisation, simulation and experimentation. However, navigating this technological landscape requires architectural educators to strike a delicate balance between embracing innovation and preserving fundamental principles of design, craftsmanship and critical thinking. Moreover, the accessibility and affordability of digital technologies vary widely, posing equity concerns within educational settings. Thus, architectural pedagogy must evolve to effectively harness the potential of contemporary technology, while fostering a holistic understanding of architecture that encompasses both digital and analogue methodologies.

Complexity, ambiguity and design contexts today require particular emphasis on the quality of the project's initial phase and the factors determining it. The article focuses on the initial stage of the design process in the architectural education studio and on the influence of technology, specifically as it manifests through the overabundance of images and their use. It proposes a methodological framework elaborated and tested during an international student design workshop.

THE BEGINNING PHASE OF THE DESIGN STUDIO

While a great deal of attention has been directed toward such issues as problem solving and problem relevance, questions concerning how to begin a design studio and what is unique about the beginning phase in the studio remain rather neglected. Definitions of the problem-solving process should also be considered at the beginning. Problem solving has been the subject of comprehensive research, and its structure and phases have been widely discussed and elaborated. The first and early stage is referred to as *problem structuring* or the *analysis phase* [1]. Many studio researchers use creative and innovative approaches to design studio teaching. The beginning is often well thought out and planned, but this does not mean it is specifically treated as a unique situation requiring attention. It cannot be said that the significance of the beginning has gone unnoticed. Indeed, the following statement by a typically enthusiastic studio instructor demonstrates just the opposite: …*Our crazy laughter on the first day is one of the most important moments of the project* [2]. In general, the tendency has been to assess procedures in the beginning phase based on their relationship to the rest of the process or on their merit with respect to the solution.

The beginning in a design studio, or any given situation, is unique. Several issues that differentiate it from the rest of the semester arise during this period. Among these are psychological issues of human interaction, as this is the first meeting between instructor and students, and sometimes among classmates. The class dynamics, the varying ways people react to prior information, and the time frame in which people evaluate new situations and categorise information and other people are all compacted into a relatively short period of time. The dynamics and rhythm of further meetings are generally set at the beginning. This is a tense period marked by anxiety and insecurity that can have a considerable impact on the value of what is to come. This period and the above-mentioned conditions can have both negative and positive potential. In either case, educators contend that this period should be defined and understood, and its importance should be acknowledged to exploit all the advantages of the design studio [3].

People tend to be biased toward preliminary knowledge, and consequently assign more significance to earlier acquired information while using later information to confirm what they already know. This is even more so among designers, who tend to jump ahead to possible solutions before receiving full knowledge of the problem. People create first impressions and use later information in a biased way to reinforce it. They tend to explain reality to confirm their initial impressions, even to the point of contradiction [4]. This is also indicated in a study by Rabin and Schrag:

> *Psychological research indicates that people have a cognitive bias that leads them to misinterpret new information as supporting previously held hypotheses...* [People] *may come to believe with near certainty in a false hypothesis despite receiving an infinite amount of information* [5].

The design process for *real-life* professionals has its own time span, and one can assume that professional designers are focused primarily on the problem solution. In the educational environment, students are locked into a specific time frame to complete the design process. Furthermore, they are concerned with going through the process and learning and experiencing it, perhaps for the first time. Hence, the psychological and content aspects of the beginning phase are important to everything that occurs subsequently during the semester. The beginning phase also involves presenting a design problem as an exercise, a project, an issue or a research parameter. The authors discuss issues of importance in the beginning phase, relevant throughout the studio but having unique or magnified importance at the beginning:

a) Problem definition
b) Problem structuring
c) Creativity

Problem Definition

Design problems are problematic in their formulation and their meaning. This is even more the case in the educational format of the design studio [6]. Hence, the issue of how a problem should be stated or what problem should be defined in the design studio becomes very important. This is well put by Cross in the following quote:

> *It is also now widely recognized that design problems are ill-defined, ill-structured, or* wicked … *They are not problems for which all the necessary information is, or ever can be, available to the problem-solver. They are therefore not susceptible to exhaustive analysis, and there can never be a guarantee that* correct *solutions can be found for them* [7].

According to research in the field of design problem solving, the state of uncertainty with respect to problems and their definitions relates to the fact that designers must learn to live with those problems/definitions and even thrive under. Some researchers go so far as to claim that designers, both students and professionals, prefer uncertainty and even create it in situations where it does not exist. Hence, conditions of uncertainty should be taught, and the response to such situations is a skill that should be acquired in design schools. Further, some researchers claim that the ability to overcome the stagnation caused by uncertainty is essential to ensure good designers and an efficient design process.

Problem Structuring

Research concerning issues of problem solving defines and stresses the importance of the beginning phase. This is the phase during which the problem is structured. Given the nature of design problems and the unique dialogue when initially considering such problems, it becomes essential to pay attention to the time frame. The relationship between problem and solution is not a logical one. The incomplete and changing information about the problem and its nature is such that research has defined the early stages of problem analysis as *structuring*. This term indicates that not only is the problem evaluated and considered in linear and logical terms, but it also gets reshaped in the mind of an active designer and is structured and restructured until a solution is formulated. Some researchers claim that a solution can be formed prior to problem structuring, simultaneous with it or *via* a fluctuating process. Structuring shortens the essence of the creative process, a mysterious bridging process that transforms a design from an *ill-defined* problem into a potential solution-ready condition. This ambiguous process has been demystified by several resolute researchers, such as Dorst and Cross who suggested that:

> *…the creative event in design is not so much a* creative leap *from problem to solution as the building of a* bridge *between the problem space and the solution space by the identification of a key concept.*

> *Our observations confirm that creative design involves a period of exploration in which problem and solution spaces are evolving and are unstable until (temporarily) fixed by an emergent bridge which identifies a problem solution pairing* [8].

Creativity

The aim of design education or at least one of its main goals, is to teach and enhance creativity. The creative teaching process in the design studio is sometimes called *reflection-in-action*, a term coined by Schön to explain the unique way designers are educated [9]. Should it not be essential to begin with a creative way of presenting a problem? The assumption is that students are given a design problem, and creativity emerges automatically. Yet the authors argue that creativity resides not only in the outcome of student work but also in the actions and definitions provided by design educators right from the outset. As Wiley states:

> *Altering the instruments, tools, and the process used during design increases the students' awareness of the influences exerted by their method, and such awareness could further the expression of an idea* [10].

CONTEMPORARY CHALLENGES FOR ARCHITECTURAL EDUCATION

In the ever-evolving landscape of architecture and architectural education, contemporary challenges loom large. From the integration of cutting-edge technologies to the adaptation to remote access and virtual information dissemination, architects and educators are confronted with a rapidly changing terrain. Moreover, the proliferation of images and their utilisation in design processes, coupled with the forces of globalisation, add further complexity to this dynamic milieu. Yet amidst these contemporary upheavals, age-old issues persist, serving as enduring touchstones that anchor architectural discourse. Concepts such as personal expression, the cultivation of sensibilities and the pursuit of open-ended representation continue to resonate deeply within the fabric of architectural theory and practice [11].

Tendencies of flatness and complexity mark the reality of society and culture in the 21st century. The rapid advances in technology and globalisation augment these conflicting phenomena. As is marked by several researchers of contemporary architectural education, this cultural reality is very much delivered and understood via the image, the visual rather than the haptic. The influence and meaning of this process on architecture and architectural education are vital for contemporary culture and society, and are at the core of current research [12].

OVERABUNDANCE OF IMAGES

In the present-day digital age, people find ourselves inundated with a deluge of images, saturating their screens and the subconscious part of the mind with a relentless stream of visual stimuli. This over-abundance of imagery has permeated every facet of contemporary culture, from social media platforms to advertising campaigns. In the realm of architecture and architectural education, this proliferation of images presents both opportunities and challenges.

On the one hand, access to a vast repository of visual references has facilitated the exploration of design possibilities and enabled architects to draw inspiration from a diverse array of sources. However, amidst this sea of images, the space diminishes to panoramic and kaleidoscopic images, posing the danger of superficiality and homogeneity, where originality and critical thinking risk being overshadowed by the allure of aesthetic trends. Moreover, the reliance on images as primary modes of communication in architectural discourse raises questions about the efficacy of traditional pedagogical methods and the need to cultivate a more discerning visual literacy among students. Thus, the omnipresence of images in contemporary culture underscores the pressing need for architects and educators alike to navigate this visual landscape with a keen awareness of its implications on the practice and teaching of architecture [13].

American philosopher, activist and filmmaker Susan Sontag published a collection of essays titled *On Photography* in 1977. In it, she argues that the proliferation of photographic images had begun a new level of meanings and events and established within people a *chronic voyeuristic relation* to the world. Sontag claims that the individual who seeks to record cannot intervene and that the person who intervenes cannot faithfully record, for the two aims contradict each other [14].

French semiotic philosopher Jean Baudrillard is best known for analysing media, contemporary culture and technological communication. In his *Simulacra and Simulation*, published in 1981, he explains that *simulacra* is a copy that depicts things that either had no original or no longer have an original. *Simulation* is the imitation of the operation of a real-world process or system over time. In the text, Baudrillard examines the relationships between reality, symbols and society, particularly the significations and symbolism of culture and media [15]. Vision, gaze, image, their role in contemporary society and possible consequences have gained much critical attention, for example, this notion by British architect and theorist Neil Leach:

> *A society awash with images will experience a consequent reduction in social and political sensibilities, as the intoxication of the image leads to a lowering of critical awareness; the saturation of the image will, therefore, promote an uncritical acceptance of the image* [16].

French thinker Marc Augé criticises contemporary culture, which he refers to as characterising super modernity by its tendency for excess. This mainly refers to the accelerated flood of events that constantly blasts people, propagated by images. News, entertainment and commercials continually overwhelm people with a perpetual demand for attention. He contends that it diminishes one's ability to interpret, contextualise or comprehend the relationship between related episodes [17].

Finnish architect Juhani Pallasmaa suggests an architecture of the senses, which he refers to in multiple terms as fragile, weak, sensory, and more often as *haptic architecture*. Pallasmaa's criticism is aimed at the over-abundance of images and over-emphasis of the ocular and their dominance in the appreciation of architecture. According to Pallasmaa, haptic architecture means the totality of how the senses participate in the experience of space [18].

In light of the above, it is essential to note that the visual is not merely limited to the content of the seen; it is always about potential, unfolding, possible interpretation, or a hint toward something else that resides elsewhere. There is mental depth in what is seen. Images do not really copy; they are rather obscure and make things lose in their undeniable and concrete manifestation while, in turn, they gain an existence as potential, open to interpretation. The image opens windows toward ideas and feelings that the visible cannot unveil. In turn, the visible is neither passive nor completely objective; it is always dynamic and changing; it creates and establishes while simultaneously consumes and flattens [19].

CASE STUDY: OVERLAPPING THE DISTANT WITH THE ADJACENT

Aims and Assumptions

VirtuSquare, the International Student Design Workshop, took place in Kraków , Poland - on-site, and in Tel-Aviv, Israel - remotely on 09-23 May 2023. Participants were students from Cracow University of Technology, Faculty of Architecture, and Holon Institute of Technology, Faculty of Design. The workshop aimed to approach design as a form of anticipation that does not necessarily reflect a realistic building proposal but rather rejoices in the juxtaposition of the familiar with the remote, the real with the virtual. A further aim of the workshop was to experience the design process with contemporary tools of observation and representation. Tools that aim toward observation, but their role and possibilities in the design process are not yet clear or established.

During the workshops, students faced the challenge of designing in a known and accessible place confronted with a remote place, unknown in the physical and cultural sense. The inspiration with broadly understood elements of space (landmarks, details and materials) was supposed to break the students away from stereotypical thinking and encourage bold and creative formulation of the design problem first and then the design solution. Therefore, the traditional methods of presenting a design solution seemed not optimal; instead, superimposition and collage techniques could have enhanced artistic expression.

Description

The workshop contained the following phases:

1. Remote field trip - the Israeli students guided a remote field trip in two designated areas in Israel, the Clock Square in old Jaffa and the Habima Square in Tel-Aviv. The collecting and observation exercise with remote tools let the Kraków students understand the squares' heritage and contemporary compositional and functional aspects, and notice specific forms, landmarks, materials and details. Video walks commented on by students explained the issues of scale, distances and climate.

2. Self-discovery of the remote city's space - through a carefully planned city exploration, participants were directed toward self-discovery of the remote city's space and fabric using a multitude of remote observation mediums, such as video stream, Google Street View, on-line imagery, etc. They were asked to find, identify and explore unpredicted spaces not defined by regulations, precedents or known signifiers, but by available observation tools and their capacity to anticipate.

3. On-site field trip - the on-site tour aimed to familiarise students with the sites space in Kraków. Two proposed sites, the National Museum Square and the Ronald Regan Square, are large-scale and significant. Both required interventions for improving functionality and aesthetics, and implementing sustainable solutions. Students collected photos and video movies and got familiar with the scale, distances and people fluxes.

4. Design method and process - the design process started with selecting a city square in Kraków and coupling it with a remote square in Israel. Materials collected via *remote exploration* were used to make a set of raw materials for reformulating the squares in Kraków. Students were expected to juxtapose, superimpose, plant, refabricate, alternate, camouflage, transform and mutate the existing Kraków spaces with the *raw material* collected remotely (Figure 1). This reformulation or mutation of the coupled squares allowed the students to explore and envision possible memories and future recollections.

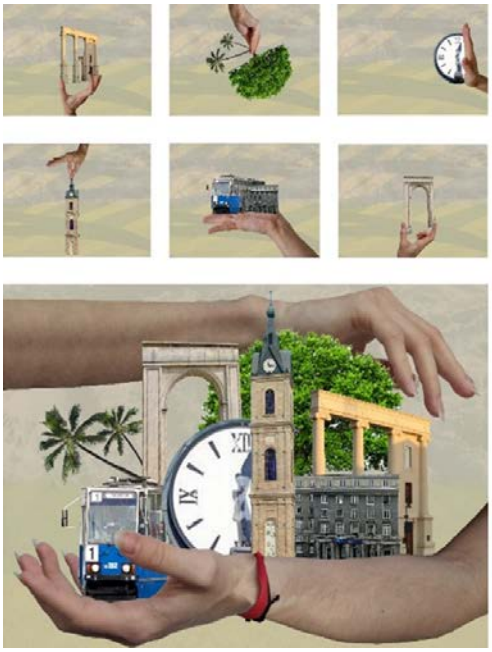

Figure 1: Example of student work - 1.

Figure 2: Example of student work - 2.

Results

The result encompassed seven important frames composing a *story-board* of the student's suggested narrative/proposition; each frame composed from a mixture of the diverse material collected was supposed to be re-arranged in the form of collage, superimposition, juxtaposition, media-mixture, etc, and suggest alternative spatial and symbolic possibilities.

Complementary to pictures was a video sequence, 21 seconds long, to support the same narrative/proposition. Students were encouraged to submit sketches and collected raw materials as supporting evidence. Students' works were presented, discussed, and then analysed by instructors to discover the advantages of the approach proposed during the workshop. The works endorsed the importance of the preliminary phase of design and the role of creativity in this process. They also revealed the role and significance of images; their potential and challenges. Using remote sites as inspiration for redesigning local squares allowed for tracing the impact of globalisation and remote access on design decisions.

The VirtuSquare workshop made students realise the importance of the preliminary design stage. Thanks to the methods and techniques implemented during the workshop, students' approach to the design task became sovereign. A choice of sites (one local and one remote) gave students a sense of freedom in formulating a design problem, better recognition of the complexity of the design process and a consciousness of their responsibility for the design result.

On-site and on-line analysis and observation of the sites for their juxtaposition were more careful than for a traditionally conducted design task. Students focused on identifying elements of the squares of different scales: landmarks, textures and colours, and behaviour of people - the squares' users. The results of the analytical phase of the design process inspired a widening scope and holistic approach to design, including spaces, moods, people and time. Proposing design solutions, students noticed the social context of places and eagerly presented their needs and preferences related to this aspect (Figure 2 above).

The expected form of a final presentation encouraged students to search for alternative ways of presenting a project and effectively and innovatively translating design decisions into images. The language of traditional architectural design (drawings, renders, graphs, analytical drawings and diagrams) appeared insufficient. Since photography and media developed over a hundred years ago, visual communication has become powerful: multi-layered, coded images transmit complex messages and meanings more attractively, quickly and precisely than verbal ones.

Over the decades, the recipients have learned to decode visual messages and accurately understand their content. Some messages are already globalised and clear for everyone, while others have local context and meaning. Images inspire and strongly affect emotions. In the digital era, designers (and students) have unlimited access to them. Easily accessible images strongly influence students' imagination and ways of expression. Unconscious loanwords and plagiarism are inevitable.

Nevertheless, in their design proposals authors creatively and responsibly used available tools to create and transform images (Figure 3). The use of superimposition and collage techniques helped students confront the complexity of the

task. Students successfully built scenography and scenarios instead of technical/realistic drawings to strengthen the work. They also juggled with the scales to underline the design elements, which positively raised the quality of the proposals.

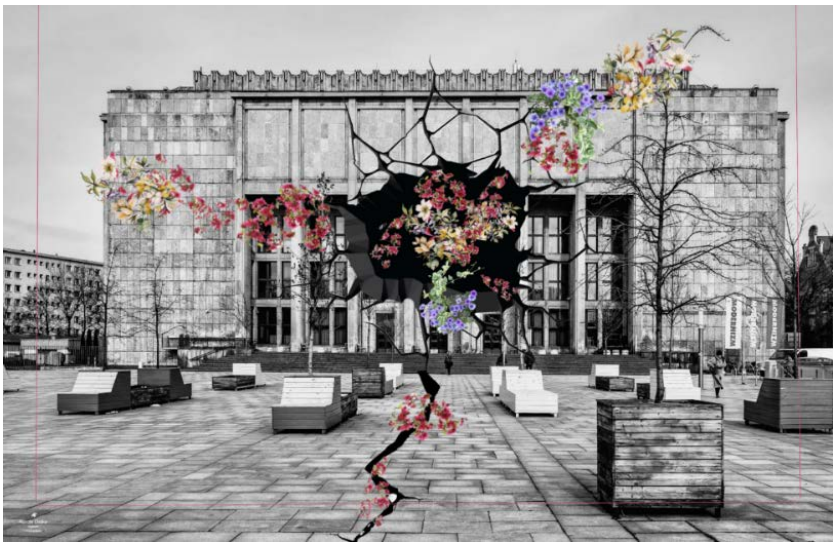

Figure 3: Example of student work - 3.

A review of the workshop design proposals shows how globalisation and digital access to remote (unknown) places impact architecture and its tools. Visual language is universal and understandable to everywhere despite cultural differences that are difficult to reveal through images, movies and Google Street Viewer, even if they seem complete. Sense of place and local users' perceptions are challenging to uncover remotely. Similarly, no remote access to social ties and relationships limits architecture and urban solutions. The VirtuSquare workshop made students aware of the potential and limitations of designing from afar. Bravely breaking the rules and going off the beaten tracks, students expressed *magic*: poetic, subjective and ambiguous aspects of the urban space (Figure 4).

Figure 4: Example of student work - 4.

Student Perspective

Analysing the workshop course and student work leads to the conclusion that the workshop - an element of the preliminary phase of the design process - enriched students' understanding of architecture and its context and enabled them to gain new skills and ways of presenting ideas and thoughts with visual language. Table 1 proposes structuring the advantages into two main groups: the first relates to the design proposals' quality, and the second refers to student attitudes that changed due to the workshop. The most significant change occurred in two areas: 1) the context of architecture significantly widened; and 2) the sense of entitlement to formulate own design proposals based on personal

experience and feeling. What is important is that these competencies are essential for the following stages of design: solving more complex design problems and successfully facing contradictions and conflicts.

Table 1: Workshop learning outcomes related to the preliminary design phase's main components.

Personal expression of a student	
Quality of design proposals	Change in student attitudes
- Personal and sovereign (independent) approach of a student to a design task - Breaking the rules and going off the beaten tracks in the design process	- Self-efficacy - Perceptivity - Courage
Enhancing sensibilities/impressions	
- Emphasising, and thus valorising, selected elements of the urban space to be transformed - Better recognition of the complexity of the design process - Recognising *magic* (poetic, subjective, ambiguous) aspects of the urban space - Noticing a social context and presenting one's own needs and preferences related to this aspect	- Mindfulness - Self-consciousness - Joy of creativity - Human-related approaches
Open-ended representation	
- Building scenographies and scenarios instead of technical/realistic drawings - Juggling with the scales - Recognising multi-layered aspects of the urban space as complementary to the traditional tools (drawings, renders, graphs, analytical drawings and diagrams)	- The praise of creativity - Extracting the essence - Widening the scope (holistic approach: spaces, moods, people, time)
Learning and experience	
- Image manipulation software uses - Virtual and distance experiences and their possible integration into the on-site process	- Meaning of images - Possible uses of images

DISCUSSION AND CONCLUSIONS

The value and novelty of the above-described teaching method correspond to the complexity and multi-layered factors conditioning the process of shaping a city space regarding social and cultural issues. It supplements traditional teaching methods with new technologies that encourage and support such an approach to design. As the authors explore these multifaceted challenges and timeless concerns, it becomes evident that the scope of inquiry may exceed the bounds of this article's limitations.

While the desire to delve into each issue with exhaustive depth is compelling, time and space constraints necessitate a more focused examination. Therefore, this article endeavours to navigate the intersection of these critical contemporary and perennial issues within architecture and architectural education, offering insights into their intricate interplay and potential ramifications. The authors have not attempted to answer these questions but rather examined their multifaceted potential in discourse and practice, doing this by a focused case study within the confines of the architectural design studio, acting as a laboratory for examining concepts and possibilities in a playful and experimental spirit.

In this article, the authors presented a case study in the form of a short studio exercise (VirtuSquare). It proposes a holistic examination integrating three distinct vectors within the architectural design process. Through a unified approach, they explored how these vectors intersect and interact to shape the overall creative endeavour. Firstly, they delved into the design studio's inception phase, where students structure problems, fostering creativity in its most raw and potent form.

Secondly, they analysed the role of images within the contemporary digital age, considering both their challenges and possibilities in architectural design. This involves understanding how the overabundance of imagery influences design decisions and communication practices.

Lastly, they investigated the impact of globalisation and remote access on architectural design, elucidating the challenges and opportunities they afford within the broader context of the design process. By examining these vectors in a unified manner, they aimed to provide a comprehensive understanding of the intricate dynamics shaping architectural education and practice in today's globalised and technologically driven landscape.

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