CONFERENCE PROCEEDINGS / DEPARTMENT OF ARCHITECTURE, UCY / 23-25 OCTOBER 2019

INITIATIONS

PRACTICES OF TEACHING

1ST YEAR DESIGN IN ARCHITECTURE


INITIATIONS
NARRATIVES & METAPHORS
EDUCATIONAL MODALITIES
RECONSIDERING RITUALS & STEREOTYPES
HAPTIC & VISUAL APPROACHES
METAMORPHOSIS & HYBRIDITY
BODY AND OTHERNESS
FORM AND ORDER
URBAN CONTEXT & THE EVENT
INVENTING FUNDAMENTALS
EDUCATION AS TRANSITION
TEMPORALITY & REPRESENTATION
PHENOMENA & ABSTRACTION

INITIATIONS
practices of teaching 1st year design in architecture

23-25 October / Nicosia
Conference proceedings of the TFYD 2019 ›

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Introduction

This book holds together the proceedings of a three day international conference on architectural education that took place at the University of Cyprus, in Nicosia, between 23-25 October 2019. The conference focused on first year design teaching and the broad theme under examination was how we introduce students in the world of architectural design.

Entering the field of architecture often, still, holds something from the tradition of the master-apprentice model of education or training, despite the fact that the medieval craft guilds may have long been gone. Relics of this tradition can be traced, in the implicit principles of the various schools of architecture, which are usually not addressed explicitly in the curriculum or design briefs of their studios. The purpose of this conference was to present, expose, map and critically discuss the methods and norms, symbols and narratives, customs and dispositions of current practices of first year design teaching, through the term 'initiation.'

'Initiation' can be understood, first of all, in a temporal basis, specifying that the conference was focusing on the challenge of teaching design at the very beginning of architectural education. At the same time, though, the term was selected because of its rich social or political connotations, as involving some sort of ritual or rite of passage that allows someone to enter a group. The discussions that took place during the conference, as well as, the papers that are been published here, have taken different stances in relation to these two readings. The interpretative framework of each stance has ideological implications, exposing a series of other positionings regarding not only architectural pedagogy, but also the very nature of architecture.

Moreover, initiation in the field of architecture through the first year of education was found to be important since it has the power to be quite formative in shaping the future professional

architect. The conference revealed that multiple pedagogical approaches coexist, each prioritizing certain values over others, often driven by a different understanding of what the role of the profession of the architect is or should be in society. It thus seems inevitable that any discussion on educational agendas should also discuss the role of the architectural profession, especially now that professional boundaries are reassessed, diluted or even dissolved.

Initiating students in first year design studio is a pedagogical experiment that sets up the fundamentals of architectural education: the ethos, creative energy, drawing and making skills, curiosity in exploring and developing ideas, understanding context and how architecture frames ways of living. In this sense, teaching first year architectural design is many things at the same time: a huge responsibility, an arduous process, a joy. And while there may be many paths to choose as a studio instructor, one specific pedagogical approach is chosen each time.

During the conference a number of questions rose that were directly or indirectly addressed concerning spatial, contextual, communicational, methodological and pedagogical concerns:

Spatial Fundamentals in Design

- 100 years after Bauhaus, is the notion of the 'fundamental' in design still relevant?
- How can the multiple dimensions of space be reduced, studied and explored?
- How are scale and the body introduced in the design?
- How is the temporal dimension introduced in the design process?

Learning the Language

- How to communicate with someone who does not yet speak the language of design?
- Are the traditional drawing and modeling tools adequate in studying and representing space? In what ways can visual communication be complemented?

- If any medium of communication is far from being an innocent representation, how is such complexity conveyed and understood by those using the medium?
- At what stage is the computer introduced in architectural education?
- How do social media, digital tools and ICT in general affect the students' understanding of space and what could their role be in education?

Introducing Context

- How can we introduce the context and the complexity of the city in the first year of architectural education?
- How can we cultivate ecological awareness in creative ways?
- How can the dialogic relationship, between the local and the global, be introduced?
- How do we expose students to other cultures, places and landscapes?
- How do we cultivate students' capability to absorb knowledge that comes from other contexts in critical ways?
- How are precedents useful in encouraging creativity and innovation?

Didactics and Pedagogy

- How to introduce subjectivity when novices are predominantly trained to think objectively?
- How much and in what way are notions such as 'quality' and the 'ethical' relevant at this stage, and if they are, how can they be addressed?
- How to take advantage of skills the students already have in a more structured way?
- Are interdisciplinary design methods useful in first year design studio teaching?

The selected papers were categorized in eight themes in order to better structure their commonalities and juxtapose their different

viewpoints and responses to the above questions in productive conversations and dialogue. These themes are presented in this book in the following order:

Narrative and Metaphors

Educational Modalities

Reconsidering Rituals and Stereotypes

Haptic and Visual Approaches

Metamorphosis and Hybridity

Body and Otherness

Form and Order

Urban Context and the Event

Three invited keynote speakers made critical presentations with papers that covered theoretical reflections, pedagogical experiments and ecological approaches and methods around the conference theme on first year architectural design teaching.

Alberto Pérez-Gómez, Professor, McGill University, Montreal

Patrick Weber, Associate Professor, The Bartlett, UCL, London

Anna Heringer, Architect, Laufen, Germany

The conference took place at the Department of Architecture, University of Cyprus, at the Ledras Building.

We would like to thank the Cyprus Ministry of Education and Culture, the Deputy Ministry of Tourism and the Department of Architecture at UCY, for their support towards accomplishing the event as well as the current publication.


Initiations into Architecture
A Meditation on Poetic Making (*techné*) and Appropriate Words (*práxis*)


ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΥΠΡΟΥ

Narratives & Metaphors

Translation and Narrative as Foundations for Spatial Literacy in Environmental Design

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Abstract

The bachelor of Environmental Design at the École de design, Université du Québec à Montréal, is a transdisciplinary program that addresses built environment issues across scales and disciplines. The program was recently overhauled to further underline its transdisciplinary objectives between industrial, architectural and urban design. In the first semester of the first year, the program modification has meant the splitting of a single design studio into two parallel studios in which students operate between the requirements, knowledge and skills particular to spatial and material culture. This paper outlines the approach taken in the spatial studio, or ***Spatialité et parcours***. The narrative arc for the studio starts with the student's own body in a given spatial sequence to the abstraction of both body and sequence into increasingly complex and intertwined spatial figures, none of which has either program or function. Across seven short design exercises, a range of concepts and tools are introduced, framed by four principal vectors: abstraction, inter-scalarity, translation and narrative, understood to be foundations for spatial literacy in environmental design. The notion of ***parcours,*** here, breaks away from path as architectural promenade to introduce the spatial agency of movement through translation and narrative. By expressing a relativistic view of space and time, translation and narrative tie spatiality to movement, relations, transformation and assembly. Spatial possibilities are determined by making sense of the relative movement between bodies, their organization and relative position, as well as of the movement between scales, abstract forms and representations.

1. Context

This paper outlines a design studio I coordinate in the Environmental design program at the Université du Québec à Montréal (UQAM) School of Design. In presenting the main lines of the studio, I want to emphasize the way translation and narrative are used as conceptual frames in the development of spatial skills and literacy. UQAM's bachelor of Environmental Design is a three-year transdisciplinary program that addresses built environment issues across scales and disciplines. The program was recently modified to further underline its transdisciplinary objectives between industrial, architectural and urban design. Rather than object, building and urban studios in the second to fourth semesters, we now have studios based on increasing scales, 1:1, 1:100 and 1:1000, with traditional optional studios across disciplines in the third year (Table 1). In the first semester of the first year, the program modification has meant the splitting of a single design studio into two parallel studios, *Spatialité et parcours* and *Forme et matérialité*, in which students operate between the requirements, knowledge and skills particular to spatial and material culture. These are two half-studios of 4.5 hours a week over the 15-week semester, and so relatively short in comparison to the regular 9-hour studios.

S1	S2	S3	S4	S5 1/2	S5 2/2	S6
Spatialié et parcours	1:1	1:100	1:1000	Option studio	Option studio	Option studio
Forme et matérialité						

Table 1. Studio courses per semester in the three-year bachelor program in environmental design

While our students' first-year practical learning has to be seen as the dialogue between the spatial and the material studios, I will concentrate in this paper on the spatial studio, which I have been teaching since 2017. One of the studio's challenges is to address space across scales and without an architectural bias, while still offering a foundation for later studios that will address projects including small to urban-scale buildings. One of the underlying objectives, then, is to bring students to reason with space and apply spatial concepts transversally across the multiple objects of design.

2. Spatial literacy

The syllabus, therefore, has to develop and support conceptual spatial reasoning that is in keeping with the pedagogical objectives of environmental design. This has led, for the first-year spatial studio, to some pedagogical choices that are straightforward, like abstraction and inter-scalarity, and others less so, which I will present in more detail, like translation and narrative. By disconnecting recognizable functions and uses from form, abstraction allows us to avoid language specific to a particular scale of intervention, whether object, building or city. In doing so, abstraction establishes relations across the spectrum of possible spatial figurations and their perception. Inter-scalarity is a key aspect of environmental design,

which proposes to address design preoccupations across multiple scales of intervention. Being able to think with space, for our students, means that in addressing the problems of design, they are comfortable moving between scales, for example addressing landscapes by their objects, and objects by their landscapes.

In building up the way our students think and reason with and through space along the lines of abstraction and inter-scalarity, the studio introduces a conceptual lexicon and a series of representational tools. The spatial literacy at play, here, is what Fern Lerner (2018) defines as the knowledge of spatial concepts and the knowledge to apply them in order to wield form, meaning and aesthetic considerations, both physical and conceptual. [1] Her general definition for spatial literacy is constructed in the lineage of early development aesthetic learning from Froebel and Piaget, to the experiments of the Bauhaus – a strong influence of the program in which I teach – that establish effective relationships between form, matter, space, perception, reasoning, imagination and abstraction. Spatial literacy can express a general objective for our studio, especially because of our program's aim to develop a transdisciplinary design approach across scales and the concept's development as a preoccupation across disciplines. Karl Grossner and Donald Janelle's study, for example, surveys spatial concepts across disciplines, between sciences, engineering, design and humanities, to compile a list of transverse concepts. [2] While their survey is useful in developing an abstract lexicon that touches on multiple scales (geographical, social, urban, architectural), it is limited with respect to spatial transformations.[1] However, the categories that emerge from the study can be useful in dividing spatial concepts for our studio: spatial dynamic, time-space, interaction, position, principle, property, relation, representation, structure, transformation. Extending the lexicon to include design-specific concepts that are operations, we can further regroup the concepts and categories into three families that deal with elements, analysis, and operations (Table 2).

Elements	Analysis	Operations
Spatial representation	Spatial dynamic	Spatial transformation
Spatial structures	Spatial interaction	
Space-time	Position	
	Spatial principles	
	Spatial properties	
	Spatial relations	

Table 2. Spatial concepts categories from Grossner and Janelle (2014), regrouped according to studio objectives

[1] Because the literature on the subject is usually meant to develop spatial literacy across disciplines and principally in fields other than design, the frameworks will often be lacking spatial concepts that express spatial transformation, both geometrical and metaphorical. Grossner and Janelle's study, for example, is limited in that it focuses on "seminal texts" in each discipline. This is especially true for architecture and design for which texts are analytical texts rather than manuals for practice.

The operative language of transformation presented to students is thus a way to ground spatial knowledge in design. In the studio, the development of our lexicon is organized as a sequence across the exercises, with elements and relations first, principles and dynamic second, and transformations third, and so moving from observation, to analysis, to design intention. The application of spatial concepts is supported by the introduction of design and representational tools. We follow a line from 2D drawing, 3D drawing, low-model, installation, 3D model, image, and 3D model, 2D drawing and image combined. All the work is done manually, and digital tools are used only for image manipulation. Throughout the term, as we will see below, we parallel these tools with sound and video as other modes of spatial representation.

The previous version of this studio, for almost 20 years, was based on the idea of *parcours*, a word difficult to translate, at the intersection of path and journey, both the thing travelled and the act of travelling. The development of spatial literacy culminated in the conception of a "qualified path", which ran the risk of being understood and reduced to the architectural promenade. Changes made in the last three years break away from this notion of *parcours* to introduce the spatial agency of movement through translation and narrative. The studio, therefore, retains its foundation in movement with respect to space, but ties this movement to the act of making and giving sense, of structuring and assembling.

Space is thus defined by the movement between element and assemblage, pretext and project, and concept and form across different media. Translation, in this sense, is both the geometric operation that describes the change in position of an object, the translation of the body across space, as it is the act of translating (moving) a text into another language while attempting to convey its meaning and intent. Both cases are productive of space, in the first case physical space and in the second the space that Walter Benjamin describes in "The Task of the Translator", one that exists beyond the content or subject matter.[2] [3] In the studio, this latter space has two parallels. It means that there are specific spatial qualities that one representation will express over another, even if their subject is the same. It also means that the space represented by all these different modes, even in its multiple variations, is the (multiple) space of the project. Moving a project from one mode to another, from drawing to model for example, will inform the spatial quality of the represented project in different ways and offer different spatial possibilities that are never reducible to a single form. Paraphrasing Benjamin: for our students, this means underlining that the potential for the next drawing, the next model, is already contained within the previous [4], to whom it owes its existence, but does not serve [5]. It is by virtue of these multiple translations that spatial qualities are discovered, and that the project advances and takes form. The historian William Whyte summarizes a similar position regarding the multifaceted process of architecture: "it is about the way in which an initial concept is translated from idea to plan, from plan to drawing, from drawing to building, from building to use, and from use to interpretation by users and viewers." [6] In Whyte's reading of the architectural project, the meaning of the work is given by the way it is transposed from one genre to another. Each variation of the

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[2] Benjamin's English translator uses the words region and realm.

project produced has to be understood in relation to the whole, as well as within the specific context its production.

If translation points to the way that space is the result of moving bodies, texts or representations between frames of reference, narrative points to movement itself as well as the structure that authorizes its sequence. In *The Practice of Everyday Life*, Michel de Certeau theorizes the reciprocity between space and story, where "narrative structures have the status of spatial syntaxes" and spaces are places practiced by stories. [7] In this case, the ties to *parcours*, to a linear path and to the movement describing a path, are still implicit. In the first half of the semester, then, the body moving in space is a recurring theme, and a first measure of spatial possibilities for students as well as a register to their immediate spatial experience. In the second half of the term, however, we turn to narrative as an organizing principle, or what Sophia Psarra describes as narrative's potential to represent "a coherent world out of conflicts, and [satisfy] our desire to see them resolved into carefully crafted and rigorously ordered propositions." [8] Rather than the literal story of a body moving in space and generating space through displacement, narrative now describes an architectonics, or the way in which parts relate to a whole in a logically designed assembly. At no point, then, do students translate a written narrative into a spatial configuration. What we have, rather, are spatial resolutions of transitions and relationships between varying spatial principles. The spatial composition is a topological proposition, read as a narrative, rather than an expression of a body's linear displacement.

3. Studio outline

The studio is constructed as a series of short exercises that each dovetail into the next. We move forward in the term by recuperating and translating a fragment from the previous exercise, switching its scale, projecting its occupation, giving it a new role, abstracting its conceptual potential. The entire studio is thus conceived as a project in which each successive exercise plays an incremental part. Within each project, translation happens between media, language, abstract idea, form, spatial qualities and assemblages. The concepts of translation and narrative, therefore, are seen as overall arcs for the course, as well as operative principles within each exercise (Figure 1).

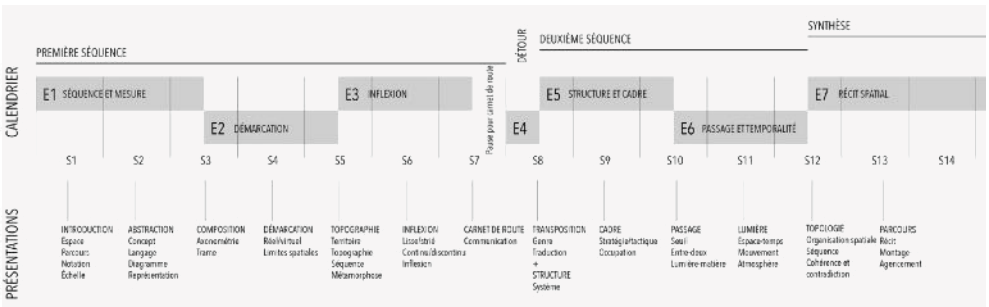

Fig. 1: Sequence of exercises over the term, including the presentation of concepts.

Students start with an exercise in which they measure a given space using their body as a measuring instrument. Walking through the space, they methodically photograph their surroundings constructing visual section cuts (Figure 2). They then draw the sequence in section and plan (1:200 and 1:50), and draw abstract diagrams of spatial principles. The sequences for the first exercise are usually chosen for their capacity to express the multiple scales at which the students will later work: the body, the object, the edifice, the city block, the neighbourhood, the city. The exercise aims at identifying space-defining elements, analyzing them and drawing out the principles that underpin their logical organization.[33]

The next exercise introduces three-dimensional drawing, taking the initial plan as pretext, and expanding and modifying its spatial limits. Grid and matrix are introduced as principal concepts alongside transformative operations. The original site is here abandoned, to move fully into abstraction.

The third exercise introduces topography through the concept of inflection as developed by Bernard Cache in *Earth Moves*. [9] Using a cut through one of their initial drawings as pretext, students switch to a landscape-appropriate scale (1:200) and devise a stratified and articulated terrain (Figure 3). Rather than design in plan from above, they design their terrain as a succession of iteratively modified section cuts, arranged in sequence along vectors of displacement. The terrain unfolds as they move through. Students first design a fluid, logical sequence, morphing the initial section cut over 30cm (or 60m). They are then asked to introduce an inflection to their sequence, an event that disrupts the terrain according to a coherent and precise intention.

The in-class presentations of the exercises and concepts are always preceded by listening and/or viewing an analogous piece of music or video. The piece acts as a prompt in order for students to discuss abstract notions before these are anchored to design concepts. In this way, translation is the starting point of each exercise, as the pieces express the spatial qualities to be explored in the exercise. For example, in the first three exercises: the video for the Chemical Brothers' *Star Guitar*, directed by Michel Gondry, is the pretext for the elements of spatial compositions, as well as basic notions such as distance, dimension, movement, sequence and scale; *Snowforms*, by Murray Shafer, the Canadian composer who defined the concept of "soundscape", is the pretext for topography and inflection, as well as structured sequence; and *Music for changing parts*, by Philip Glass, is played over drawings of the Great Mosque of Cordoba as a prompt for discussing grids, limits and expansion.

At mid-term, prescriptive exercises give way to exercises in which design intention takes more importance. At that point, the studio takes a *detour* for a three-hour long collaborative exercise on translation. Students are given a short piece, usually music or video, that they must translate to a scale-less spatial figure using only the materials they are given. For example, one version of this exercise asked to translate a choreography by Anne Teresa de Keersmaeker for *Clapping Music*, by Steve Reich, to a spatial figure using string.

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3 Most of our students have never drawn and will only be given technical drawing lessons in the coming months. One of the biggest challenges we face in the studio is to develop basic tools for representation without being a technical course on representation.

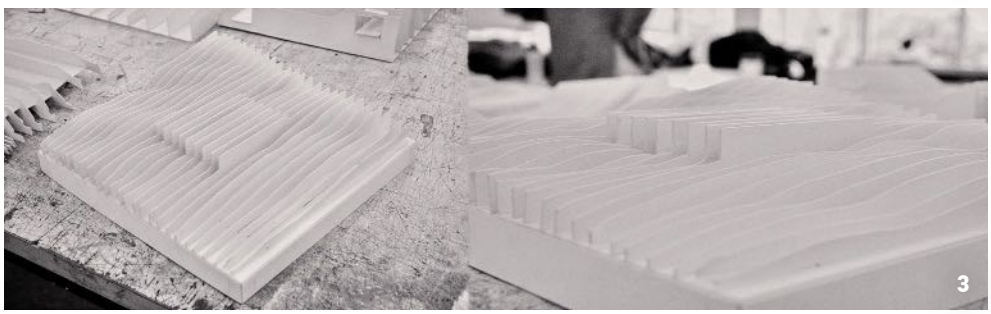

Fig. 2: Measurement photo for first exercise (credit: Mélissa Caron-Labrecque)
Fig. 3: Terrain model (credit: Marie-Eve Martin)

The next exercise introduces occupation through the concepts of structure and frame. Students are asked to formulate an intention, as pretext, expressed in a series of key spatial principles. These are then translated to a three-dimensional self-supporting structure at 1:50 that offers multiple frames of occupation and possibilities for spatial expression (Figure 4). Occupation is seen here as either continuous with the system developed or as a differential insertion that destabilizes it, playing on stability and instability as analogous to frame and occupation.[4] It is with this exercise that narrative becomes architectonics, as the movement of the body becomes the movement of the eye through the created space as we project its occupation and test its scale.

The penultimate exercise focuses on transition and time, reintroducing the temporal aspects of space through movement introduced in the first exercise. The assigned material is light. As a pretext, students use the structure from the previous exercise to explore the way this one reacts and transforms under different lighting condition, taking close-up photographs that lose all exteriority of the object. Working with a fixed point of view, students then design two related transitional spaces each based on a distinct temporality. No scale is given. Rather than work on models to be handed in, students hand in only two images, one of each passage, that are the result of constructions whose sole purpose is the fabrication of the image (Figure 5). While the scale projected could be the scale of an object, both images have to express interiority. The images speak to spaces that are other than those expected, to the way light as a material shapes space and evokes narrative and cinematic atmospheres.

The final exercise of the studio synthesizes previous exercises into one. Using all previous exercises as pretexts, students design a complex spatial story based on a logical assembly between distinct spaces (Figure 6). Students are presented with the idea that all the previous exercises contain the final project within, as a text contains its potential translation. Or, following Whyte's argument, that each previous figure or concept represents a particular genre and form of the synthesis: sequence, composition, delimitation, topography, inflection, structure, frame, passage, time. While the exercise is at the given scale of 1:50, there is no site, no function and no projected use.

As stated earlier, the challenge posed by the introductory spatial studio in our program is to find a way to develop spatial literacy across scales, without bias toward a particular discipline. Following a tradition of Modernist teaching in the studio largely focused on architecture, some changes were made to further underline the transdisciplinary objectives of the program, while at the same time retaining its foundation in movement. Translation and narrative, as conceptual frames, do this by expressing a relativistic view of space and time that ties spatiality to movement, relations, transformation and assembly. Spatial possibilities are determined by making sense of the relative movement between bodies, their organization and relative position, as well as of the movement between scales, abstract forms and representations.

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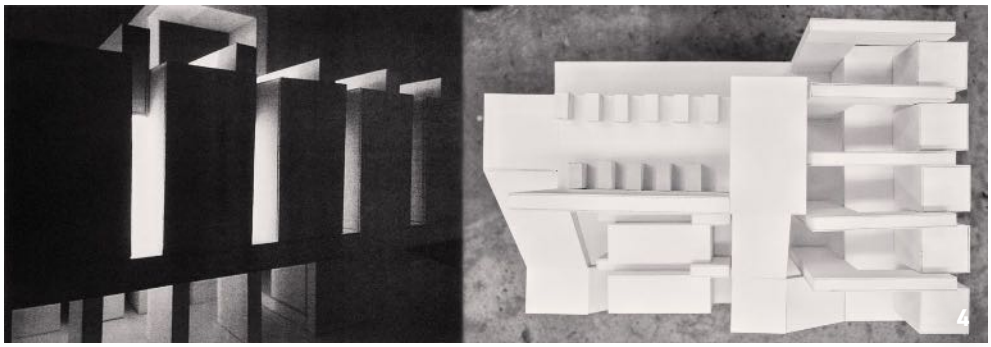
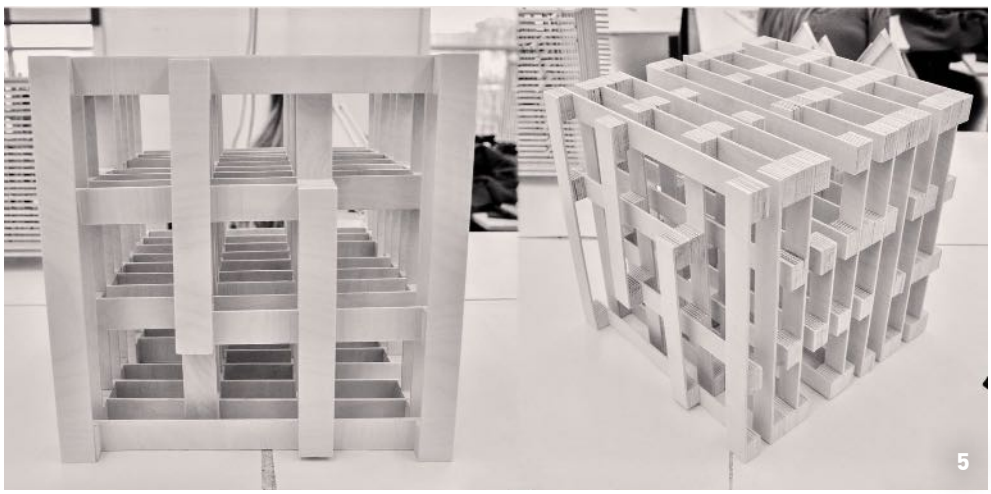
[4] The concepts of structure and frame are presented through the distinction that is made between frames of stability and frames of legality (Bernard Cache) as well as between collective formal structure and spatial expression (Herman Hertzberger).





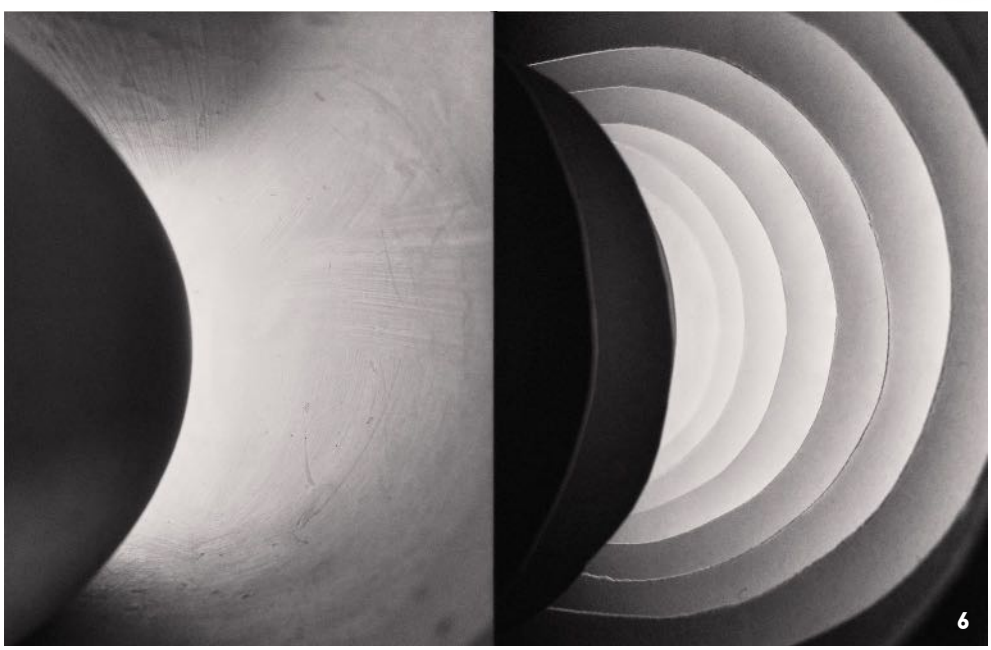


Fig. 4: Structure and frame exercise (credit: Stephany Beaumier-Durocher)
Fig. 5: Transition and temporality exercise (credit: Marie-Eve Martin)
Fig. 6: Spatial story exercise (credit: Christian Molina)

Taken in isolation, the work in this studio cannot account fully for the spatial reasoning particular to our program. This one would be found in the dialogue between spatial and material literacy as set up between the two introductory studios. The final synthetic exercise is where we usually notice resonance between the parallel studios for our program's first semester. The material studio's most involved project takes place after mid-term, while ours takes place at the end of the semester. It is usually around mid-term that students start reflecting on the relationship between the two studios, wondering where, how and why they might overlap. Crossovers are therefore common toward the end, and translations often happen between studios, with material explorations influencing spatial reasoning. By incrementally making sense of such translations, students are actively figuring out what spatiality could mean in environmental design.

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Productive Jumps
1st Year, 1st Semester, Design Studio at the University of Edinburgh

Laura Harty | Susana Do Pombal Ferreira

Abstract

We arrived hungry. Waiting outside in a queue, bodies jostled alongside us, laughing, boisterous, brave. Partial faces were caught by bright downlights, neon streaking through shadows, rendering colours lurid. Categories of definition appeared distorted, activated raw loose particles energizing our homogenous mass. Anticipation was palpable, breaths visible and nerves tangible. There was something going on. We heard a faint, pulsating beat moving through the darkness of the walls, behind the anonymous gatekeepers, luring and fluid. The doors opened, and the jostling pushed us deeper, new bodies shifting position, new orders establishing. Compelled forward, the physical presence of the sound resonated louder, until our very interstices were vibrating in tandem. Structures previously regimented were dissolved, and the porosity of categories seemed ripe for rearrangement.

1. Introduction

Teaching first year design has this very energy and anticipation at its core, and yet, designing first year teaching requires us to set particular conceptual and methodological frameworks in place which maintain and provoke this palpable potential. In this paper, Susan Do Pombal Ferreira and myself set down our initial responses in charting this trajectory across the 2018-2020 first semester design studio through the Edinburgh School of Architecture and Landscape Architecture (ESALA) at the University of Edinburgh.

To document and share this process with you all involves speaking. Speaking the design of our teaching. Necessarily, this notion of speaking favors sequence over simultaneity - a reality which maps sensibly onto the unfolding of the studio teaching across the year but which does not adequately reflect the iterative and synchronic aspects of many of its exercises. However, the operative devices present in speech provide useful reflections on aspects of the teaching design and remain productive within the student work. Therefore, speech itself provides the design for this paper, in which we both recollect and represent the design moves made. Recognition, Articulation, Proposition, Designation and Inflection are the categories through and by which this paper will be delivered. Each of these have had significance in terms of designing first semester teaching and teaching first semester design. Within each category we will detail a specific condition which has defined our context and refined the studio output. Performing and inhabiting the categories of this paper are work by students of the 2018-2019 and 2019-2020 ESALA first year cohort.

2. Recognition

To recognize is, in the first instance, to perceive that which may already be known. To recognize is also the action of acknowledgement of that which is known to be true but which, equally, might be worthy of re-consideration. Under this auspice, it is worth recognizing that 2019 marks the tenth anniversary of the first intake of students within the amalgamated architecture programmes of the Edinburgh College of Art and the University of Edinburgh. Formerly, these two distinct schools within the city had their own particular pedagogical drive, their own staff profiles and their own approach. The repercussions of this 'complex and challenging' [1] agglomeration, now called ESALA (Edinburgh School of Architecture and Landscape Architecture), entailed the coagulation, filtering and restructuring of this pairing which recognized the strengths of both programmes and offered these a place within the modular components of the university structure. In brief, the University absorbed the College of Art, but gave it, in turn, notational autonomy over the five constituent schools (Schools of Architecture and Landscape Architecture, Music, Art, Design and History of Art) which make up its remit. A double digestion, neither absolute, nor static, it remains a work in progress.

Inevitably, the necessary synthesis implicated concentrations of certain themes and strategies from the individual first year courses of both schools, and the clear semester divide allowed each to be maintained and implemented within their own designated semester approach, the first known as Elements, the second: Assembly. With reflective

Fig. 1: (Image from the College Archive © Edinburgh College of Art)

Fig. 2: Group work, Elements 2018 (Photograph by author.)

Fig. 3: Old Town Walk Routes, overlaid on William Edgar's 1742 map of Edinburgh.

Fig. 4: Old Town Walks, Sketchbook showcase, Hastie's Close (Photograph by author).

Fig. 5: Clay Model Workshop 2018 (Photograph courtesy of Rachael Scott + Andy Siddall).

amendments, these core courses have endured for the ten years since. For to recognize is to call to attention, a call which often has the capacity to unsettle. The precise diagnosis or resolution of this recognition may not be especially clear, and yet it exists and asks to be studied, questioned, inspected. In this paper we aim to span the objectives of the first semester in particular, consolidating and reinforcing the pedagogical priorities across the year as a whole. Destabilizing previous understandings, and equally offering a chink of possibility, recognition can offer a space which is equal parts homecoming and launchpad.

3. Articulation

Edinburgh itself sits firmly at the centre of this coupling. A landscape formed of fire, an igneous and metamorphic site, the ground tells of its own morphology, and the forces which acted, and continue to act on its severe and powerful contours. It is a city of section, mass and void, levity and weight. Ten story tenements recreate escarpments against which narrow vennells cut and chase. Avenues drop into chasms, streets appear four stories up bridging solidities. Regular verticality is offered in counterpoint to the rhythmic shifts in sinuous and woven horizontals which scale the dolerite plug. Within this highly wrought and intricate composition, many lessons lie. The lure of its lore draws many students to study here, and a foregrounding of its presence is the first sampling we have turned from a beat into a break.

Scraping their fingers along its interstices, students are first tasked to document these shifts in line and level, denote

the sharp contrast of light and shadow, recognize the shelter and exposure that they offer, and hence to internalize this tangible and shifting external reality as something which they can anchor their genesis to and develop their skill set from. Walking on prescribed routes through the city, over the course of the first three weeks, we ask the students to look and record their journey through particular elemental concerns. These elements are suspended intentionally between abstract and quantifiable domains, with planes of enclosure introduced weekly - groundscapes, wallscapes and roofscapes. [2] Each 'element' is linked to and explored within a particular drawing type - section, plan and perspective, denoting ideas of 'upon' 'between' and 'within'. The students are placed within the situation, integral to its unfolding. For at first the routes are unfamiliar, understood through received intuitions. Later previously made drawings may provide ground for productive jumps. The drawing exercises ask the students to reach out, to assert their potency, to recognize the effect of their record on their reading of the city. These exercises link lived experience with produced experiences worked up in later studio development. Experiences are sedimented on exercises, drawings are worked into, and models developed iteratively, adding, overlaying, editing and juxtaposing.

The articulation emerges through the interaction with the surface of the city and the surface of the active substrate. To articulate is to put shape on, to describe, to denote, to determine. That this shape, description, denotation, determination occurs as much in the action of making as in the action of observing is the task and subject of this lesson. From the point of Alberti's De re Aedifactoria [2] onwards, to articulate means to place marks in relation to one another proportionally as a means of instruction. The proportional agency of the line itself,

linking the intention which initiated it, and the potential to which it is directed, is a subject of attention and a portal for future possibilities. For to articulate means also to be composed of parts, record and fiction working with and against each other. In this scenario involvement and iteration are the only requisites.

In the studio, we ask that the students re-compose their observations in clay, which is sliced and stamped for plans and sections. These stamps physically reinforce the abstract notions of prescriptive geometry and ask to be documented and inhabited through a combination of 1:1 drawing and 1:50 scale occupational strategies. An articulate surface is made up of parts, planes, interfaces, reveals. To articulate within an architectural context is a conceptual relationship between inner and outer experience. The students tend to get frustrated that their output isn't as succinct, sharp, precise, as the imaginary they might have in their heads, and yet, the flaws in architectural notation may sometimes offer points of development within the scheme as read or understood. The Albertian dyad of lineaments, lines in the mind of the architect, and their material presence in their external reality (the naive drawing or the compromised building) is a struggle, a paradox and equally a driver of communication. The original notion of recognition operates within each articulation, offering a critical and oscillating vibrancy which refines the controlling mechanisms. For to articulate means also to control flow, whereby the control is applied to focus direction, direct focus and carefully indicate the reciprocal position and space between entities. How to draw something in section, how to document a reading of distance, how to distinguish between materials. For clarity, variety and subtlety of articulation colours a type of performance, in which the attack, vitality and verve of approach will affect the gradation of interpretations and the precision of its reception. To articulate is to speak. These stamps become the first utterances.

4. Proposition

A proposition might be thought of as a riddle, a challenge the subject, as opposed to its answer. The proposition is a provocation, asking someone to step outside their own limits, asking how stable these might have been to begin with. A proposition, is often casual and potentially illicit. The proposition challenges established rules and offers a way to extend capacity, range and methods. This activity works as a polyphonic composition, constructed on the short themes of exercises which preceded it, in which new potential spaces are excavated and inhabited.

All the drawings produced thus far are to be copied, in multiple and brought to the studio. Students create a large wall mounted collage which links particular lines together and imagines an inter-connected series of spaces within, between, through the assembled drawings, areas may be cropped, overlaid, combined and pinned up on the wall as an enlarged and sprawling sequence. Individual students must then detract, lift, trace, select, refine these arrangements be overlaying the assembled collage with an A2 sheet to form a new spatial arrangement seen as a plan or a section. The student must then produce the alternative, plans, sections and models of the spatial arrangement selected. This space making is a proposition in that the geometric possibility of its resolution in three dimensions

is neither guaranteed or fully prescribed. The necessity of projection is implicit within the task, the fallacy of straightforward copying without interpretation is denied - for whatever is interpreted out of a work must first of all be interpreted into it. [3]

We are asking the student to pay attention to the demands of the marked surface, the interpenetration of volumes, the particularities of scale. Insights on notational particularities must be mined both for intent and for potentiality. This is not only an exercise in drafting and model making, but rather one in notational accuracy and in relevant reading. It asks that each of us project ourselves into the space of the drawing and take its characteristics as indicators for our future movements. We are asked to respond to and against these parameters. The site, and the context, are contained within the marked and interwoven surfaces. Spaces that we may have thought through ourselves will have shifted location, character, perhaps orientation. They may have been spliced with other spatial configurations, their logics shook up and unearthed. How then can we begin to understand the demands of this new arrangement, what propositions, supports, inflections are now necessary? For a proposition is also setting forth, presenting something to view or perception, an exhibition, a display, or instance of this. The potential of the collaged work to expose and share the range of annotation methods and means of articulation is huge. It also underlines the recognition that we always, in architecture must work between oscillations of projection and record, to measure, highlight, refine, make appropriate or challenge notions of appropriateness. In the proposition we expose ourselves, but within a shared framework and range of experience. A flight from one's own identity. It asks that we take root in an alternative realm, taking a risk which might certainly offer challenges, but also promises new methods of navigation. These new occupied reconfigurations are the elaborated, explored and developed in three dimensions as a space proposal in which areas to gather, to view and to hide are prioritized. Plans, sections and perspectives of these propositions are developed and presented as provocative beginnings.

5. Designation

To designate is the action or an act of marking or pointing out; the indication of a subject of interest, a focus for our attention. In the second project, we do just that. Within the folds of Edinburgh's Old Town fabric, some of the most vulnerable people seek protection. The intricate composition of the city, with its doorways and narrow thoroughfares which attracts tourists from all over the world, is also commonplace to startling levels of human deprivation. Far from being a simple backdrop, the city's complex nature both nurtures and denies. Walking through the rugged streets, it takes not long to notice the scale and urgency of the homeless crisis. Following on from the initial experiential approach to space in architecture through exploring relationships between ground, wall, openings and roof, the course focuses on developing an individual design proposal, which responds to a defined brief and a specific location in Edinburgh's Old Town. The cumulative sum of the work carried out in the first half of the semester provides the foundations for formulating a design strategy for a night shelter in the context of the analysis and exploration initiated during the

Fig. 6: Clay Model Stamps. Proto Sections. Elements 2018.
Fig. 7: Group work, Elements 2019 (Photograph by author).
Fig. 8: Clarice Cao, ESALA 2020.
Fig. 9: Jaaziel Kajoba, Elements 2019 (Photograph by author).

first three weeks of the term. The students are asked to design a small night shelter and soup kitchen (90sqm) for six homeless people per night in a site of the Old Town. The shelter must provide areas for sleeping, washing and eating. During the night, the shelter acts as a sleeping accommodation however, during the day it becomes an open venue, welcoming any person in need of warmth and a hot drink.

To designate is to set aside for a particular purpose, also it asks us to project ahead. In this project, we ask the students to return to their observations of the habitable interstices of the city and to put these into play in surveying given sites. For this project, we divide into six groups, on three sites. Each site is specifically selected to have a distinct section and tight spatial parameters so that the proposals are encouraged to both stack and lock tightly into the surrounding fabric. Context, both physical and societal becomes a recurring theme to which each weekly exploration, and corresponding depictions in section, plan and perspective are anchored and referred. How the sites are described, how they are designated will inflect on the decisions the students reach about how best to engage with and interact with them. Groups work on site models, to a scale of 1:50 and manufactured in parts so that elements may be removed and intervened with as the individual approaches require. The planning and making of the site model itself requires a group conversation on the relative dimensions, materials, merits and disposition of the site, already thinking through how it might be reconciled through the exercise of its manufacture. Of equal weight are the various approaches, outlooks, and relationships between these places and the wider city context in which they are positioned and accessed. Sequences of such observations are recorded and abstracted to denote notions of approach, entrance, sequence and support. Orientation, views and light are noted and their various repercussions tested in quick models, photographs of these, collage techniques and parti-diagrams. Weekly requirements of a single model and hardline drawings are supported through a series of shorter and longer timed activities in studio, incorporating various media to encourage productive reflection and iterative work practices. Design work occurs through the interface of these exercises, qualities of accommodation emerging in tandem with their articulation in plan and section. To designate is to identify and to categorize. Identifying with the subject matter through relevant lectures, screenings and discussions is coupled with research individually and in groups. The students are asked to open up the topic and to find their position within the conversation. For to designate is find a position, and from there to propose order. This ordering of sequence, light, and material through line, mass and volume must invoke empathy as much as describe space. The capacity of architecture to contain both is encompassed in this brief and evidenced in the resultant work.

6. Inflection

The notional separation between the two studio projects of the first semester, belies the underlying connection between each of tasks set, and the resultant projects. Each brief operates through the same range of streetscapes, of architectural elements (Ground, wall, roof) and representational tools (section, plan, perspective). Each are introduced in sequence

and inflected upon repeatedly throughout the semester. Their descriptions, accessible through models, stamps, lines, collage, and overlay encourage iterative reflection and make manifest corresponding productive jumps. Learning from one another as much as from the prescribed teaching, energizing and supporting the group dynamic is essential. We value also our urban context as an actor in the design process, recognizing its inflection upon the design decisions. Our awareness of architectural elements, and correspondingly that of our students, is both filtered through and acknowledged in reference to this inexhaustible teaching tool.

In linguistic morphology, to which the structure of this essay relates, inflection is a process of formation, in which modifications permit various meanings of relatively fixed words. It is the procedures of modification, rather than the word which is itself modified, which allow categories and families to be traced. The inflection is the proof of a rule-based grammar, which permits the coherent expansion and propagation of the language. As a lesson for a teacher or design, or rather a designer of teaching, the concept of Inflection asks us to respond proactively to such rulings, recognizing its procedural basis as the common entity, upon which each of the sections above riff. This work is not simply a propaedeutic stage before the real architectural design education begins, but rather an incubator for creative experimentation, with all components already activated for future action. Instilling an awareness of design process, arrived at through analysis and research individually and in teams is understood as an inflective process, inviting coherent expansion and propagation of the discipline. The initiation therefore, at ESALA, introduces architecture through its procedural interactions, viewing architectural elements not as fixed considerations, but rather porous categories ripe for rearrangement.

Acknowledgements

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[4] Niall McLaughlin & Emily Doll (eds) ***Twelve Halls*** London: Niall McLaughlin Architects. 2018 p.7

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In constructing this paper we have also drawn on some key texts, namely:

ESALA Project Briefs for Elements and Assembly 2017-2018

Bill Brewster, & Frank Broughton. ***The record players: DJ revolutionaries.*** New York, N.Y.: Black Cat. 2010

‘A Workshop for..’ Pretend Play and the Quest of the Imaginary User as a Teaching Method

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Abstract

The paper discusses the adaptation of the ‘pretend play’ or ‘role-playing’ concept as investigated in cognitive science and evolutionary psychology in the teaching of the first year architecture design studios. It specifically uses the work produced in the second semester of the first year design studio in the UCy School of Architecture, taught by Christiana Ioannou and Christos Papastergiou between the years 2014 and 2017. The studio asked for the design of a small workshop for an imaginary user, in the old city of Nicosia. In the paper we discuss the ways in which the studio incorporated the processes of the pretend-play in the various stages of the development of the students’ projects and with this the various stages of their initiation in architectural design as first-year students. The research question that the paper pursues is how the pretend play method can affect the students in understanding the context of the project and the various ways in adopting the ‘as found’ approach that has been developed by middle 20th century architects and critical theorists,. The paper seeks to contribute to the discussion about a project-based education of the architect that is founded on the idiosyncratic attributes of each student, does not convey a specific packet of knowledge, but invests in the deconstruction of stereotypes and construction on the distinct ability of each student to build his/her language about architectural design.

Keywords

role play / context / imaginary user / spatial ideas

1. Introduction: Play as an initiation into knowledge

'Μὴ τοίνυν βίᾳ, εἶπον, ὦ ἄριστε, τοὺς παῖδας ἐν τοῖς [537a] μαθήμασιν ἀλλὰ παίζοντας τρέφε, ἵνα καὶ μᾶλλον οἷός τ ' ᾖς καθορᾶν ἐφ ' ὃ ἕκαστος πέφυκεν'. [1]

In Plato's Republic, Socrates advices his friend Glafkon to involve children into knowledge with the use of play rather than to force them into learning. In this way, he argues, it is easier for the tutor to understand the distinct potential of each child. Plato brings forward the role of play into building knowledge, as well as the importance for the tutor to be able to distinguish the special abilities and idiosyncrasy of each student. During the early 20th century the Dutch cultural historian Johan Huizinga and the French theorist Roger Caillois, and, more recently, the Italian architect Alberto Iacovoni, have thoroughly investigated play as a research subject that is able to construct the special place and time occasion for the production of new knowledge. The three views about the nature of play converge to the argument that play potentially creates a space and time frame where a distinct reality applies. Within this distinct reality, all known and familiar things can be deconstructed; distorted and new conditions can be invented by children. This condition that can be called a 'make-believe' is a reality that is agreed and performed between the play participants bearing its own distinct rules, often invented by the participants themselves. The construction and performing of this reality is, for children, an important source and generator of knowledge.

2. Pretend Play, Role Play.

Deconstructing patterns of behavior and performing new roles.

A category of play that this paper wants to discuss from an educational point of view is that of 'pretend play' or 'role-playing'. As in any cases of play, role-playing starts as a convention of make-believe. The difference from other forms of structured make-believe play is that this form of play is linked with the pretention and the adaptation of a behavior. Role-playing means the performance of a role. According to the social-psychologist Erving Goffman playing or pretending a role means adopting a form of behaviour in a specific position. [2]

There is however a distinction between a performer that keeps a certain distance from the role and one that is absorbed and identified by it. The Greek architect and critical theorist Stavros Stavridis, based on the writings of Goffman, Victor Turner and Gregory Bateson, argues that there are two different kinds of roles: the role of mimesis and the role of theatricality. According to Stavridis: 'Mimesis informs behaviour of adjustment'. [3] Mimesis is a form of role-playing that defines a specific kind of bond between the role-performer and the reality that the role constructs. The aim of the 'mimetic metamporphosis', Stavridis argues, is the 'assimilation with prototypes that offer a safe and recognisable identity'. [4] In contrast to mimesis, where the mimetic subject eventually identifies with the prototype of mimesis, theatricality constructs a different kind of relationship between the performer and the performed role. In theatricality, the subject still pretends, acting 'as if' he becomes the object of mimesis, however the subject does not identify with the object of mimesis and the distinction between the two is preserved. Theatrical imitation preserves a

specific time and space frame, and it also preserves a distance, that means a critical stance towards the object of imitation. This renders theatricality a critical process of role-playing between what I am and what I imitate. In theatricality the performer tries to define what he imitates and through this process he learns.

For Psychology, pretend-play in childhood but also in adulthood can offer a process of *catharsis*, that is, a personal and temporary exemption from existing stereotypical models of behavior and ordinary patterns of behaviour. This exception helps cultivate a sense of experimentation for new roles, new assumptions and eventually create new knowledge. As explained above theatricality supports a disguise and not a transformation. The aim of education should not be to transform apprentice architects into formal architects, by providing them with a knowledge pack, but to help each architectural project to build a frame within which he would be able to pursue knowledge.

3. Role-Play: A Teaching Method

Role-play then can be seen as a condition that creates a meaningful frame. Within this frame one can adopt a new role and have the freedom to deconstruct pretentious or unoriginal knowledge and stereotypes. The first task of our studio was to provide the students with a list of characters, containing existing or imaginary disciplines and skills that are only indirectly linked with architecture, such as: Archaeologist, Acrobat, Collector, Explorer-Wanderer, Janitor-Technician, Inventor-Research Scientist, Spy, Gastronomist, Botanist, Hydrologist, Geologist, Hoarder and Tightrope Artist. We asked from the students to adopt a character in teams of two to four and start building the role of this character like a theatrical performer would do; by defining his/her professional qualities, interests, obsessions, specific point of view. They should also define the means that each character should use, according to his/her discipline or area of interest. The students should use these means in documenting the site, assessing what is important and what is not and generally understanding reality in the character's own terms.

The aim of pretend-playing the different disciplines was to help students create a distinct time and space frame, a cognitive frame that would set the student outside the familiar, the known and some times, the real. The creation of a frame would help the students to create a distinct point of view, a way of seeing at things and interpreting reality. This point of view should stand in parallel to the familiar and formal patterns of understanding reality and create a critical stance towards reality. This critical stance towards reality opens a way of generating new knowledge. The student learns how to systematize learning from the beginning without having a pre-determined system. Being able to understand different points of view, being able to understand the various roles of architectural design and thinking and how they are related with other disciplines is the foundation of interdisciplinarity, which was also an important aspect of architectural educations for this studio.

4. A Worskhop In.. and a Workshop For...

Role-Play, the Context and the Seek for the Imaginary User

4.1. A Workshop in... The Role of Context

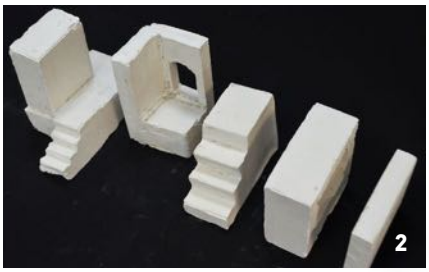
'What ever Space and Time mean, Place and Occasion mean more. For space in our image is place, and time in our image is occasion'. [5]

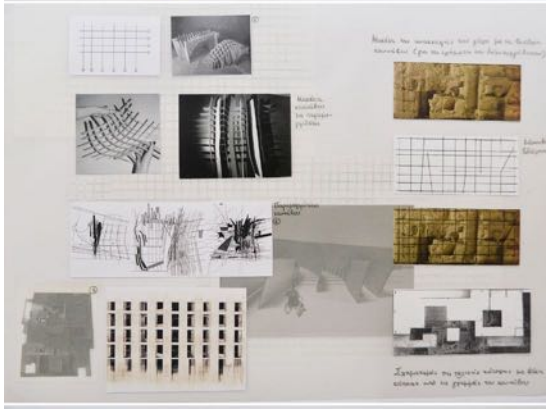
With this argument the Dutch architect Aldo van Eyck argues for an architecture that favours the creation of a distinct time and space frame which is expressed by the specificity of place and the particularity of the occasion. For the studio this was an important critical argument about architectural design. The importance of specificity of place and occasion was expressed in the work and critical thinking of architects such as Alison and Peter Smithson, Aldo van Eyck and the other members of Team 10. These architects promoted the idea of the 'as found' approach, wchich meant acknowledging and using the existing conditions of the site. Architects that followed, such as Colin Rowe, Robert Venturi, Denise Scott-Brown, Alvin Boyarski, Reyner Banham, Colin Rowe, O.M Ungers, as well as artists such as Nigel Hendrson and Eduardo Paolozzi, developed even further the 'as found' approach building the 'contextualist' and 'learning from' critical approach.

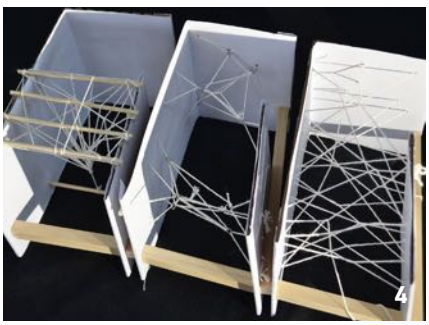
The role of context was a very important part of the studio's philosophy and became part of the studios methodology. We were interested into how the role-play method can develop the relation of the students with the context. Could role-play help students develop various kinds of relationships, and various kinds of relating with the site and learning from the site? For the purpose of this studio we chose the old walled city of Nicosia as a field of action for each team's discipline. The old city offers a rich context in layers of history, materiality, textures, conditions, stories, people, and professions. As an objective of the project we proposed the creation of a workshop. Workshops and commercial shops were historically an important part of Nicosia's urban life. Carpenters, blacksmiths, shoemakers, textile merchants, jewelers as well as Greeks, Turks, Armenians, Jews, Levantines and other ethnicities all coexisted in a common market and this economical coexistence was able to keep balances and maintain peace for many centuries.

4.2. A Workshop for...the Quest for the Imaginary User

In the second phase of the studio each student had to continue on his/her own, choose a user and develop the role of this user in the project. The personal role could be an extension of the group discipline, or related with it, but not necessarily. The personal role could have a theatrical expression, for example the acrobat students would perform acrobatic acts on site that they would later document in notations and panoramic collages or videos, or the researchers would perform experiments and tests that they would document and asses in drawings, diagrams and collages. [Fig. 1] Each student had to create a knowledge about the persona that would occupy the project, his/her daily programme, timetable of work, specific needs, tools that he/she uses, or even his/her obsessions. The students had to construct a narrative, a story about this character. They had to know all the details about him/her and this knowledge helped them later to develop the specific aspects of their project.







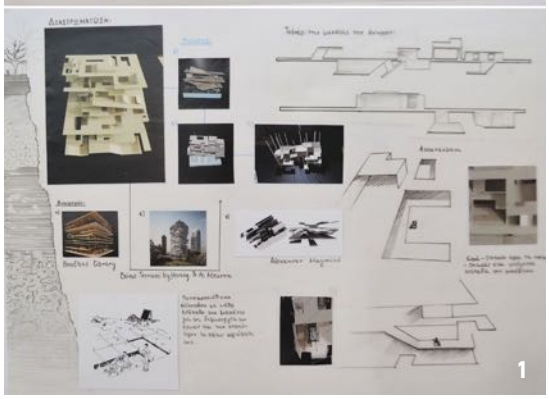


Fig. 1: Working on the role of an Archaeologist. Scenario, means, basic spatial concepts. Eirini Kleidara, 1st Semester, School of Architecture, UCy, 2014

Fig. 2: Team Spies. Styliana Kalapaliki, Kyriaki Erakleous, Despoina Kouppa, 1st Semester, School of Architecture, UCy, 2017

Fig. 3: The Vigilante's workshop, Kyriaki Erakleous, 1st Semester, School of Architecture, UCy, 2017

Fig. 4: The Pigeon Breeder's workshop, Andreas Papaefthymiou 1st Semester, School of Architecture, UCy, 2016

Fig. 5: The Pigeon Breeder's workshop, Andreas Papaefthymiou 1st Semester, School of Architecture, UCy, 2016

5. The Stories: Pretend play and the interpretation of context in Five student projects.

By assessing the work after this circle of four years of running the studio we found out that one of the most interesting part of the studio was the way that the process of role-play, of adapting the role of a character, has developed for each student a particular way in understanding the context, reflecting and interacting with it in each project. For the purpose of this paper we will discuss four student projects that apply the role-playing method in a different way, resulting in different ways of acknowledging, understanding and using the context of the site in their projects.

5.1. Story #1: The Vigilante

The first year students, which are often in their late teens, are keen in adopting roles coming from teen sub-cultures like superheroes, outlaws, musicians, and literature or cinema protagonists. They engage with these roles, they feel more familiar with them and draw them from a pool of references that they have enjoyed and shared with their peers during their school years. They also often possess a great deal of original knowledge about them. One of these students, Kyriaki [6] was part of the team *Spies*. In the first phase of the studio she documented in her site-analysis parts of the site that would be of interest to a spy: hiding places, entrances, openings, passages. She invented means that a spy is keen in using when documenting a site like notebooks, journals, photo collages, reconstruction of scenes in models, alternative means of communication, decoding hidden messages. [Fig. 2] In the second phase of the studio, she selected the Vigilante as a user of her studio. At the same time she selected an old building from the early 20th century now abandoned as the site of the project. The Vigilante is a personality found mainly in comic books and cinema dedicated in protecting an imaginary city, and his/her identity is most of the times hidden in order to protect his/her action. The role that Kyriaki chose could take advantage of the work she had already developed as part of the team spies and elaborate further to the spatial qualities she discovered. By acting the role of the vigilante she was aware that the main part was to elaborate on the paradox of his double life; the hidden and the public. She also had to develop a very specific programme in order to respond to the vigilante's very specific daily needs: a place to hide a vehicle, a place to keep and develop his gear, a place to dress and undress his uniform, a war-room, an observatory to watch around the city.

By performing the vigilante, the student had the opportunity to investigate important architectural qualities in an indirect way, like introducing new programme to an existing building, investigating the relationship between the public and the private, between the condition of seeing and being seen, the relationship between shadow and light, between the old and the new. The context in this project was mainly the old building, offering specific restrictions, and her interventions managed to deal with a typical case of integration in an existing historical building, without however having to know or follow the typical rules of integration in heritage. Our discussions rather focused on the very needs of the user to preserve the building, to use it without affecting its existing condition, to introduce a new

use that could be hidden or at least discretely coexist with the old structure, all of which were needs that were related with the specific role. In this way the role of the vigilante produced original knowledge about a case of intervention in a historical building, without falling into a mimesis of a typical case of heritage preservation. The student in the role of the vigilante invented or discovered her own rules of intervention without having to follow faithfully a role of restoring architect. [Fig. 3]

5.2. Story #2: In the Air

Andreas [7] was part of the team that in the studio we called the prosthetists. This team was expected to develop and perform an interest in objects and structures around the old city that are added and attached to main forms, volumes and structures. The team documented structures that were lightweight, that could be detached, transformed or could be moveable, like infrastructure, tanks, ladders, tents, antennas and fences. During the site-analysis his team perfectly tuned with the role of a person who is obsessed with lightweight structures. They started detecting light weight structure everywhere in the city and trying to understand their structure, their role, and the way they were attached to main structures. By the end of the first phase of the studio, the team had developed also a way of documenting lightness, movability and reversibility of these structures, by the use of diagrams, drawings, collages and models. They created a collection of types that could unfold, attach, extend, and slide on buildings, their facades, terraces or voids between buildings.

This team offered to the specific student a platform to surface his deep interest in light-weight structures. His interest was not pretentious not trying to imitate existing structures, but was rather an intuitive understanding or feeling of the dynamic balance between the different parts of the structure. The user that Andreas chose for his workshop was a man who breeds pigeons in order to collect their faeces and recycle them into fertilizer and fuel. Pigeons, like crows are among the traditional residents of the old city. The student developed a deep interest about this category of birds; how they would nest, how they could pair, were they would eat how they could approach the structure. The discussion during tutorials and presentation moved from very soon towards the world of tensile and compressive stress, but also materiality of structures and dynamic, instead of static coexistence. [Fig. 4] His project unfolded in the air in a void between buildings in the old city. His role as a bird-keeper was only an excuse about his interest in pigeons, as a user of the specific context, that is usually overlooked and that however develops a very specific relationship with the city's voids, terraces, unused and inaccessible parts. In his project, and from the point of view of the pigeons he developed a way of understanding the city from above or in-between the buildings. [Fig. 5]

5.3. Story #3: Landscape of Decay and Transformation

The freedom to undress and get rid of the pre-conceived roles, offered a profound sense of freedom to some students. There were students that became obsessed with a role; they were personified in this role. This was the case of Andreas [8] who started the studio as part

of the team Researcher-Scientist. Andreas during the first phase was absorbed by his role as a Researcher, and dedicated his time in a meticulous documentation of the findings of the researcher, by producing maps and catalogues of the herbs and plants in the old city. [Fig. 6]

The role of the Researcher mainly relates with the means of performing research, and one of these means is the experiment. For that reason we guided Andreas to invent and perform some experiments. He chose to start by documenting the natural decay of plants, as this was his main field of research. Later he continued in experimenting with decay in other materials, like paper and polysterine and manipulated decay by using artificial interventions like fire. He documented plants rotting, as well as books and layers of paper burning and pieces of polysterine melting trying to trigger decay. [Fig. 8] His research in decay has soon gave its position to an interest in transformation. As a role for his workshop user he chose that of the Alchemist. Carried away by his intention to transform materials Andreas investigated thoroughly the historical references about alchemists and their contradictory role as predecessors of Chemistry. [Fig. 7] His research in rotting, burning, decaying and eventually transforming was followed at the project phase by a meticulous research in the transformation of materiality. His Alchemist had very specific programmatic needs, spaces to collect material, spaces with high temperatures to melt and transform objects, the secret space where he would keep the philosophical stone. [Fig. 8] He would also need accesses, exhaustions for the smoke, places to collect new material or places to store the excavation material. All this process of excavating, deposing, transforming became his very project. At the end of the transformation process that was his project, the site that he was working on took the form of with an underground network of caves, a surface with cavities and extrusions, and chimneys providing the area with new landmarks. [Fig. 9]

The student was obsessed with the personality of the Alchemist and his ability and craftsmanship to transform matter. His project became this obsession by transforming the matter of the site into a dreamlike, lyrical version of the site by using some of its qualities. This is an example of a student that obsessively identified with the role and created a frame of understanding the site that concluded in the transforming the site by using its own materials and detaching it from its surroundings. We didn't consider this a dissociation with the context but rather a creative transformation of it by its own means.

5.4. Story #4: Obsession with an idea

Hoarders are called the persons who have the habit of excessive acquisition and are unwilling to discard their collections of things. This habit is often considered as a behavioural disorder, as it often takes the form of an obsession and often results in dysfunctional domestic life or distress as it results in chocking full living spaces. Aristofanes [9] was part of the team of hoarders. This team had to develop an interest towards the objects and materials that one can find in the old city, as well as the ways that these materials are stored, stocked and hoarded. They documented various categories of objects, like wooden boards, construction materials, workshop residues and garbage. They documented the places where they found them and the way they were stored and stacked. The team discovered that the old city hosts a big amount of 'informal' materiality, that consists of the stored or discarded things, the

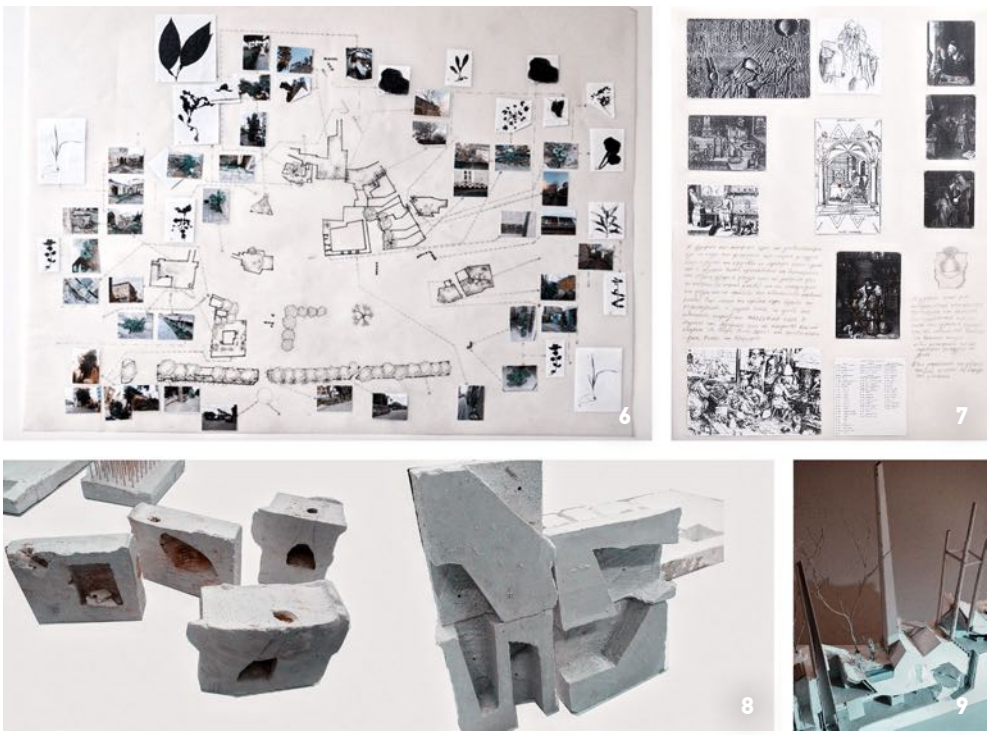


Fig. 6: Mapping the Herbs in the old city, Andreas Panayiotou 1st Semester, School of Architecture, UCy, 2014

Fig. 7: The Alchemist's Narrative, Andreas Panayiotou, 1st Semester, School of Architecture, UCy, 2014

Fig. 8: The Alchemist's workshop, Soil transformations, Andreas Panayiotou, 1st Semester, School of Architecture, UCy, 2014

Fig. 9: The Alchemist's workshop Andreas Panayiotou, 1st Semester, School of Architecture, UCy, 2014

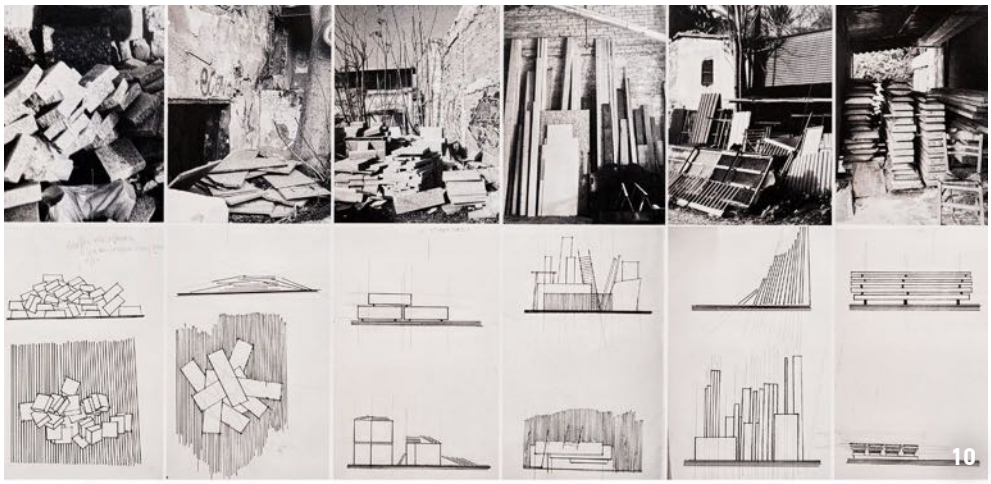
raw materials of workshops and construction works, their products and by-products, their garbage, which stands in parallel to the functional and 'formal' materiality of buildings and infrastructure. [Fig. 10]

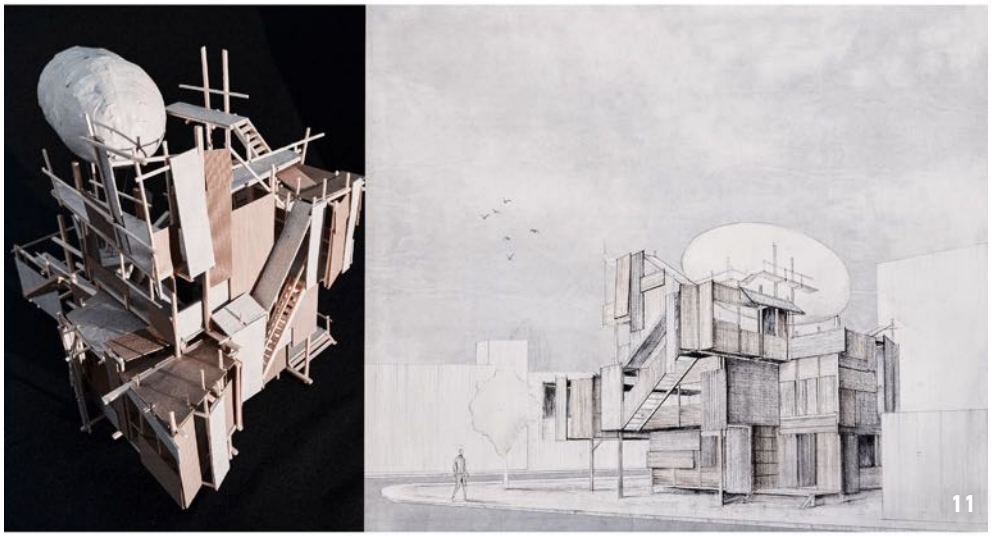
Aristofanes in the second phase of the studio worked on the idea of reusing these materials in new structures with a temporal character. As a user he chose a persona influenced by the Australian artist Daniel Agdag, who designs miniature imaginary machines, such as flying devices and balloons. The narrative that Aristofanes chose was that of an inventor who, like Agdag, constructs imaginary flying machines in real size from discarded material from the area. During his project he defined the categories of materials and their usual sizes and, at the same time, he defined the programme, dimensions, empty-built ratio, number of levels that the resident of the workshop needed in order to build his machine. Aristofanes work is one of the best examples of a role-playing that is clearly perceived as such by its performer. The performer does not identify with the role he performs. On the other hand he identifies with an idea that he rigorously developes through this role. The student was absorbed by the idea that the discarded by-products of the city's workshop and building works, like wooden and stell sheets and parts, fabric and other materials could be used in structures with a temporary character. Aristofanes actually re-discovered in his work a quite old idea, that of upcycling. Upcycling, as the outcome of a process of locating, assessing and re-using discarded material constructs its own relation with the context. [Fig. 11]

6. Conclusion. A Rite of Passage

In the paper we described two methods that the studio used in teaching; the 'role-playing' as a way of engaging students with the object of study, deconstructing their prejudiced idea about the role of architect and architecture and producing new knowledge and the interest in 'as found' conditions as a method of relating the interest and the work of students with the context and its existing conditions. While the 'as found' method was conscious and derived from a specific philosophy about practicing architecture, the 'pretend play' method was based on an intuition that was adjusted and imporved from year to year. One of the purposes of this paper was to reflect on the method of the 'role-playing' and discuss its relation with the 'as found' approach to teaching and how this has influenced the work of students. The result in many cases was a combination of the two.

The 'role-playing' method helped the students focus on the user, the programmatic needs of the project, by building the narrative of the user, his/her daily routine, the needs, the qualities and characters of the spaces he would occupy, the processes of his craftsmanship or investigation. The 'as found' focus of the studio, on the other hand, resulted in the orientation of many students to inventing sustainable activities, building a sustainable relation with the context, inventing or enhancing the local qualities of the site. Each case was an opportunity for discussing important architectural concepts and relations, without putting the students in a position to imitate specific set of rules or perform a predetermined role. Although each case can be considered a unique relation between the performing role and the context, we have detected some categories as an outcome of the combination of the two methods.





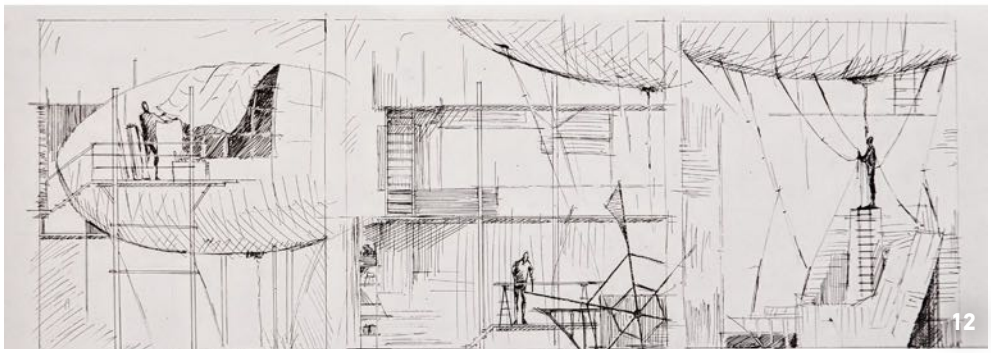


Fig. 10: Team Hoarders, Panayiotis Liasi, Anastasia Psoma, Aristofanes Hadjicharalambous, Valsamos Papagouras, 1st Semester, School of Architecture, UCy, 2016

Fig. 11: Daniel Agdag's workshop, Aristofane Hadjicharalambous, 1st Semester, School of Architecture, UCy, 2016

Fig. 12: Daniel Agdag's workshop, the narrative, Aristofanes Hadjicharalambous, 1st Semester, School of Architecture, UCy, 2016

In the first category belong the projects that develop a sustainable relation with the site and enrich its qualities, the local character of the site or generally the context of the old city. The appreciation of objects found on site, the recycling or upcycling of objects from the site, energy production that is offered back to the site, processing of materials such as plants or food that is produced on the site, processing of water, providing access and taking care of a special area. This category host roles that develop a productive relationship with the site.

In the second category belong cases of students that invest much on the role-play and build the project on a specific personality, either a historical one, an existing one, or even an invented one and built the project on this personality. This identification with the personality they perform renders the project a personal matter. The projects of this category usually develop an obsession with a role, that leads to a highly theatrical approach to design. The context then becomes a filed for experimentation although it remains a concrete substance that provides specific qualities. In many cases the site is subject to total transformation or lyrical re-evaluation.

There is also a third category of projects that manage to find and enhance existing uses by providing them with new perspectives. These projects often build the role of the user on an activity, one that already exists on the site or an invented one that relates with the site either historically or as a character. In this category the role-playing becomes attached with the investigation of the specific process, the routine and the programme of the activity. In each case the means that the students used played an important role. We refer to means for mapping the site, cataloguing findings, analysing spaces that were related with the various disciplines that they performed in the first phase of the studio; storyboards, narratives, sketches, diagrams, paintings, photo collages, devices. These means that they discovered for documenting the context in the second part became means for inventing space. The choice of means and their combinations reflected the role that each student chose and the understanding and interest that he/she developed about the context.

The different ways of approaching the projects, the means they use, the attachment to their role, the construction of the users personality are part of the complexity of this transitional phase that the architecture students suffer in their first years of study. The British cultural anthropologist Victor Turner has argued about what he calls the rites of passage. [10] These are phases in each person's life that define a transition from one state to another. During these transitional periods the state of the person is unstable, Turner calls it a liminal period, because, as he argues: '[...] liminal personae (threshold people) are necessary ambiguous, since this condition of those persons elude or slip through the network of classification that normally locate states and positions in cultural space'. [11] With this paper we argue that the students of architecture are, or should be considered as persons undergoing this liminal period. They are not classified cases as their condition is in becoming, and the outcome is not defined. It is not enough anymore for architecture studies to transfer to the students a body of knowledge and a degree to practice architecture, because many of them will be directed towards other disciplines and practices. This is the peculiarity and interest in architecture as a field of knowledge.

During this rite of passage, all students perform a role. Some identified more and other identify less with it. In this way, some use it as mimesis, and others more theatrical. By observing the various cases we wouldn't say that identifying less with the role is something positive and identifying more acts negatively to the student's development. We believe that the aspect that helps to identify how a project has helped a student to connect to his/her original interests and intuitions is the narrative that he/she builds along the definition of the role. The specificity of the narrative of the role defines also the specificity of the knowledge produced during the project. The specificity of the narrative also defines the specific relation that the student develops with the context, which is among the most important objectives of the studio. The investigation of the narrative as the part of the role-playing that connects with specific architectural qualities, such as the programme, is something we intend to pursue further in the future. [Fig. 12]

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Educational Modalities

'Proyectos Zero': Activating Communities of Practice to Welcome 1st Year students

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Abstract

Proyectos Zero is a pedagogic experiment that has taken taken place, since 2011, in the first year design course in the University of Alicante, Spain. As I will show in this paper, it has become one of the pillars that explains our pedagogic model reinforcing and bringing it forward. From the beginning, the course involved young architects as tutors to introduce new students to architectural design and to the school. The historical conditions of design teaching have led to understand the course of design as the one integrating the disparate knowledges acquired in different courses. The Bolonia Process though, introduced design in first year offering the possibility of an autonomous course with its own content: one that aims to emotionally mobilize the students and link their subjectivity to a starting formative path in which they learn how to be an architect. From my experience in the course, first as tutor and, after some years, as coordinator, I explore the implications of that content for the structure of the course and the relations between the school and the community. Relying in Lave and Wenger's idea of a community of practices, I understand the tutor as an intermediate figure between the new come student and the teacher, key for the success of an experiment that lies deeply in their presence: instead of objective contents and abilities, we have affective and subjective ones that come into the teaching room along their tentative steps in the architectural community of practices. Thus, the pedagogic space of design turns into a space of creative undergoing for all people involved into recreating, and thus make anew, the whole of the community of practices of architectural design.

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1. Introduction: 'Proyectos Zero'

Alejandro de la Sota said: "I believe in the conviviality with the one who knows, more than in his teaching. Institutionalized teaching does not seem so effective. Better when one searches, finds, lives together with the master" (García-Solera, 2000).

Proyectos Zero (PZ) is a pedagogic experiment that has taken taken place, since 2011, in the first year design course in the Architecture Degree in the University of Alicante, Spain. Leaded first by J.M. Torres Nadal and E. Nieto, other teachers have taken on the experience through the years and it has become one of the pillars that explains the pedagogic model of Alicante School Design Teaching. From the beginning, the course involved young architects as tutors that would introduce the new students to architectural design and to the school itself. First, they were tutors trained in the same University of Alicante and, after some years, the call was opened up to other universities too.

I have participated in this pedagogical experiment in different roles. In the first year of the experience, my business partner Alfonso M. Cuadrado and I took part as tutors of a group of sixteen students. After that, from 2015 to 2019, I was one of the coordinators of the course together with different colleagues. In these years, the course has changed a lot, trying to maintain the spirit of the first call, while adapting to different challenges posed by administrative issues or socioeconomic circumstances.

As Nieto has explained, the special historical conditions of architectural teaching in Spain had led to understanding the courses on design as the ones in which the students would integrate the disparate technological, theoretical and cultural knowledges that they acquired in the other different courses every year. The Bolonia Process, though, introduced, since 2010, one semester design course in first year, when those knowledges were not still acquired, offering the possibility of developing further the previous intents carried in Alicante of teaching design as an autonomous course with its own content (Nieto 2012,84/421).

In 2011 when explaining the course to the new tutors, teachers Nieto, Torres Nadal, and Sánchez Morales defined the course as a different course, and its content as something more like an initiation, more related to desire than to techniques (Nieto et al. 2012). In what follows I will explore the implications of having 'initiation' as a university course content.

2. Initiation as the course content

In texts about architectural projects pedagogy in Spain it is common to find the quote by Alejandro de la Sota, one of Spain's Modernism heroes, with which I also started this text (see for example Aizpún 2011,36 and Carcía-Hípola and Hevia 2015,233). The reference seems to come from a very personal text by architect, and former Alicante design teacher, Javier García-Solera (2000). In it, he tells about the hours spent, in his childhood, by the side of his father who was one of the most important local architects in Alicante since the fities. He argues that it was sharing time and experience with such a master what made an architect of him. The idea of convivial initiation is very successful in the pedagogy of architectural

design. According to Iñaki Ábalos, a Spanish architect and former Chair of the Department of Architecture in Harvard GSD, this is precisely the role of an architectural design course: to share an attitude, to teach how to be an architect (quoted in Alba-Dorado 2016,447).

But how exactly is it to be an architect? One of the foundational tropes of the school of Alicante is that a student, just for the fact of wanting to become an architect, will be treated as if she was already an architect. This trope is called among us the 'actor-student', after an internal text by Torres Nadal (which is commented in Nieto 2012,359-362). By this principle, the student's experience of living in the world is understood as an experience that has the potential to be architectonic and thus, redefine what the teacher thinks that architecture is.

Through my experience in teaching in PZ, I will try to explain how this pedagogic experiment brings the actor-student principle to a new way of understanding the teaching and learning of design that is not about an individual student but about the whole community of practices of architecture.

3. Sharing desires and uncertainties

When we were first asked to teach PZ in 2011, Cuadrado and I had just started our own practice. The year before we were licensed as architects in the middle of the crash of the building sector, when architectural services crashed too and commissions were not the conventional ones, if they were at all. So for us, the question of how it is to be an architect made a lot of sense. Our proposal for the students was to try to respond to it as actor-students. Now, looking back at our brief and the weekly exercises (see Gisbert and Cuadrado 2011), I can see how they set up for the students an experience parallel to the desires and uncertainties that we were experiencing. Starting from an exhaustive description of a place in their close environment that had lost its use and become obsolete, each student did a series of exercises to re-signify that place through a design project. In our newly opened practice were also working in obsolete places, in the middle of a territory who had been rapidly urbanized by the forces of tourism through a building boom that, once crashed, made the architecture that had drawn it to loose its use.

The designs developed by the students happened in their home towns or neihgbourhoods or even, their family houses. One student worked in the terrace of the building where he had learnt to play music with the local marching band. Other student prepared a participatory workshop for rethinking a derelict street and built a community garden with a local NGO. And yet another built a portable cabin in her grandfather's tractor to observe and share shelter with wild animals that were gaining terrain to cultivated nature. The final presentation was a two day trip to visit all this places. But to take part in the collective jury at the school of architecture, maybe as a closing manifesto, Cuadrado and I, both children of local farmers, borrowed the truck to carry the harvest of watermelons and artichokes. Parking it in the middle of the campus, we built up a pop up cinema to show not the projects but videos in which the students explained their projects, funnily dressed up as imagined architects that had specialized in the kind of projects they had developed.

4. Remaking architectural vocational stories

For us, it was very important that the students understood that their design project had grown from the same ground they had been brought up in. And that this ground had the potential to redefine architecture opening a diversity of formative paths that they could pursue in the following years. Our review of the work was to propose them a reference similar to the architect they had invented as a prototype. To Sole Rico, the student that had designed the cabin, we pointed to Natalie Jeremijenko, a designer working in technological interfaces that can communicate humans and non humans.

Some years after, I met Rico presenting her Master's Final Project (TFM) and she told me that she was still doing the same project again and again. In fact, she did it again when she was a PZ tutor in 2017 and she still continues doing it: I just checked she has won an entrepreneur prize for a start up that designs and builds experiences in nature in overlooked places (Sala 2018). With this, I do not mean to overstate our influence, as these topics are common now in design and other teachers are working on them at the school. Neither I mean that this is an answer to the crisis of architectural career paths. It might happen that this business does not work or that changes in time.

My point is that, whatever architect she is at any moment in the future, when asked about a vocational story, as the one I referred from architect García-Solera above, she will be able to invoke her childhood in her father's farm as what taught her how to be an architect. The actor-student principle, when brought to its consequences, redefines the kind of environments that can offer an architectural education. Now it is not only the architect master's workshop, but also a farm in the interior of a touristic coastal territory in the Mediterranean.

In what follows I will try to show the potential for this pedagogical experiment not only to change the formative and professional path of an individual student but of the whole discipline.

5. An organized experiment on differentiation

The actor-student trope and, in general, design teaching in Alicante is inspired by the proposal of philosopher Jaques Rancière (Nieto 2012,421). But PZ, more than any other course, is based in the interaction between ignorant teachers and the inexperience of students at university. It was specifically meant to be a course without drawing, as we could not anticipate if first year students had this skill. Students designed through installations, interviews, performances and videos. Several other tutors worked like that too, and this has become common in PZ course. Each tutor tries to explain the legitimacy of these exercises differently. As first year students might not see yet how making a performance, producing a musical video, or interviewing a neighbour in his town, can be considered an architect's job. As a shadow, it appears a prototypical figure of an architect. Either to deform it a bit or to present it as something to react against.

According to architect and theoretician John Habraken, this happens because we all share a professional lineage whose prototypical figure can be traced back and is best represented

by Renaissance architect Andrea Palladio. He was the first architect to publish his own ouvre in his lifetime, and this publication set the canon of how we still represent ourselves. For Habraken, as a community of practitioners, we are Palladio's children and though we might deviate from that figure in many ways, we still inherit a lot of his ways of working (Habraken 2007).

The first year of the experiment, in 2011, most of the tutors in the eight groups of teaching had been working for several years professionally and many of them had founded their own practice, which they were making public very much like the mentioned Palladio's children. In 2015, when I was related again to PZ as a coordinator, it became so difficult to find tutors with this profile that they were, instead, last year students that had excelled in their PFC. This evolution of the tutors profile from 2011 to 2015, is related to the decay in society's interest in architecture. The lack of jobs and commissions could be felt in our own environment as architects our generation, friends and colleagues, emigrated abroad to work or found other career paths. This also influenced students career choices, as it can be seen in the record of preuniversity marks students needed to have to register in the grade, that in 2013 had descended to the minimum ever.

When I started coordinating the course in 2015, I could hear students asking the same questions they had asked five years ago about the deviations from the prototypical architect that they had in mind when they registered to study architecture. For these tutors though, it was more difficult to respond to them than it seemed to be some years ago. To help with that, I put a lot of effort in multiplying the days of gatherings of all groups of students. Those days, the student realized that her tutors' way of doing architecture was just one among many possibilities. Putting together many differences was one way of legitimating their presence on the classroom and the deviations from what it was expected. Those days, the student realized that her tutors' way of doing architecture was just one among many possibilities.

6. Legitimate peripheral participation

At that time, I thought that this had to do with having less of a professional experience that could be brought to the classroom. But, at the same time, that contradicted our own experience of having taught when we were just starting the practice. When asked about this, my teacher colleagues agreed that if we have had older teachers, with more experience in the professional world, they would not have been able to correspond to the students expectations in an initiation course in the same way. In the discussions about the topic it is agreed that the success of the experiment lies deeply in the presence of these young tutors. At the university, this presence is fragile and precarious and yet, when we were tutors, we felt as very empowered.

I have come to understand the tutors position through the work of pedagogists Jean Lave and Etienne Wenger on communities of practices. Their proposal for understanding 'situated learning' resonated with my experience in PZ. For them, learning takes place in particular kinds of social engagements, through legitimate peripheral participation (Lave and Wenger 1991).

If we understand this intermediate figure of the tutor through their lenses, we see that legitimation does not lie in a secured position in the university or in having more professional experience outside it, but in the relations established between the three figures: new students sharing time with those who are in the precise moment of trying to become architects in their very own terms but also to become full participants on a community of practices that includes older teachers. Everyone is emotionally mobilized, because all of their roles and practices are moved by each other.

Precisely because the tutors have limited responsibility in the success of the student's achievements, they both learn from experimenting what architecture could be. For this to happen, there is a tacit agreement between tutors and coordinator teachers: PZ is a course in which all students pass as long as they have actively attended the course. The role of the teachers coordinating and supervising the course is to assure the tutors the freedom to propose how architecture should be taught and to take charge of the responsibility on the results of that experience, whatever it is. This is to ensure that learning occurs "under the attenuated conditions of legitimate peripheral participation" (Hanks in Lave and Wenger 1991,14).

There is a saying in Spanish, if you want to learn, teach. The results are unequal if you see them as proper products of design. But highly valuable in terms of the mobilization of the person in the community of practices. Tutors invest themselves so much in what they are teaching because that bridging is also what they are trying in their own lives. There is no given or tested way of working. But even if it was, for the tutors is experienced anew. The affective and subjective contents and abilities that PZ aims to develop come more naturally into the teaching room along the life paths of the tutors. This is why the students start to link their subjectivity, their life, into their starting path as architects.

7. Conclusion: a community of learning

The two following years that I coordinated the course, instead of looking for the most successful TFM students, we opened a call for tutors that were in that very professional moment of starting a practice. For that, we needed to look for tutors that had studied in other schools too. In the second iteration, in 2017, the emotional link was so tight that, when we did our last gathering at the end of the term, students engaged in a fierce debate in which each of them would defend their group's way of working as a better career option than the other ones. Both the students and the tutors had become so invested that for the following year we thought it better to have some kind of shift from one group to another so they experienced in their own flesh more than one possible career start.

In this last year edition, with Nieto and Sánchez Morales as main coordinators, I helped to organize a course in which the students were separated only in two big groups, taught one in the morning and the other in the afternoon. Each tutor, alone or in pairs, spent two weeks with them, pursuing an exercise that was part of their starting professional practice and also gave a lecture about it. The continuity was given by the topic: a series of interventions in the coastal town of Torrevieja, in Alicante, that helped to cover the cost of having again, as in the first year of PZ, eight different tutors that came from different cities and schools.

In our first experience as tutors, PZ was an extension of the actor-student principle to our first experiences in the world of architectural practice. After that, as coordinator, I set the stage for first year students, with all their impatience and uneasiness about what architecture is, to meet and work together with first time teachers, also with all their impatience and uneasiness about trying to share and, at the same time, gain a self understanding of the way they intended to practise architecture. This has many implications for the content and structure of the course that have been explored in this text, but also, for rethinking the relations between the school and the community of practices: PZ allows for tutors to bring into the school the reality of professional practice, but differently from the way more experienced teachers would do, they do it in a tentative and playful way. What is shared between students, tutors and coordinators is something that is not totally predefined and, though it shares and refers to ancient archetypes of how is it to be an architect, it emerges in new ways from the encounter of these figures.

The fragile presence of the tutor, a new come to the professional community of practices, extends the transformative potential of the actor-student from the classroom to the whole community of practices. For the student, it was a means to open a pre-given definition of the design course through the biographies of students. But for the tutor, it has the potential to redefine a pre-given definition of the profession. The pedagogic space of design turns into a space of creative undergoing (Ingold 2015) for all people involved into recreating, and thus making anew, the whole of architectural design, from education to practice. This brings the scope of the principle of the actor-student further as, according Lave and Wenger, it puts the practice itself in motion (Lave and Wenger 1991,116).

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‘A Movement Towards the Primordial A of Architecture’.

A pedagogical program on human nests - habitable spaces for an elementary class of 10 year old children

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Abstract

A series of 18 experimental courses took place during the school year 2018-19 in the public elementary school of Kareas, Athens, Greece. Every week children of 4th grade participated in pedagogical activities related to architecture. The term “architecture” was intentionally substituted with the commonly recognizable terms “habitat” – “I make space Inhabitable” – “I inhabit”, that have to do not only with human life, but also with the lives of all living creatures. The aim of the program was to define, in contemporary terms, the meaning of human living space and accordingly the basic meaning of architecture. For this purpose, the archetypal need of “entering inside” was used as a common denominator in all meetings and construction activities that children participated in. The innate sense of “self –protection” was investigated in a series of known animal and human creations in direct relation to “inhabitation”. The A of architecture is related to this primordial sense. Children groups made sim-

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ple shelters (by using chairs, tables, fabric and cardboard) during an imaginary excursion to a forest. The size of each shelter was big enough for two children to enter inside. Later on, these (1:1 scale) shelters were composed and modeled in order to form a small camp for children. Streets, squares and lanes were added. The "young architects" learnt the importance of co- inhabitation. Classroom sessions were accompanied by visits to archaeological sites and the new and old neighbourhoods of Kareas. Special activities, such as "sound games", were added. In the end, children participated in the design and construction of eight wooden sheds, which were used in public festivities. The paper contributes to the conference theme by introducing a specific pedagogy not only to those who may create architecture, but also to those who inevitably will live in it.

1. Introduction

When exactly does architectural education start? Is it certain that the first year of architectural education necessarily takes place in a university or a polytechnic school at the age of 18 (or so)? We believe it starts way sooner. Its roots reach our early years in life and have to do with elementary needs, skills and conceptions that affect all human beings. The question is to define these elementary values of architectural education or architecture in general.

There is a gap (at least in Greek society but also in other parts of the world) between what is generally considered as "architecture" and what architects tend to think on the same issue. The realization of this gap led to an initiative aimed at defining and clarifying fundamental values of architecture that are inherent or can be taught and realized by all people, even children.

The "A of architecture" is a movement whose goal is to incorporate architectural pedagogy into the public educational system of Greece. For this purpose, the past few years (since 2017) texts have been published on this issue, and a conference has been organized. The latest action of this movement was the organization of a series of 18 experimental lessons that took place during the school year 2018-19 in the 9th Public Elementary School of Kareas, Athens, Greece. These lessons are the subject of this paper.

The idea behind these lessons was to introduce a specific pedagogy that involves not only those who may create architecture, but also those who –inevitably- will live in it, i.e. the inhabitants. Architecture was not primarily considered as an aesthetic issue or a constructional subject (irrespective of how important these are) but basically as a "vessel of life": as a place where people spend their lives [1]. As a matter of fact, and because of the importance (and gravity) of the term, the word "architecture" was intentionally not used from the beginning. It was substituted with the commonly recognizable terms, "habitat" – "I make space inhabitable" – "I inhabit", that have to do with the lives of all living creatures. The A of architecture is related to these primordial notions.

The aim of the program was to define, in contemporary terms, the values and characteristics of human living space and accordingly the basic meaning of architecture, the reason for its existence. For this purpose, the archetypal need of "entering inside" was used as a common denominator. In all meetings and activities children were asked to create and realize the importance of being "inside". The innate sense of "self –protection" related to it, was

Fig. 1: Bodily representations of animal nests: A bird's nest –opening upwards and a turtle nest – lifelong carried on the ground.

Fig. 2: Building and living inside shelters.

Fig 3: Playing inside and outside shelters.

investigated in a series of known animal and human creations. “Inhabitation” was combined with the term “nest”, to form the name of the project: “Human nests- habitable spaces”.

2. “Human nests – habitable spaces”: 18 activities

Every week children of 4th grade (age 10) participated in pedagogical activities related to inhabitation. Lessons were organized by a team of architects with the collaboration of the school class teacher and were incorporated into the “Flexible Zone” of the formal school program, a time during which the teacher is free to develop a special pedagogic issue.

Activities took place each time in different locations: In the classroom, the school hall, the library, the courtyard and also in a big hall of the community cultural center called “Urban Center of Kareas”. These places were transformed through child imagination into real or fantastic places: a forest, a lake or a village. Furthermore, special activities took place in archeological sites and urban areas.

All activities are here presented according to general classifications based on their theme and aim:

2.1. The need for an inside

During the first meeting, in order to get to know each other and as a preliminary introduction, in the school hall we made an imaginary promenade in the woods. We felt - using our imagination – dangers we face in nature such as rain, strange sounds, cold, wind or other things that make outdoor living difficult. We also “saw” nests of birds, animals and insects and, afterwards, we represented them with our bodies, so that children could be able to realize the sense of “insideness” created in each nest. (Fig.1)

In the next meeting, in the classroom, children tried to recognize characteristics of each nest: where, why, for whom and how they are made. We realized the feeling of protection evoked by the notion of “inside” and the different ways this is realized by each animal.

The next step was to examine likewise human nests and the threefold: habitation, make space habitable, inhabit. Through a scaled model of a traditional nomad shed, we studied similarities of human and animal nests.

2.2. Creating and studying an inside

Next step was to create a shelter. In the Urban Center of Kareas, we set again for an imaginary promenade in the woods, only this time we had to stay overnight and build makeshift shelters for one night. Child imagination transformed a real hall into a “clearing of an imaginary forest” next to a lake. Children, with the help of their tutors, made shelters out of chairs, tables, cardboard and fabric, big enough to fit 1-2 children. (Fig.2) This activity was common to all children since they were familiar with this “game”. The difference was that the activity took place in a certain setting: A hill, a rock or up a tree, where variations of shelters were created.

Fig. 4: (a) Main street of a settlement made out of paper and gathering space with a fire in the centre. (b) Topographic representation of the settlement made by children.

Fig. 5: Reading drawings and recognition of school spaces.

Fig. 6: Synthetic actions on a model.

During subsequent lessons, both children and tutors represented their shelters in sketches. We discussed the notion of protection, and realized that "we conquer space in the same way that we conquer language: By living inside it" [2]

2.3. Introduction into the notion of co-living

In the following activities we moved on to a bigger scale. We decided to create a village and emphasized on the fact that a settlement is not just a sum of autonomous shelters. The in-between [3] of buildings is habitable space per se. The inside gradually extends to the outside creating an organized entity. Through motion games children realized the difference between random and organized movement. The need for a main street resulted as a necessity. At the end of the street we created a gathering area for all people to meet each other. (Fig.4) The fact that movement was not dispersed resulted in the protection of the rest of the forest.

2.4. From imaginary to real contemporary architectural space

During the next meetings, we decided to study a real architectural space: a building that is familiar to children since they spend their everyday lives in it. We set our school building (the 9th elementary school of Kareas) as a reference point of our lesson. The young students were asked to choose their favorite space and draw it. The notion of representation emerged. Furthermore, through large scale drawings of the school, they learnt to read drawings of their school and recognize the spaces inside them. (Fig.5) Students learnt the difference between section, plan, elevation and perspective drawing.

The school yard, entrance and library constituted "lessons in themselves". Children were asked to describe their activities during breaks and realized that each space creates different opportunities for a variety of activities. They were called to recognize the corresponding spatial qualities that we discussed in the imaginary woods: the central gathering place, the main axis, the entrance, the classroom-shelters etc.

Parallel to this, they realized the difference between open and closed, centre and periphery, movement and pause, sunny and shadowed areas. Through sound games in different areas of the courtyard they realized that the "inside", even if it is outside, amplifies their voices and enhances the potential of communication between them. At this pivoting point we started using the word "architecture" for the first time: Architecture is behind a building's function and form and the task of an architect is to make space habitable.

2.5. A synthetic exercise: Creation of a holiday camp in an imaginary clearing

In order to realize the different aspects of co-living, during the last weeks we designed a holiday camp for children, which was represented in a large-scale model (1,5x3m). Students were called to discover the needs of a camp and accordingly decide where to place houses, streets, squares and essential communal spaces and buildings. (Fig.6) The already existing five shelters (that children had built in previous meetings) became typological units (forest, lake, clearing, hill, rock) in order to create five relevant neighbourhoods, interconnected

Fig. 7: *Recognition of elementary spatial notions, through music games, in the (semi ruined) archeological site of Vravrona*

Fig. 8: *A lego-like game showcasing elementary architectural structures*

Fig. 9: *Map detection of urban characteristics*

Fig. 10: *Building of sheds. Active involvement and manual work turn knowledge into experience*

through the existing movement network. During the design process disagreements emerged and children had to choose and vote between different options on the placement of specific activities.

2.6. In between special activities

During the school year special activities also took place with a specific theme or scope:

Visit to the archeological site of Vravrona: A living experience of an "ancient school" in the temple of Artemis. (Fig.7) We played games in order to realize elementary spatial notions: Open, semi-open and closed space, public and private, random and organized. Through a ritual of music games, children were introduced to the notion of rhythm and its analogy to architecture: repetition, element (column), pause/void (distance between columns), rooms and central area (enclosure), axis (movement) etc. The incompleteness of the semi-ruined monument strengthened perception of these notions not as finished forms but as abstract qualities.

A myth and a game about the birth of architecture: In classroom, children got in touch with elementary space and man as the centre of architecture: We got in touch with archetypal spatial structures, through an (appropriate for that purpose) transforming educational model [4], that - like a "lego" game - uses elementary architectural components such as column, wall, roof, ground etc. (Fig.8) We discussed the importance of a reference point in human co-existence and learnt about the notions of verticality, repetition, size, scale, proportion, intimacy, grid etc.

A tour into our city (the new settlement of Kareas and the refugee housing complex): In a daily activity that took place outside the school, we walked in the neighborhood of Kareas and, more specifically, in the refugee housing area. We observed streets, squares, housing areas and communal spaces of commerce or recreation. We watched apartment buildings: their height, floors and entrances, the accession and accessibility of apartments (lifts and stairs), their age, their construction materials (concrete, plaster, wood, glass etc.), their colours but also the inhabitant's interventions through sheds, plants and colouring. (Image x). We detected on a map the layout of the housing blocks, shops and communal areas and, through a "treasure hunt" city game, we discovered these qualities in several places within this district. (Fig.9)

2.7. Preparation for a fest. The making of real shelters

As a conclusion to the whole series of lessons, we participated in the organization of a real fest and the creation of its necessary spatial infrastructure. We organized the setting of a community festival (taking place each year), where all local associations meet. Children participated in the preparation of all parts of the fest: Development of the basic idea of a spatial organization, and consequently design and manual construction of sheds for each association. During this activity children learnt about elementary constructional disciplines and got in touch with material properties and characteristics (in this case wood, rope and fabric, provided by the local boy-scouts). This pedagogical but also recreational procedure

turned our lesson into a fest. Children participated actively in it. Manual activity and self-involvement with a real project transformed knowledge into experience. (Fig.10)

During this fest the final presentation of our series of lessons took place in front of an audience of parents, local residents and interested architects.

3. Afterword: An introduction

The series of these 18 lessons has not ended. Currently the team is reevaluating the project in order to produce an analytical recording of it and clarify and strengthen its aims and values. A publication is forthcoming.

For the adoption of the general idea of such a pedagogy by the state it is proposed that an elementary architectural pedagogy should be introduced as obligatory into the public elementary and secondary education (in the same way that this is applied today in music and art lessons). Further on, it could be applied voluntarily as lifelong learning.

Conclusively, the "elements" of such an educational proposal are:

- The need for protection along with the need for communication and co-living and their spatial prerequisites.
- A sense of insideness and the need to make space habitable.
- Consideration of architecture primarily as a "vessel of life", as a place where people spend their lives in.

Our thesis is that if we transmit this knowledge actively, through the direct involvement of students and by expanding their manual creativity, we have some rather important elements for an architectural pedagogy. Such a pedagogy, which is currently absent from some Schools of architecture, could contribute, if embedded to them, in the investigation and understanding of the deepest roots of architecture, the art of habitation. Further on it could be developed, enriched and applied to first year architecture students or all architecture students in general. [5]

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Reconsidering Rituals & Stereotypes

Improvization Unbound: Expunging Stereotypes

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Abstract

A series of misinterpreted notions toward design and architecture appear embedded in the novices' perception, as strong presumptions resisting re-calibration. Stereotypes and conventionalities often limit their attention span, prohibit conceptual exploration and even hinder in-depth experimentation. In the studio, simplistic metaphors and ***cliché*** symbolic connotations act as convenient excuses for post-justification in frequently facile form-making attempts, canceling further zest for design research and even jeopardizing teaching processes. The adverse postulation emphasized here is that, in such cases, understandings of some architectural ***meaning*** supposedly ***inherent*** or seemingly ***self-explanatory*** do prevail, while vague and euphemistic terms, such as the ***harmonic*** or the ***organic*** monopolize dialogues; along with an illusion that a premature incorporation of such notions in verbal presentations allegedly 'validates' unresolved projects and communicates meaningful content instantly. Skills of self-criticism are of crucial importance in provocative approaches and efforts to confront such situations and can be developed through a tutoring tactic named here ***"Impromptu Fundamentals"*** emphasizing a multiplicity of parallel design schemes. Students are requested to work simultaneously on more than one concepts or working processes, giving equal chance to a multitude of schemes that emerge from differentiated or even contrasting design strategies. Students may thus arrive at a final project that is much more the outcome of rigorous self-critical process rather than mutual consent between tutor and student. ***"Conditioning Improvization"*** is a sequence of interrelated projectiles – as siteless self-referential mechanisms based on physical modeling – exploring morphological agendas and design progression. Each consecutive challenge evolves and ultimately expands upon geometric and organizational properties of the previous. Sequential processes emerge in parallel to a clear sense of responsiveness, exposing students to the non-conclusive, ever-evolving, ***'unexact'*** and often non-linear nature of design. Design projectiles develop in conjuction with a lecture-based theory component as surrogate to lacking educational backgrounds in the arts; compensating for poor exposure to cultural histories - an otherwise academic prerequisite for architects

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1. Negating Didactics: Closure Tactics

Paul Rudolph, the legendary post-war academician in the U.S. – with a notoriously hegemonic stint as the Yale Architecture School Dean – has stated: *"There are certain things that are teachable, and there are many things that are not teachable. For instance, you could probably not really teach design. You can clarify what other people thought about design and what it implies, but you can't teach people to be talented. It's an innate thing. People are born architects or they're not born architects. I've seen very intelligent people who will never be architects, no matter how much they try..."* . [1] Frank Lloyd Wright is recorded to have told Paul Rudolph once – during a visit at the Princeton School of Architecture – that *"only prostitutes teach"* [2] challenging the commonly accepted initiatives of our involvement with academia. Meanwhile, Peter Eisenman commonly declared *"you can only teach B students"* – a phrase that myself have also witnessed a number of times personally, repeating that second class students – the less talented yet willing – often prove to be more communicative, able to collaborate and follow teaching approaches. Many more academicians have in the past agreed that architecture cannot be taught, that *didactics* are easily misunderstood as mannerism; that an unmanageable category – that of the talented – remains pedagogically unclassified. [3,4] This context of discourse sets a rather uncanny and controversial background for endeavors introducing design to the incoming class.

1.1. Freshmen for Life: the Polemics of Order

Inevitably, the nascent architectural design studio divulges intense contradictions: on the one hand, as a cathartic act of initiation, could potentially be repeated infinitely, over circular phases throughout the 'bios' and career path of an architect. The inaugural studio embodies insistent challenges for a redefinition of all design hypotheses; as a clear instigation step – baptism of fire perhaps – it questions identities, aiming at re-setting one's creative signature, at regenerating a commencement point. On the other hand, the first studio constitutes perhaps the sole design course that invites a rather *'institutionalized'* approach, attempting almost surgically, systematically and profoundly to eliminate previous convictions and conventions toward architectural space. Therefore, pedagogically, its role, significance and impact may be considered as far greater than all subsequent studios.

1.2. Conditioning Improvization: Reciprocity Unchained

The teaching method adopted in Ioannina for the first semester of study emphasizes geometry and form as the elemental principles and tools of architectural production. Structured exclusively on the basis of textual project outsets, in an absence of image-based references, we propose of an architectural approach that *"can be specified and transmitted by telegram"* – as Colin Rowe once uttered to define 'conceptual design' in the '70's. [5] Each – almost siteless – projectile is handed out as an extensive and detailed list of specifications, avoiding all references to spatial qualities or programmatic particularities. Conversely, each design question poses clear parameters and geometric rules decoded into space by participating students who turn text into form. Rephrasing, every project outset is rigorously announced as a series of exact regulations – alluding to a building code almost, thus advocating an entire

morphological vocabulary, announcing each time novel and unexplored design directives for the freshman group.

The exercises latently reject trivial understandings of *common building* and simultaneously relevant disillusions, thus departing from stereotypes. Each exercise introduces an entirely different design tool-kit, familiarizing students with a wide range of geometric problems. Physical modeling, a rather uncanny tool for first-years, is absolutely prioritized, aiming at being understood as primary step in the pursuit of three-dimensional spatial 'plots' – as opposed to two-dimensional orthographic drawing (other forms of drawing follow in recording the outcomes). Every academic year the semester plan is updated or entirely altered on the basis of the above arguments. One of these iterations is outlined below.

2. Impromptu Fundamentals

The design venture is initiated with extensive exposure to the premise of architectural modeling, focusing on Villa Prototypes that demonstrate their geometric organization. Through the scaled fabrication of analytical models (physical maquettes) compositional systems and elements are recognized, examining progressively multiple layers of enclosure, revealing formal and spatial qualities. The second and third stages of the semester are composed of individual projects which are further divided into distinct phases. Individual projects and steps build upon each other in an additive and/or subtractive mode, as individual and sequenced facets of a greater design scripture. The premises of the projects gradually unwinds revealing unforeseen sets of relations; antithetical or complementary conditions.

The organizing concept of a parallelepiped divided into 6 (six) equal cubes serves as precedent for the main design voyage. The working tool, a ruling system [here called "theca"] – the modified frame of a Villa prototype – is transformed into an immaterial system of lines without thickness – a wireframe.

2.1. Mutant Theca

A second "twin" frame is inserted triggering an investigation of potential incursions between the two identical entities. This "twin" frame – the "clone" – enables a series of spatial explorations bound by axes of the two initial wireframes. The relation between the two thecas is rethought under the perspective of defining spatial boundaries.

2.2. Planar Linkage – Bounding, Intertwining, Weaving

Sixteen 16 rectilinear vertical planes – called here bounders – are positioned between the horizontal and vertical members of the interlocking *thecas.* The bounders connect to members of the *thecas* along two or maximally three edges. Sixteen 16 [minimum] paper strips/ribbons of various widths are weaved between the horizontal and vertical members of the interlocking *thecas.*

2.3. Volumetric Staggering

Six [6] translucent rectilinear prisms are supported/suspended/stacked between the horizontal and vertical members of the interlocking *thecas.* Consecutively the prisms are studied in further detail and are reconstructed using more than nine [9] planes of varying opacity allowing void areas – openings – to emerge.

2.4. Re-Settling – Breakage – Mobilizing

The theca frames are disassembled into their original subcomponents. Re-using all grid elements a novel iteration of supporting the prismatic entities is invented. The initial cubes dissolve into an assembly of frames and volumes. In the mobilization – next – step, a circulation system of ramps, stairs and corridors emerges thereafter, linking the volumetric enclosures, enabling fluidity of movement. Scalar identity arises, setting a tectonic presence to all figurations.

3. Abounding Materiality

3.1. Project A – Crystalline Stereometrics

Conditioning: Our focus is on vectoral schemes. The initial abstract monad is an 8"x8"x8" transparent cube that remains almost imaginary. For the containment step, the operating elements are vectors, and physically, 1/4" x 1/4" square or 1/4" round basswood sections – joints and junctions are expected to be well crafted. The formal entities are three Pieces [Bodies] and two Integral Voids.

Uni-Form as Multi-Order: Organization. Without re-constructing the outer shell, edges or faces, the initial cube is defined by use of three inscribed bodies that delimit between them two voids. The bodies are freely defined polyhedra which are materialized solely through their edges and not as surfaces.

Split as Uni-form: Division. All inscribed items, voids and bodies, are pre-designed. The voids are considered as shaped entities and not solely as remnant nor as residual space between bodies – re-address the cube outer shell without tracing it.

Re-Positioning Unbound: by dismantling, re-setting and re-configuring the three bodies new syntheses emerge: the whole project becomes a hologram for new formations.

Reciprocal Endeavors: These parallel formal potentials are investigated before designing the bodies. The whole exercise may start from either end: the bodies as components of the cube or the bodies as their re-assembled image.

3.2. Project B – Rebounding Vector-Works

Mute Enclaves: This project [B] expands on the formal product of the previous exploration. The abstract device is a parallelepiped.

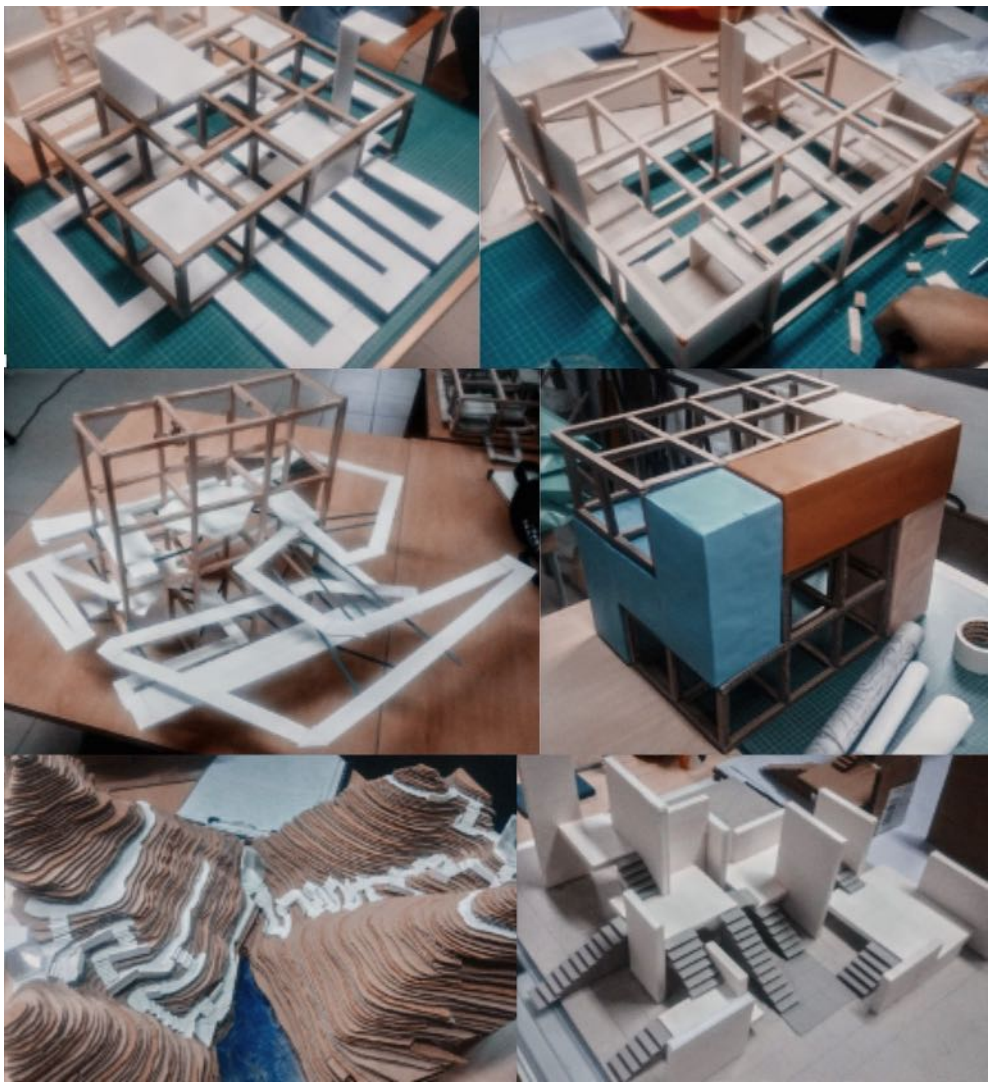

Fig. 01: Sample series of first semester studio works: (a) ramps, rooms and skeletal frames; (b) volumes and frames; (b) steep topography and pathways (b) free-standing planes with linear stairs.

Conditioning: This initial prismatic form – the starting platform – remains implicit, almost non-material.

Containment: The operating element is a series of planes.

Formal Entities: Folds; singular and continuous or multiple and intersecting.

Unwinding Verticalities: Sectional qualities are explored explicitly. The folds – deriving from the manipulation of a single horizontal plane – develop in a vertical sense allowing for potentially infinite expansion. The boundaries of the initial shape are expressed implicitly [edges of plates are not necessarily in tracing the rectangular periphery.

Systematization + De-regulation: Develop a sectional scenario of continuous folds held in place by intricately positioned linear supports [sticks/columns/vectors/axes] that form a separate sub-system; or by interlocking/kissing/touching of tips and edges of the folds.

Phase 1: Pleating Diagrams. A sequence of parallel sections of the two-way segmented folds is studied in linear projective drawings, producing depictions of all subsequent levels of the fold. Three-dimensional drawings –hexploded perspectives or axons – of individual levels serve as defining tools of the composition. Alternatively, schematic models of the pleating concepts are generated at scale of choice.

Phase 2: Conditioning Interiorities. The bodies of project A are recycled and re-used as suspended transplants within the multi-layered field of the prism. The whole three-dimensional scheme is re-designed comprising the autonomous but interrelated entities spanning between multiple layers of the fold, producing various conditions of intersection, segmentation, interlocking and division. Devices of enclosure are introduced: transparent or translucent shells defining potential programmatic zones –internal or peripheral.

Expanding Auras: The individual growth of particularity and interstice is examined; the emergence of discreet environments; establishing the characteristics of a habitable terrain.

Cocooning Skins: The zones where the enclosure schemes are introduced on the basis of the folding archetypes are studied in drawing format – linear/exact [plans, elevations, sections, axonometrics in full scale] or 'unexact' [sketches, perspectives, diagrams, notation].

Mapping Diversities: Focus is on the relation between vector-based systems and planar domains.

Uncanny Congestions: Work proceeds simultaneously in sketch and models optimizing the cohesion or antithesis between individual entities.

3.3. Project C: Emotive Transition

Expansion – Dissolution: We are by now overtaken be a creative crescendo, confronted with an overwhelming output. Our agenda is re-directed towards new terrains: we have to essentially [if that term means anything] comprehend all we have made, analyze our intuitions, contextualize our apprehensions and melt the singular massing into a fictional landscape of operation. If so far we were concentrated on formation, gravity, materiality, we will now focus on emotion, perception, intention, expectation, desire, cognition. A set

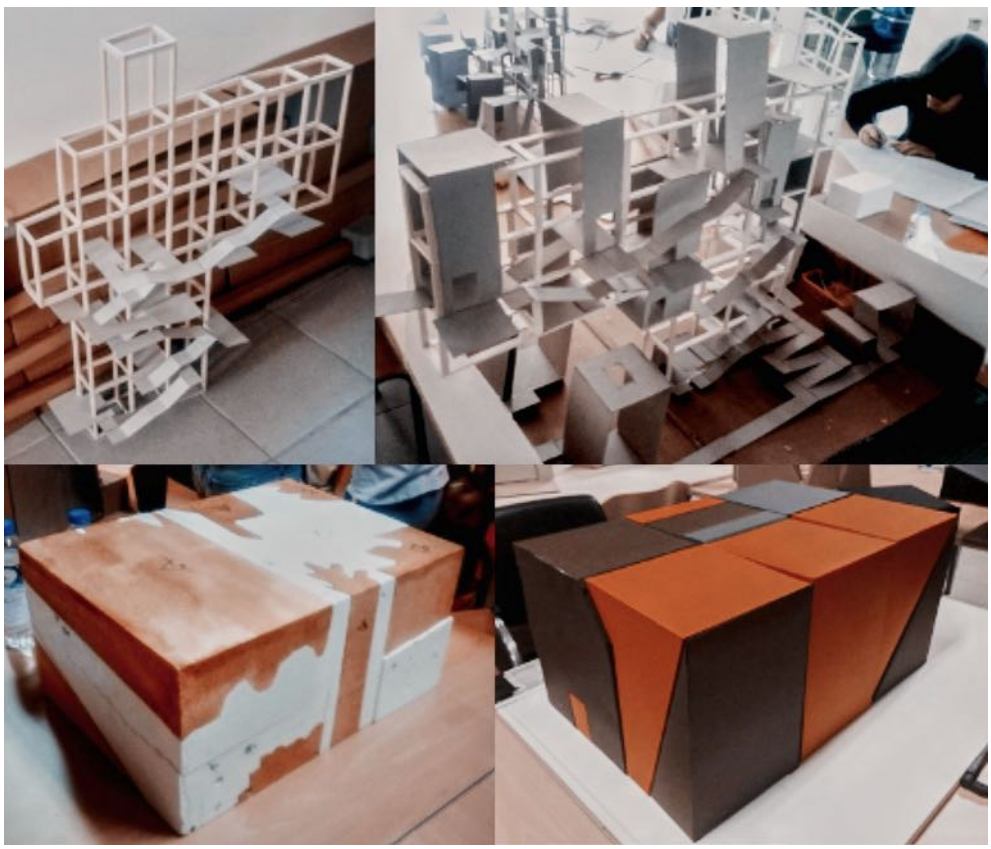

Fig. 02: Sample series of first semester studio projectiles: (a) One-storied building frame re-used as sectional skeleton with programmatic pods; (b) Parallelepiped divided into positive and negative volumes, voids and solids.

of drawing and diagrammatic inquiries explore the fusion, diffusion, melting, intertwining, interweaving of the singular *objectile* into a greater topography. This multi-layered landscape will have to be examined programmatically as much as formally becoming an indispensable component of the synthesis.

A series of tentative initiatives are outlined: synergy vs. opposition, systematization vs. irregularity, continuity vs. fragmentation, cohesion vs. juxtaposition, utilities vs. amenities, gradation vs. collision, weaving vs. dispersing.

The project is divided into [two] phases referring to two distinct scales and modes of operation:

> Phase 1: Expansion/Dissolution. The planar or frame-based entities generated so far define wider territories; scriptures of habitation; re-establishing, negotiating manipulating and expanding the boundaries of the initial prism.
>
> Phase 2: Post-synthesis? The secluded scheme grows into choreography, and major issue is its actual matrix: do we shift from the *centrifugal* to the *expanded?* Do we re-set the *nomos* of our field operations at this later stage taking into account the new conditions?
>
> Emerging Scenarios: Story-telling becomes our modulator, verbalism evolves as our central tool as we dig into our own creative notions. We need to simultaneously build upon intellectual references, expand on observations, analyze intuition, rely upon adopted dialectics, embedding all problematic into our previously visceral formations.
>
> Phase 3: Diagramming. Schematic experimental models, mock-ups and 2-D Sectional and planar analytical studies of the expanded terrain; growth patterns; formal patterns; functional, fictional and emotive scenarios represented in 2-D panels demonstrate the potential strategies for expansion.
>
> Phase 4: Expansion/Dissolution: Actual production of all syntheses.

3.4. Recourse

The full spectrum of experimentation cannot be contained here: thematic areas attempt to toy with a full range of design tools. Projects carve paths and routes on steeply sloping mountainous topographies; or dig tunneling catacombs – semi-open to the elements – upon thick topographic ramparts, primarily underground, testing plasticity and subtraction; others may combine skeletal assemblies with exclusively ramping movement and hierarchies of procession through individual rooms; or generate open-air installations solely with freestanding planes – walls and slabs that deny generating closed solids – linked through linear stairs; projectiles explore positive and negative space – volumes – inscribed within greater 'primitive' solids; then explore sectional assemblies in tall and narrow wireframes – thus denying the authority of planar projection; and so much more. While such outsets deal exclusively with practicalities, the stage is set for architectural criticism thereafter, overcoming the icebergs of unframed and random approaches. The absolutely practical

and quantitative structure of project outsets precisely guides the discussion to the creative input of students, avoiding vague argumentation on the choice of individual strategy within the context of each thematic area. The directive is clear: if all requirements are addressed, architecture may start to emerge as the next phase of elaboration; and here enters theory.

4. Autobiographically Critical

These projectiles – and lots more – are accompanied by an active and ongoing writing act: the designer's diary. The class is encouraged to record through sketches all works – physical maquettes primarily, acknowledged individually as successful – or their parts thereof. Perspectives, freehand drawings, axonometrics of peer pursuits are expected, encouraging everyone to follow others' output, to come close to their production, 'read' and record it.

Informal discussion of work in progress is thus strengthened and the results are presented verbally over collective review sessions and crits, while a written component is also developed and shared as a theory requirement embedded within the studio. Students are actively exercising critical skills, while starting to build up a persona and character. Studio culture is thus reinforced and bonds between class members are nurtured, rendering progressively obsolete the presence of a top-down supervision tactic. A similar approach is established with theory readings and through responses to faculty lectures. For assigned texts, a small team of students acts as the presenter, another team are the correspondents responsible for questions addressed to the main hosts and for leading a discussion afterwards, while the entire student group acts as participating audience. All members of the class, from their respective roles, submit journals, presentations, commentaries, notes. When tutors or visitors present a historical topic or introduce theoretical issues and critical notions, attendees are also expected to submit – through the online e-course platform of the institution – a journal or response to the agenda of the talk, or to answer a series of questions that tentatively link the thinking process to the work pursued. Texts are furthermore prepared and submitted through a final portfolio, progressively shared through in-class presentations, developing the ideas, methods and techniques introduced by each projectile during the course of the semester. Phenomena of an indelible esotericism are thus overcome through continuous effort, through debate, trial and error.

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The Cows: Evidence of the Habits of Beginning

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Abstract

One of the more remarkable characteristics of undergraduate beginners in design school is their almost absolute lack of knowledge of the subject, or any experience with the structure and methods of its instruction. For students who enter university to study the "liberal arts" and sciences there is little need for initiation since they know what's coming. For the vast majority of beginning design students however, the landscape of design school and the studio based model of learning present the opposite-a stunning cognitive cliff. As designers this is a cliff on which we have all perched. What makes this observation particularly vivid and revealing is that even a casual survey of the products of most foundations studios reveal a level of sophistication, craft, and consistency that belies the maker's incompetence. The implausibility of these levels of refinement suggest that the products of their novitiate are part of a carefully curated mirage. The overall quality and consistency of these exhibits suggest a system of both subtle and overt controls are operating to suppress the noise, confusion, uncertainty, and ugliness that would be expected in the creative efforts of novices. The paucity of awkward, uncertain, failed things in many beginning design studios led to questions about the authenticity of this work. This provided the impetus for a series of projects that carefully removed or modified these controls. The desire was to reveal the static state of beginners' thinking, ability, instincts, habits, bias, etc., so that students' design education could begin from where they are - not from where we might want them to be. These probes uncovered extraordinary patterns and consistencies in the thinking and judgment of novices. The 'Cows' reflect the visual and cognitive defaults that define the true starting points of design education.

1. Introduction

Initiation is a curious and charged term. Its common understanding frames the act of beginning in a very particular way. It creates an image of 'beginning' as a structured, ritualistic, celebratory, and carefully considered crossing of some brightly defined threshold. It signals the start of a highly sought-after and prized 'change-of-state' - from excluded to included. It holds a promise of acceptance and desired identification with a selective group of peers. In this model of 'initiation,' what lies on the other side of that threshold, the particulars of the process of the 'conversion,' are often intentionally blurred and made mysterious as well as intimidating. However, the rituals belie the assumptions and expectations of the initiates for an ordered process of indoctrination with clearly defined objectives and outcomes - 'all will be made clear' on the other side.

For most first-year college students the rites of initiation into higher education, the assumptions and expectations of the experience, have been rigorously constructed and reinforced over 12-years of preparatory schooling. The initiation into college, the beginning of 'higher' learning, advanced study, and the promise of intellectual and personal autonomy is celebrated as the 'commencement' of adulthood.

For students entering university to study the Humanities - the 'Arts and Sciences' - there are few surprises waiting in regards to the 'process' of going to college. While the exposure to the subjects, the depth and the rigor of the educational experience gain in intensity and expectation, the actual structure, patterns, methods of instruction, study, and learning, remain largely unchanged and deeply familiar. Students know what is coming. They are familiar and practiced with the structure of the subjects, the modalities of instruction and, critically, the criteria and methods of evaluation. Overall it is a familiar and comfortable landscape in which the well-practiced cognitive habits that led to their acceptance will be largely serviceable, at least academically, during their 'initiation' and beyond. For undergraduate students entering into design school the situation is quite different. The fit between experience and expectations will loosen quickly and dramatically.

There is a sharp break between the carefully nurtured and adaptive cognitive as well as visual habits a novice designer shows up with and the significantly different requirements and expectations of design school. This moment presents an extraordinary cognitive cliff. The discontinuity of experience, ability, and attitude along with the near complete lack of rudimentary skills in 2-or 3-dimensional representation, contribute to the considerable challenges of teaching foundation design students. However, it also presents important opportunities to test the assumptions and traditions of much of beginning design instruction. How students are led through this unfamiliar landscape vividly reveals the serious responsibilities assumed within a first-year design studio.

"Here is what we have to offer you in its most elaborate form - confusion guided by a clear sense of purpose." [1] Gordon Matta-Clark

The positions discussed and the work presented here were informed and reinforced by a series of small but pointed surveys of first semester architecture and design students at

both undergraduate and graduate (MArch I) professional programs in architecture. [A.1] The idea for this survey was originally prompted by curiosity about first-year students' attitudes and ideas about a subject none have ever studied before. This is a very unique subject pool within any university. While the survey has remained informal with subtle changes over time the results, although anecdotal, have remained remarkably consistent - the responses fall in a very tight range year-to-year, school-to-school, and now country-to-country. The responses and their consistency reveal interesting baseline patterns of thought and attitude in beginning designers.

In general the responses of novice design students to specific questions about how they define architecture - its importance, its process, its value - strongly confirm what most faculty already know. Students come to design school knowing very little about art or design and what they claim to know, which is also remarkably consistent, is breathtakingly, well, naive. The results however come as little surprise. Where would their exposure to this subject come from? Very few entering students have studied art or art history in high school. Also virtually no entering undergraduate has had any experience with a studio or project based learning environment with its demands for self-organizing behavior and its collaborative social dynamic. The initiates robust ignorance of the subject and the absence of understanding or experience with the structure, form, or content of its pedagogy is reinforced by the fact, according to the survey, that in a number approaching totality they have never read a book on the subject. Similar numbers, excluding those following in parents' or siblings' footsteps, have never spoken to a practicing architect or designer nor have they set foot in a design office of any kind.

Given this miraculously clean slate, the evidence raises the questions: Why are they here? How was this decision made? ...based on what criteria? ...what are their expectations? ... desirers? ...dreams?

Equally miraculous, a casual visual survey of the products of most foundation studios often reveals a level of sophistication, confidence, craft, and consistency which belies the beginners' otherwise admitted and demonstrable incompetence. The spectacular impossibility of these levels of refinement and confidence suggest that what is actually being produced is a beautifully elaborate mirage - a remarkable and self-reinforcing false-positive.

Typically and authentically, novices with this amazing lack of exposure to the subject would be expected to produce ugly, flawed, timid, naive, uncertain, feckless work. However, often this is not the case. The absence of this type of work strongly suggests that a form of 'imprinting' is taking place. Like the ducks in Konrad Lorenz's early research in behavioral ecology [2], novice students autonomically model their behavior around the first shinny things to enter their visual field, unquestionably transcribing the images presented and mimicking the operations demonstrated. An element of the 'baby-duck syndrome' that makes this analogy vivid in the context of beginning design pedagogy is that behavioral imprinting is a form of 'phase-sensitive' learning. It produces a profound effect that occurs within a very specific and critical developmental moment and is 'open' for limited time. For bright, motivated first-year design students the depth of their incompetence may graciously increase the duration of the 'phase,' but not forever.

The work presented is based on the belief that the model of 'phase' learning describes and helps to understand what is happening in beginning design studios. Viewed through its frame the constellation of consistent behaviors displayed by novices, along with those of their faculty, raise interesting and important questions about the motivations, objectives and methods of the indoctrination into design education.

'The Cows' is a term used to describe work from a range of projects that have evolved over approximately a decade of first-year studios at both the undergraduate and graduate levels to test and question these objectives, methods, and expectations by revealing and then starting with what the students actually know how to do. The important constant is that these projects are the first thing, or very close to the first thing, the students see, hear, and respond to. They represent a series of probes that aim to disrupt the common 'imprinting' model applied to a great deal of foundation design instruction and to consequently alter the design behavior and products common to beginning design students.

The projects test a simple set of questions: what do you see if the controls and prescriptions of design instruction are stripped away from the very initial attempts to order something? What is the base-state of the judgment, thinking, and action of design novices? What does it produce? And how can the intensity of 'phase-sensitive' learning, an opportunity created by the 'cognitive cliff' between expectations and reality, be used to accelerate students' sense of independence, control, and responsibility over their work?

2. Hypothesis

Justin Kruger and David Dunning in their seminal study of incompetence, *"Unskilled and Unaware of It: How Difficulties in Recognizing One's Own Incompetence Lead to Inflated Self-Assessments"* [3] define incompetence as follows, *"People tend to hold overly favorable views of their abilities in many social and intellectual domains. The authors suggest that this overestimation occurs, in part, because people who are unskilled in these domains suffer a dual burden. "Not only do these people reach erroneous conclusions and make unfortunate choices, but their incompetence robs them of the metacognitive ability to realize it."* [4]

Given Kruger and Dunning's findings, 'beginning' - especially for undergraduate design students - starts in a near-pure state of incompetence. Their findings that, *"Paradoxically, improving the skills of participants, and thus increasing their metacognitive competence, helped them recognize the limitations of their abilities,"* [5] suggests that delaying the recognition of the limitations of their own judgment and action can only prolong their incompetence.

The objective of 'The Cows,' and other related projects, is to give novices and their faculty opportunities to observe the unadorned limits of the students' cognitive and visual abilities and skills to provide a baseline from which authentic and comprehensible progress could be measured.

3. The Innocent Eye Test

"The Cows" result from a simple, intentionally ambiguous, request to construct a sequence of 3 spaces. This is followed with a set of loose assembly instructions. The simple and non-prescriptive limits require the students' interpretation and judgment in order to proceed. No clarification is given and no questions are answered. (Figs.1,2,3)

The typical brief is as follows:

"I often find that having an idea in my head prevents me from doing something else. Working is therefore a way of getting rid of an idea." "Do something, do something to that, and then do something to that..." Jasper Johns

1. **Cut** - two sheets of A1 mat board - one black and one white - neatly in half (making 4 A2 sheets).
2. **Make** - a pile of shards and fragments using one black and one white A2 sheet. The pile should contain large, medium, and small pieces. About half the pieces of each sheet should be carefully cut with a knife, and the other half ripped and torn by hand. No single piece should be wider, or longer, than your hand. Don't think too hard about this.
3. **Assemble** - two spatial compositions using the cut and torn pieces. Each one should create 3 sequential spaces. Use white glue or slot/tab/fold construction, or any combination of methods to build the compositions. If needed use pins and tape for temporary support.
4. **Repeat** - this process at least 3 times so you will have a total of at least 6 compositions. Watch while you make - think last (refer to Johns quotes). These things are to be formed through visual and manual instinct and intuition as opposed to calculation and plan.
5. **Remember** - short of not trying there is no way to screw this up.

4. The Evidence

All initial trials produce a set of persistent, predictable, judgments and results. They fall into the following categories:

- **Interval Consistency:** the spacing of all elements within a composition are remarkably consistent and remain so across all trials. This is true both within an individual's set of constructs and across the group.
- **Scalar Consistency:** while working with three different sizes of parts; small, medium, and large, with the 'large' element limited to the size of the hand, the distribution of the three sizes are almost universally equal, universally creating non-hierarchical compositions. Again, this is true both in individual's constructs and the studio's constructs as a whole. In other words while the sizes of the individual pieces are controlled by the limit on the largest size, there is no restriction on the

Fig. 1: The 'Herd,' 1st Trial, White on White, LSU
Fig. 2: The 'Herd,' 1st Trial, Color, LSU
Fig. 3: The 'Herd,' 1st Trial, Black and White, AUS

aggregation of the individual pieces into a larger single part. This option is never explored. As seen in the images, the final constructs are all roughly the same size.

- **Shape Consistency:** It rains triangles. Both in the cut and the torn pieces there are virtually no 90° corners. Rectilinear shapes are very rare with the square pushed to near-extinction.
- **Color/Value Consistency:** In many of these projects color was introduced as a variable. This choice produces one of the more curious outcomes but, upon reflection, its presence is predictable. As with the other characteristics, color is distributed uniformly across the composition. The black/white mat board produces the most vivid results. Its use creates three dominant conditions: all white, all black, and grey. The third - grey - resulting from the equal distribution of black and white surfaces across the composition, a condition that is also remarkably unchanged by orientation.
- **Spacelessness:** With virtually no exception the compositions lack any defined, detectable sequence of 3 spaces.

"You don't see what you're seeing until you see it, but when you do see it, it lets you see many other things." [6]

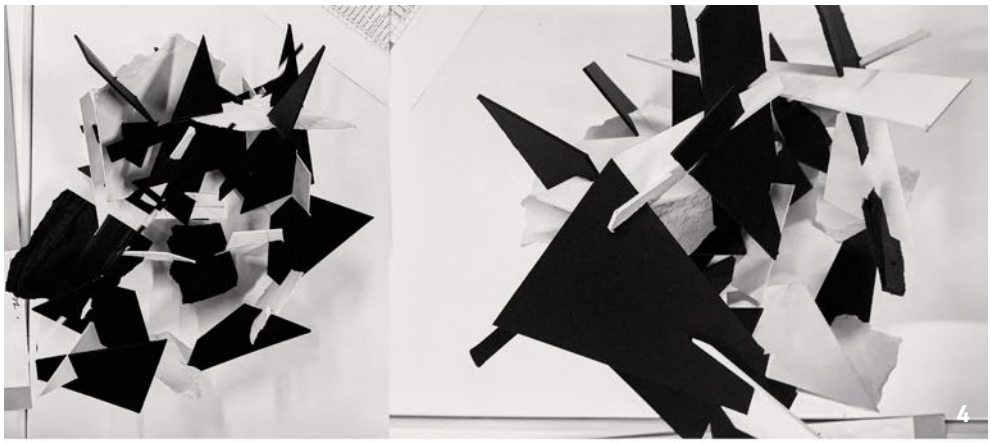
These consistencies actually constitute a gift. They can now be identified and treated as variables. The manipulation and ordering of interval, shape, size, pattern, and color can now become deliberate and experimental, guided by individual judgments. When habit becomes detectable it can be pushed against. As the students gain awareness of these consistencies and the cognitive and visual reflexes that produce them, detect their presence in their own work, and act on them, their competence evolves and their 'initiation' truly begins.

Starting from the static state of the 'cows,' students were asked to reconsider the original request to use the shards and fragments of mat board to create a composed sequence of 3 spaces. This time, however, the work will progress by selectively, systematically, and intentionally manipulating these variables.

Methods use to explore and experiment with the variables within this work have included digital and material collage, drawings, and physical modeling. The results of the subsequent trials show over time a remarkable, and sometimes quite rapid, transformation in the students' attention, action, and judgment that have effects on the qualities of the outcomes. (Figs. 5,6,7)

"The function of the imagination is not to make strange things settled, so much as to make settled things strange; not so much to make wonders facts as to make facts wonders." [7]

In the first attempt dozens of strangers, trying to create novelty and 'strangeness' in their work, produce fields of near-identical objects. The ability to identify and deliberately manipulate a small set of simple variables, on the other hand, produce fields of work with a stunning range, individual variation, and increasing compositional control.



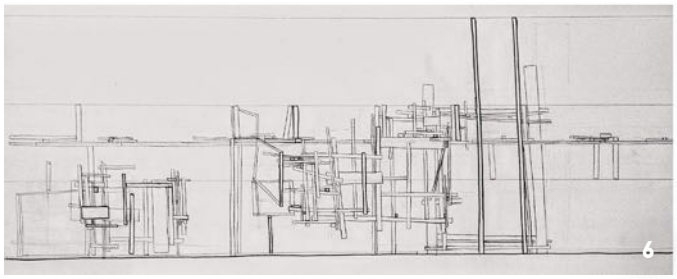


Fig. 4: 1st Trial, Detail, Black and White Cow, AUS. Kadi Sheriteh

Fig. 5: Iterated Cow, Construct, LSU. Alex Engelhardt

Fig. 6: Iterated Cow, Drawn, LSU. Megan Damiens

Fig. 7: Iterated Cow, Digital Collage, LSU. Marie Garrett, top, Giovanni Coakley, bottom

5. Conclusion

The intent and structure of the projects presented were initially provoked by the implausible gap between the incompetence of beginning design students, the result of their lack of exposure to the subject or previous experience with its methods or process, and the consistent 'fineness', refinement, and 'prettiness' of the work produced in many beginning design studios. The absence of error or outright failure in this work combined with the lack of doubt or uncertainty expressed by students' in their explanations of intent or its outcomes creates the suspicion that 'instruction' is suppressing the true 'ugliness' and uncertainty that would reflect the incompetence of beginning designers.

"Looking at representative samplings of student design work it is not difficult to decide that a large majority of architectural students (to say all students would of course be going a bit too far) but in numbers high on an asymptotic curve, approaching totality, that these students all appear to design buildings in exactly the same way." [8]

"It has been interesting to notice over the years, and I've often been a little envious of the fact, that architectural students seem to operate in an atmosphere of high certitude as they go about the business of building design. This confidence is of course not monolithic, but they exhibit very few disabling doubts." [9]

These observations were made by James Fitzgibbon 35 years ago regarding the work of architecture students in general. His explanation focused on the methodology of teaching design. While perhaps accurate he ignored the more difficult question as to the motive behind the 'method' and the role of the student in shaping it. It seems that at least one intention behind much basic design instruction is shared by both faculty and students and that is to avoid starting at what is truly the beginning.

How this cognitive gap is bridged and how the expected noise and confusion in the work of beginners is so efficiently suppressed suggests a system of both subtle and overt controls. These controls are applied thoughtlessly, or perhaps unconsciously, to remove the noise, confusion, uncertainty, and vagueness which would be expected in the work of beginners with no experience with the concepts or practice in the actions that define a design process.

"It is as certain as it is strange that truth and error come from one and the same source; for that reason one must often not do something to the detriment of error since one would do also something detrimental to truth." [10]

The Kruger-Dunning's definition of incompetence beautifully articulates what we all know - from personal and professional experience - is true: *"...those with limited knowledge in a domain suffer a dual burden: Not only do they reach mistaken conclusions and make regrettable errors, but their incompetence robs them of the ability to realize it."* [11] Attempts to mask the incompetence of beginning students by using technique and fixations on craft cannot overcome it, but can only delay its expression.

The intention of this work is to make the student aware of their 'unawarness.' It aims at exploiting the paradox revealed in Kruger and Dunning's work: *"...one way to make people recognize their incompetence is to make them competent."* [12] By making beginners aware

of the limitations created by their conceptual and visual habits, which is the static state of their knowledge of design process, gives them control over it increasing their competence. This begins the development of an earned confidence.

The process of beginning, the 'initiation' of novice design students, is a critical moment and beautifully odd in the context of education. The 'cognitive cliff' faced by beginners - their incompetence - makes the first things they are told, the first things they are shown, the first instructions they are given, tremendously powerful. They will quickly and irresistibly imprint on these experiences. They will model their behavior around these things and will shape their actions, their thinking, their judgments, in ways that compare with what are presented as exemplars. The structure, content, and atmosphere created for this brief 'phase-sensitive' learning moment has the power to shape in profound ways the trajectory of their education. It should not begin with an illusion, but with a recognition of where they are, the true starting point.

Appendix A

A.1 SURVEY: THE QUESTIONS

These six questions, and one annotated graphic, are intended to provide some insight into how you think about architecture and design at the beginning of your design education. Please answer these candidly, thoughtfully, concisely, fearlessly, and in the order they occur. Be guileless. Your responses will be the public property of the studio and an important reference for this semester's work.

THINK HARD - WRITE FAST.

1. How do you define design?

2. How do you define architecture?

3. Is there a distinction between architecture and building? If yes, what is it?

4. How do you begin to design something?

5. Why are you studying architecture?

6. Have you read any books or journals about architecture or landscape architecture? If yes, please name:

7. Below please draw a diagram, a map, that represents the process you use to design something.

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Instilling the Importance of Wellbeing in 1st Year Design

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Abstract

This paper will outline strategies of embedding wellbeing into teaching large first-year design studio students. Today's university students are different from those teaching them were as students; the world is different; we live differently. All these differences are increasingly changing faster, resulting in increasing students suffering from mental health issues. By reconsidering design studio to be driven by student wellbeing rather than design outcomes. How can students achieve learning outcome with less mental health issues? Research by New Economics Foundation (NEF) on behalf of Foresight suggests that improvements in wellbeing can help to reduce some mental health problems and also help people to thrive. For the last two years, I have taught a cross-discipline first-year architecture design studio foregrounded with the importance of student wellbeing. At the start of each project, the Five Ways to Mental Wellbeing by Foresight are introduced to locate and give students strategies to help there learning. The five ways are to connect, be active, take notice, keep learning, and give. Each project is related to ideas of wellbeing, a structure to sit on (connect and take notice), a mindfulness pavilion(take notice) and an urban retreat (be active) as a method of introducing spatial fundamentals in design. Thus, allowing the students to explore what wellbeing means for themselves. Time management methods are also introduced to encourage students to be productive within the limited time they have. Also, different design processes are introduced to help students move beyond preconceived outcomes (keep learning), the British Design Council's Double Diamond and then an Agile design process. A range of in-class studio exercises has been developed to demonstrate the Five Ways to Mental Wellbeing while teaching the design fundamentals. In combination, all of these small changes have resulted in high student participation and engagement.

1. Changing Student Wellbeing

Over the last 16 years of teaching architecture and spatial design, I have experienced a substantial change in student wellbeing and ability to deal with pressure. This change has seen an increase in students struggling to meet learning objectives sustainably, increasingly not reaching their potential, resorting to medicate the issues, or worse. First-year university student's emotional intelligence is struggling to keep up with the social and technological demands they face. I have personally seen this change with an increased number of students; requesting extensions, reporting anxiety, the list continues.

In response to these changes in students emotional wellbeing, I have changed the focus of the first-year studio course I teach to embed concepts of wellbeing. I have done this while maintaining the course prescription and outline. The course, tilted Introduction to Design Processes / He Tīmatanga Kōrero mō Ngā Mahi Whakarākei, uses studio-based projects to introduce concepts and processes used in the design of human environments. These concepts and processes are examined in relation to the physical, social and cultural contexts in which designers operate.

The course introduces and guides students through a range of design processes and principles that can be applied to design projects in the built environment disciplines. Throughout the course, students engage in studio learning practices to explore and develop confidence in spatial language. They also acquire a variety of skills that will help them to address complex problems with creative solutions. The design projects set as coursework build in scope from the scale of the body to the scale of the landscape.

1.1. The Five Ways to Wellbeing

Within the constraints of the course outline, adjusting the design studio to be driven by student wellbeing rather than design outcomes. The Five Ways to Wellbeing recommended by The National Health Service in the United Kingdom and The Mental Health Foundation of New Zealand was used to frame the course and give direct guidance to students.

Connect*:* With the people around you. With family, friends, colleagues and neighbours. At home, work, school or in your local community. Think of these as the cornerstones of your life and invest time in developing them. Building these connections will support and enrich you every day.

Be Active: Go for a walk or run. Step outside. Cycle. Play a game. Garden. Dance. Exercising makes you feel good. Most importantly, discover a physical activity you enjoy and that suits your level of mobility and fitness.

Take Notice: Be curious. Catch sight of the beautiful. Remark on the unusual. Notice the changing seasons. Savour the moment, whether you are walking to work, eating lunch or talking to friends. Be aware of the world around you and what you are feeling. Reflecting on your experiences will help you appreciate what matters to you.

Keep Learning: Try something new. Rediscover an old interest. Sign up for that course. Take on a different responsibility at work. Fix a bike. Learn to play an instrument or how to

cook your favourite food. Set a challenge you will enjoy achieving. Learning new things will make you more confident as well as being fun.

Give: Do something nice for a friend, or a stranger. Thank someone. Smile. Volunteer your time. Join a community group. Lookout, as well as in. Seeing yourself, and your happiness, linked to the wider community can be incredibly rewarding and creates connections with the people around you.

The above areas are referred to during the course and students are encouraged to look after their own health, to eat well, sleep well and exercise well, to lead a balanced lifestyle.

2. Course Introduction

At the onset of the studio, I begin by telling my journal through the education system to 350 diverse students, from high achievers to first in the family university. I introduce myself and where I have come, taking the time to explain the struggles and hurdles I have overcome during my life. I tell my story to demonstrate it is ok to struggle, fail, to be different, to allow students to connect, to see me as a colleague rather than the master. Students have thanked me for telling my story, they seem to be able to associate themselves with my struggles and successes. By opening myself up to the students I aim to build empathy.

Growing up in small-town New Zealand, in a place called Waipawa. While I 'mostly' enjoyed school and was diligent, I struggled, really struggled with the education system, having difficulty reading and writing. Fortunately, my mother realised that I had dyslexia when I was about 10 years old, pushing the school to give me support to improve my reading and spelling. While I still struggle with spelling and writing, I have developed workflows and strategies to get by. Due to my struggles at high school, I never considered university an option, until my final year it was suggested that I 'give it a go'. Being someone who loves building, problem-solving and drawing, I applied for architecture at Victoria University of Wellington. During my first year, my performance was avenged, continuing to struggle. I failed an algebra course. There I said it, I fail spectacularly, not just failing, really failing. Meaning, I could not continue on to architecture school. Requiring me doing another first-year, this time I took geography and design courses. I only needed a few credits, so was able to work part-time as a metal fabricator. After that year, I managed to 'just' get into the second year of architecture. Once within the architecture programme my grades improved, I found my grove, even getting A+ in structures, due to the practical applied nature of the content.

A few years later, I was fortunate to go on an exchange to UC Berkeley which open my eyes to the rest of the world. After graduation, I worked in San Francisco at Holt Hinshaw Architects for 3 years. I then moved back to New Zealand to start teaching Spatial Design at Massey University in Wellington, where I started my PhD at RMIT under Mark and Jane Burry. I also struggled to do my PhD, often thinking I was not smart enough and would not be able to complete it. With determination and grit, I am now a doctor.

Students have thanked me for an honest explanation of how I ended up teaching and said they feel inspired to start their university study. After introducing myself, I cover the course

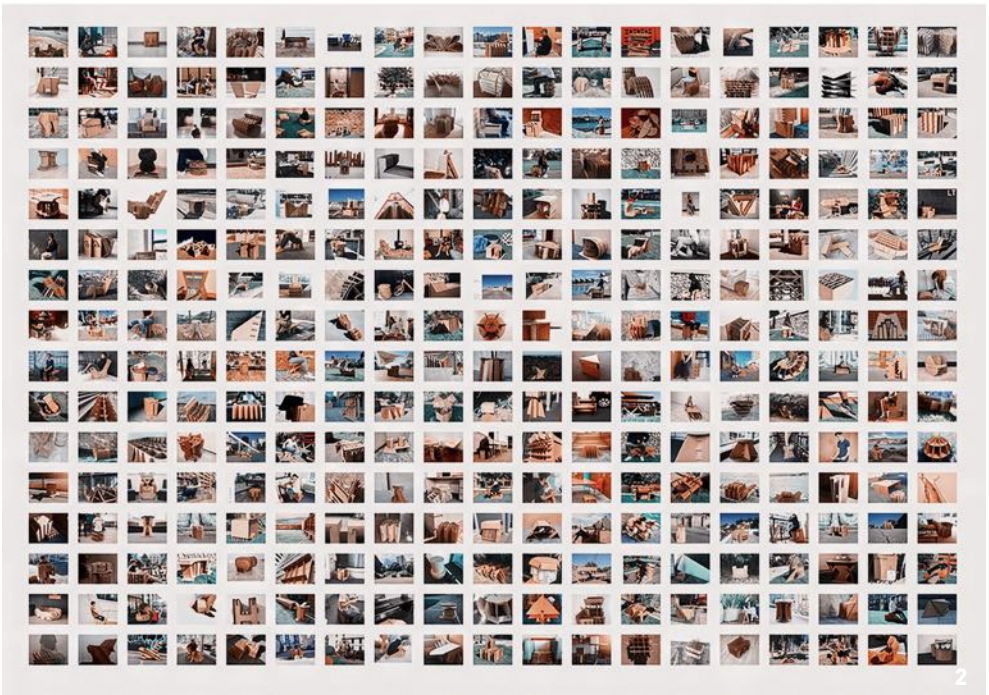

Fig. 1: Five Ways to Wellbeing.

Fig. 2: Student cardboard structures to sit on.

structure and the first project. The course is studio-based with three projects that introduce concepts and processes used in the design of human environments. These concepts and processes are examined in relation to the physical, social and cultural contexts in which designers operate. I explain the learning objectives (below) and The Five Ways to Wellbeing

- Identify a range of design precedents and apply a variety of design strategies.
- Generate simple three-dimensional compositions using a basic vocabulary of formal and spatial elements.
- Develop an initial concept into a sketch design which acknowledges elementary structural relationships and the possibilities of construction materials and technologies.

3. A Structure to Sit On (connect and take notice)

The first project introduces students to an unknown outcome as a method of connecting with the project, first years student often what to jump to the conclusion rather than explore a design process. The Double Diamond, developed by the British Design Council in 2005, is used to get students to move beyond the known to take risks and explore the project through making. Students are asked to design and make a structure that they can sit on, made of reused corrugated cardboard, related to a given spatial verb. The Structure must be:

- Made only from reused corrugated cardboard
- Carrible by you
- No glue
- No tape
- No mechanical fasteners
- No paint
- No dimension over 1000mm
- Nothing can be left at school

Rather than start with the form of the structure, a common starting point, students start by creating cardboard to cardboard connections, learning by doing, how can you join corrugated cardboard without, glue, tape or mechanical fasteners? Tuesday afternoons in Wellington central business district is corrugated cardboard recycling. Students are required to explore the city and find a used free material rather than an expensive new material. Placing all students on a level playing field. Students are given a spatial verb each from the book [1] Operative Design: A Catalog of Spatial Verbs by Anthony Di Mari to give a direction to explore the project. The spatial verb demands students to think conceptually about the structure they are designing and building. The all developed their own cardboard structure as seen in Figure 2.

Pavilion	Mindfulness
Communal space / shared space	Accepting where you are
Connection with nature (water?)	Aware of your senses
Connection with surrounds/ nature	Awareness
Dependable function/ open programme	Be removed from external forces
Depends on the environment	Being present
Gathering community	Breathing
Maybe made of Repeated elements	Calm mind
Maybe temporary	Cleansing
Open space / openness	Comfort
Relaxed space?	Confidence
Shelter	Connection to...
Shelter from wind rain sun	Connection with nature
Simplistic?	Effortless
Sound/ quite	Encompass
	Feel safe
	Focus
	Getting out of your head
	Mentally restorative
	Personal experience and/or group experience
	Purifying
	Putting things into perspective
	Quite
	Quite the mind
	Refreshing
	Relax
	Rhythm
	Simplification
	Simplifying
	Slowing down
	Thoughtful

Table. 1: Defining Mindfulness Pavilion

4. Mindfulness Pavilion (Keep learning, take notice and give)

In an effort to expose the students to mindful practice, the second project requires them to design a mindfulness pavilion, implicitly embedding a mindful wellbeing method into the project. At the start of the project, I reintroduce the course prescription and learning objectives, to make sure students focus on the criteria, before talking about the Five Ways to Wellbeing again. This time, in reference to the time students spent working on their previous project, giving examples of ways of working smarter and the importance of looking after themselves. Talking about focusing on the task at hand, being in the moment, how to be mindful rather than mindless, encouraging students to be mindful, to understand better the project they are working on. To stop the unhealthy all-nighter attitude an agile design process is introduced.

4.1. Agile

Agile design process flips a traditional waterfall process of sequential design development to a rapid minimum viable outcome sequence. Rather than design a pavilion, add detail, render and then present, an agile process looks to do all of these stages upfront quickly, say in a week, then repeat refining each time. Allowing students to figure out what they know and more importantly, what they do not know and get feedback and support to move forward. Students 'do the project' in a week then do it again and again and again. A result of an agile design process is a more constant effort rather than a last-minute dash. An agile process allows students to attempt design options and presentation techniques they may otherwise be too scared to try.

4.2. Defining Mindfulness Pavilion

A mindfulness pavilion is not a well-known programme, and it was selected so students can not just google the answer but must engage with the process to design their definition. A quick session to help reveal possible definitions of pavilion and mindfulness is run with the students to move beyond predefined assumptions of the project programme. In Table.1, an incomplete list of ways to define pavilion and mindfulness that the class created and becomes a shared resource (keeping learning and give).

Students work is submitted each week and I review all work and select examples that can be discussed alongside methods of improving the work. Allowing students to see other students work and consider how they can improve their work. Often there are multiple 'correct' ways of meeting a brief so that I can discuss different options with the selected work. Allowing students to develop their own skills and design each week, rather than working in isolation and blindly, Figure 3 is an example of a student designed mindfulness pavilion.

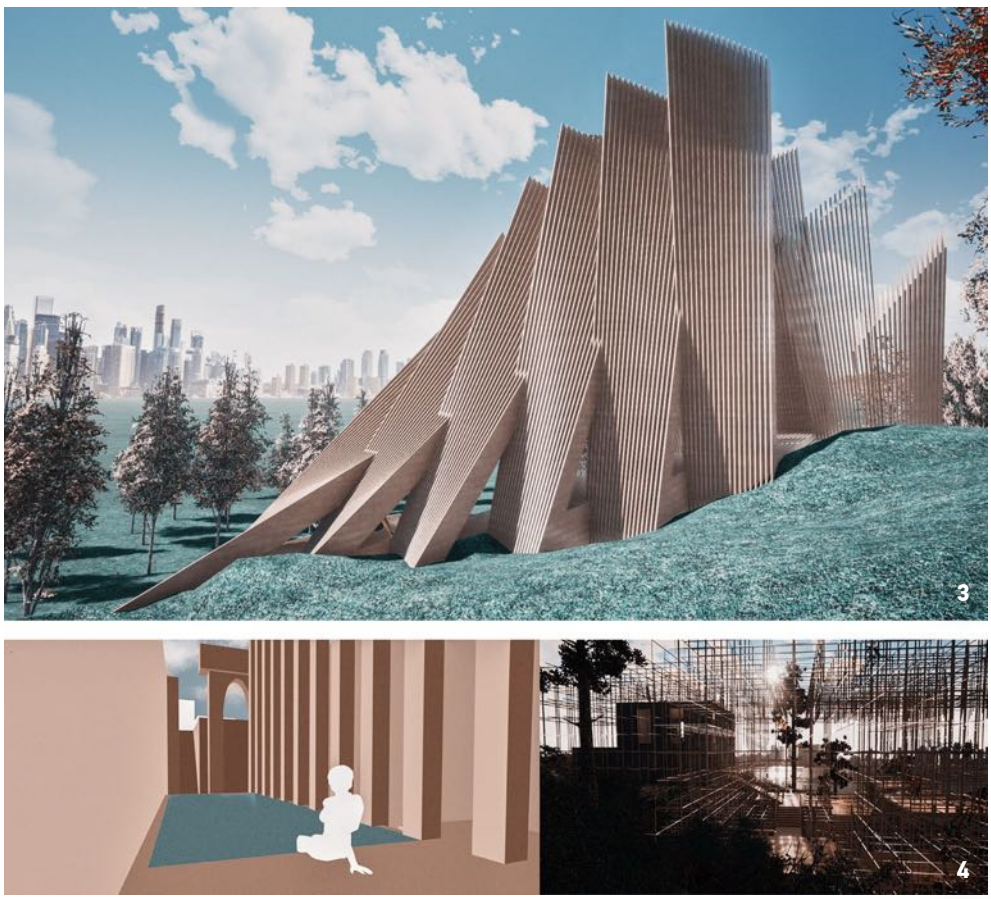

Fig. 3: Mindfulness Pavilion | Spatial verb: rotate. By Sophie Warnock

Fig. 4: The Retreat Below by Connor McKeown, left | Regarded by Karley Wilden-Palms, right.

5. Urban Retreat (be active and take notice)

The final project builds on the pavilion project. Students are given a site in the city to explore, they are encouraged to be active and take notice of how that site is situated and operates within the city. Drawing connections between themselves and others. Again, an urban retreat is a unique programme and an 'answer' cannot bbe found online, the students need to trust in the design process to deliver a design.

Traditional architectural education is based on spending time, lots of time, at a drawing board, manually learning to craft your spatial ideas. Today, students have access to digital tools that allow fast development and visualisations of architectural propositions. In addition to these tools, a plethora of inspiration is now accessible at the end of their fingers. The Mindfulness Project required students to use SketchUp and Twinmotion; these were selected as they offer free education versions for students and are cross-platform, allowing no bias to better-off students. There are ample online tutorials and support for students to learn the software. These software packages are quick to learn and get quality outputs. Gone are the days of spending hours rendering, either by hand or computer; now it is possible to render in near real-time. For the Retreat Project students are given the choice of what software to use, allowing then to take ownership for their education and allow a difference in how they work and what they produce, building independence.

A conscious effort is put into acknowledging and allowing students to progress on their own path, supporting students to work with their strengths and develop their weakness. Figure 4 illustrates the difference in approaches of two students urban retreat.

Three-quarters of the way through the course, students have experienced the difference in time expectations compared to high school. In an endeavour to help students manged their time more productively a session on time-management is delivered that offers a variety of tactics for students to manage their time throughout the design process better.

6. Conclusion

By reconsidering design studio to be driven by student wellbeing rather than design outcomes, students can achieve learning outcomes with less mental health issues. I have been teaching for over 16 years at university; over this time, I have seen a substantial reduction in students' resilience. By using the Five Ways to Wellbeing to reduce some mental health problems and help students to thrive. For the last two years, a shared cross-discipline first-year architecture design studio has been foregrounded with the importance of student wellbeing resulting increase student engagement and quality of learning.

This course moves beyond just teaching design processes to foreground the students' wellbeing within the processes. To get students to focus on the design process rather than a preconceived outcome. The first project uses the Double Diamond process to allow divergent thinking, starting with connection details rather than a final form. Physical making is key to allow students to tangibly understand spatial verbs. Focusing students to connect

and take notice, not to assume form finding is the only way to design. The second project introduces the Agile Design process to allow students to figure out what they know and what they don't know. Getting feedback early in the project, so issues can be resolved before it becomes too late to get help, allowing students to meet the learning objectives to the best of their ability. Adding design software in this project to allow the students to keep learning and take notice new methods. Facilitating the students to collaboratively define mindfulness pavilion as a way to give to each other. Time-management is central to student wellbeing, the final project introduces a range of productivity tools to help manage their time. Giving the students options that best suit their learning style and motivations. The brief allows students to be active and take notice in different ways, supporting their wellbeing.

Students face significant hurdles in their social and emotional wellbeing. We need to be doing more at supporting and helping our students develop not only the technical skills also soft skills. To consider their learning more holistically.

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Critical Thinking and Crits in the 1st Year Design Studio

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Abstract

First year design studio has an important and critical role in architectural education since students must learn how to develop a new language in which they are not accustomed to. According to NAAB, important learning criteria for architects are critical thinking and representation: "architects must have the ability to build abstract relationships and understand the impact of ideas based on research and analysis of multiple theoretical, social, political, economic, cultural and environmental contexts". Design studio promotes critical thinking and facilitates an environment where students are educated to question issues and create new ideas. In general, the design studio teaching system is endued with criticism and the role of the teacher is crucial in helping students to improve their critical complements. Architectural practice demands from architects critical thinking and critical capacities. Thus, critique is important to the teaching of design assisting students to act as architects. It also helps them to make a stand and a take a decision (***prendre parti***). The process of exchanging ideas and gradual improvement of student's projects through dialogue, advice, encouragement is enriched with the critique of other fellow students and with the contribution of external "actors" through organised crits. This process operationalizes the critical thinking of the students. The presentation will focus on the ways the first-year studio in the School of Architecture of NTUA - organised in four sequential thematic exercises - enhance the critical thinking of students and an innovative approach to designing.

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1. On critical thinking

The architectural education is mainly based on the design studio teaching system and this is infused with criticism. As the "American Institute of Architecture Students" mentions in its Report on the *Redesign of Studio Culture,* "Design studio teaches critical thinking and creates an environment where students are taught to question all things in order to create better designs".[1] Architectural practice demands from architects to have critical thinking. Values are in continuous change in the world of the profession and architects should respond to the new situation with the proper capacities. Considering design as an act based on observation, exploration and generation, "critical thinking is the means by which designers observe, learn, analyze and make decisions." [2] It is a core issue in European and USA accreditation systems of architectural education. According to the Professional Qualifications Directive [2005/36/EC] and the Architects Registration Board (ARB), U.K. critical capacities are included in the criteria for becoming an architect. Also, according to NAAB, important learning criteria for architects are critical thinking and representation: "architects must have the ability to build abstract relationships and understand the impact of ideas based on research and analysis of multiple theoretical, social, political, economic, cultural and environmental contexts" [3].

Thus, critical thinking is crucial to the teaching of design since it helps students to act as future architects and responsive civilians. First year studio has an important and critical role in architectural education since students must learn how to develop a new language in which they are not accustomed to. Entering the university, they face difficulty to think critically since pedagogical methods in high schools seem to favor mainly memorization. For this reason, it is crucial that critical thinking be cultivated for the fresh design students.

Important questions that are raised: What is critical thinking and how can be applied in architectural education? How do we teach our students in the first-year design studio to be critical thinkers? How critical thinking is related to crits?

Robert Ennis article "A concept of critical thinking" [4] is often considered as the starting point to the formulation of this complex and controversial notion. According to him, "[...] the ideal critical thinker is disposed to try to "get it right," to present a position honestly and clearly, and to care about others (this last being auxiliary, not constitutive); furthermore the ideal critical thinker has the ability to clarify, to seek and judge well the basis for a view, to infer wisely from the basis, to imaginatively suppose and integrate, and to do these things with dispatch, sensitivity, and rhetorical skill". [5]

The ideal critical thinkers, according to Ennis, have many abilities [6], some of them are to

- Focus on a question
- Analyze arguments
- Ask and answer clarification and/or challenge questions
- Judge the credibility of a source.
- Deduce, and judge deduction
- Make material inferences

- Make and judge value judgments
- Define terms and judge definitions, using appropriate criteria
- Integrate the dispositions and other abilities in making and defending a decision
- Be sensitive to the feelings, level of knowledge, and degree of sophistication of others
- Employ appropriate rhetorical strategies in discussion and presentation

In general, kinds of mental acts that can occur in a critical thinking process can be the following: *Observing*, *Feeling*, *Wondering*, *Imagining*, *Inferring*, *Knowledge*, *Experimenting*, *Consulting*, *Identifying and analyzing arguments* and *Judging*. [7]

Thus, to think critically is to think independently, to be able to articulate your own view, analyse and reason the connections between ideas, and consider new opinions with an open mind. A critical thinker is an active learner and not a passive recipient who communicates effectively with others in figuring out solutions to complex situations.

In the first-year studio of our School, a student-centered education approach is applied where students are considered as active participants in the educational process and the teacher acts as the "the guide by the side". To encourage the development of critical thinking skills and abilities of students a collaborative approach is adopted. Students, though working their projects individually, learn also through interaction with other students, rather than relying solely on the teacher's instruction. The contribution of collaborating learning to the development of critical thinking has been the focus of many researchers [8]. According to Nelson "Collaborations create opportunities for disagreements and misconceptions to surface and to be corrected. Collaboration also provides a vehicle for students to attain necessary acculturation to the college learning environment and helps to make tacit disciplinary expectations more explicit for students". [9]

The studio in our School is organized around three design-oriented exercises in the first semester and one project in the second semester in parallel with theory seminar topics with the aim to provide students with a conceptual framework for their design.

2. First exercise

It is entitled "See, Comprehend, Narrate, Express myself" and aims at cultivating the students architectural gaze. They visit a road or an area of the city and use sketches, photographs, even texts to narrate an architectural aspect of it. The exercise is not descriptive of an existing situation but a critical view of the city and its inhabitants. They explore more than their eye can see or their ear can hear. They are encouraged to see the city not as a physical construct but as a living organism considering Kevin Lynch view that "Moving elements in a city, and in particular the people and their activities, are as important as the stationary physical parts. We are not simply observers of this spectacle, but are ourselves a part of it, on the stage with the other participants" [10].

In this exercise, students apart from learning some basic skills and knowledge necessary to design, they develop their first ideas about the society and their role as moral citizens and as social individuals. The reading of the characteristics of the urban setting is a composite action and necessary to understand the elements that constitute the urban space where they are going to act as architects. Through this exercise each student must develop his/her personal way of "seeing" the world around him/her and imprint this view through sketches and other media. Drawing helps the development of their gaze and should be personal, critical and their sketches poetic aiming at the essence and not the superficial. As Paul Valery mentioned: "There is an immense difference between looking at something without pencil in the hand and looking at something while drawing it. Even the most familiar object to our eyes becomes completely different if we draw it" [11]. Thus, the exercise cultivates critical skills of students and their ability to look under the surface and understand the ideas behind and the links between. Previous year (2018-2019) exercise entitled: "*Anatomy* of the public space: Omonia square, Athens" aimed at directing students to explore, question and rethink the area in "section" that is, its underground layers. Issues such as "looking downwards", "repetitions", "people waiting", "abandonment", "5sec" are some of the students' readings.

3. Second exercise

It is based on the transformation of the cube - considered as a shape composed of six congruent square surfaces - through seven acts of cutting parts of it, abstracting and replacing them (Fig. 1). This exercise aims at exploring abstract concepts of void, edges, boundaries and apply transformative rules of reflection, rotation, bending and "translation"'; a mathematical term for sliding a piece in any direction. Before any transformative action, students must understand the inherent structure of the cube and analyse its geometrical and spatial characteristics.

Beforehand students were asked to transform in a short time (less than an hour) an A4 page without cutting it (Fig. 2). This introductory exercise, though difficult, aims at helping them to think quickly, discover, analyse and represent their idea. It is accompanied with discussions and comments that help them to compare, each other approaches. It assists them to face the same issues on a three-dimensional scale.

Overall, the second exercise encourages students to understand, develop and apply notions and enhance their ability to conceive and build abstract relationships which are important part of critical thinking. Additionally, it encourages independent and open-ended experimentation through models.

4. Third exercise

The third exercise introduces the human scale and focuses on issues of movement and light. The rest of architectural parameters are eliminated. Students conceive and design the movement within a space inscribed into an invisible rectangle (Fig. 3). The aim of man's movement in this space is to explore the works of an artist. Beforehand a list of artists is

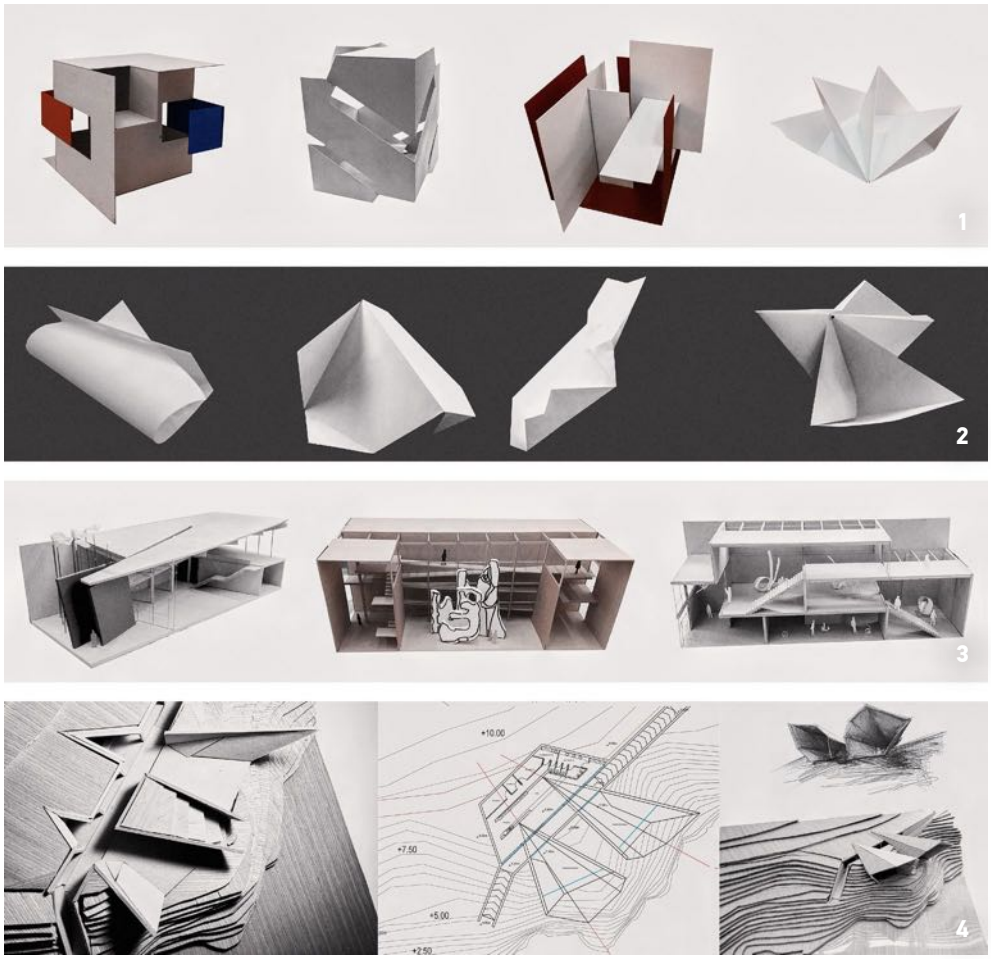

Fig. 1: (a) P. Karela, (b) I. Apostolopoulou, (c) M. Xalazia, (d) I. Sereka

Fig. 2: Paper transformations

Fig. 3: (a) K. Gournas, (b) E. Dikaiou, (c) P. Papaioannou

Fig. 4: Ch. Tremetousiotis

given to the students to choose from. They have to study the artists and justify their choice but mainly they have to explore the artists' syntactical characteristics and conceptual principles. They must move beyond the surface and introduce perceptive, personal insight. The exercise involves critical thinking since students "gather and assess relevant information, using abstract ideas to interpret it effectively and [...] use alternative systems of thought as a base for their design. [12]

5. Second semester project

It takes place during the whole second semester and introduces the place in the conceptualization of architecture (Fig. 4). This "locus-building" reciprocity is the most important aspect of this project. Students are prompt to demonstrate high order critical thinking e.g. the ability to analyse, evaluate and synthesize information and ideas. Furthermore, they start developing the design concept, capture the idea, or the essence, around which their whole design will be organized. The use of sketches and models are very important in this phase. Continuous experimentations lead them to explore and imagine alternatives, make a stand, a take decision (*prendre parti*) and get involved in tasks with reflective scepticism.

6. On crits

During the whole first year design studio the educational process is mainly based on cultivating students' critical complements and criticism plays an important role in this task. "From students' self- and peer-criticism and critical evaluation of precedents during the design process, to the formal, juried design critique as a means of examination, design education is imbued at every level with an instrumentalisation of critical thinking". [13]

Critique is important to the teaching of design assisting students to act as architects. The process of exchanging ideas and gradual improvement of student's projects through dialogue, advice, encouragement is enriched with the critique of other fellow students and with the contribution of intramural or extramural "actors" through organised crits. This process activates the critical thinking of the students. Though critical thinking is not the same as critique, both notions are interrelated since they involve argument and reflection.

Crit as a pedagogical and assessment tool dates from the nineteenth century *Beaux-Arts* School of Architecture. Its public form was formulated in the mid-twentieth century and since then has evolved into a variety of ways. This process is based on the student presenting design work to a panel of tutor, visiting critics and fellow students.

Though critique is applied in all design studios the initiation of first year students to this process is vital importance. "In an introductory design studio critiques may be arranged as group critiques to make students participate more actively in the design process, create a better medium for dialogue and to give opportunity to students to see many alternative solutions for the same design problem which makes them aware that there is not a single

solution to a design problem. In this way students can hear more critiques from different points of view both on their own works and the works of the others" [14].

In first year, studio in our School crits are organized at the end of every exercise and sometimes in an informal manner during the elaboration of the students' projects.

Intramural crits take different formats:

Peer dialogue and crit: It takes place between students. According to Piaget ideas of cognitive development and Vygotsky's concept of the 'zone of proximal development' [15] the cooperation between peers is fundamental for students to unfold their critical abilities and promote their ideas. This social interaction constitutes the necessary component of full cognitive development. Thus, importance is attributed to peer dialogue in the studio. Knowledge is fostered in the teamwork and the crit, developed within the studio through cultivation of multiple perspectives functions as a sound basis for the further development of their projects.

Tutor-student dialogue and crit: It takes place between the tutor and his/her students with the aim to provide them with feedback concerning the degree to which their design responds to the issues posed by the architectural problem they face and the ways they interpret them. Tutor's critique during the architectural studio is formative, supportive and should be specific. It helps students to improve their design and discuss issues of architectural discourse in general.

Intramural open crit: It takes place within the School with the participation of tutors teaching in the same semester. This type of crit is designed as an extension of the studio and as a way of instruction. It is participatory since it evolves all class and promotes exchange of ideas between students who are under supervision of different tutors. In this case students promote their learning capacity by viewing the processes and outputs of others. Also, it improves the verbal articulation of their ideas, their presentation skills, develops ways of supporting their views in front of an audience and exercise them as reflective practitioners.

Extramural open crit: It takes place within the School but with the participation of academics outside the School. It can either be an interim crit but most commonly it is final. Through extramural actors, students are assisted to develop a different insight to their design issues. Overall students learn how they can be developed into critical thinkers and receptors of criticism.

In our School, as opposed to a common practice applied worldwide, the crit is not a method of assessment of the design studio project. It is not connected with evaluation and students' marks, and as a result excludes students' anxiety. This type of crit is summative and helps students to develop their presentation skills –visual and verbal, to handle deadlines and responsibility and develop professional abilities by defending their ideas and thus contribute in expanding their critical capacities. During crits students are exposed to different approaches and are left free to support their ideas by themselves. In this way they are educated on how to defend their ideas. At this stage they are encouraged to comments on their fellow students work, however, usually they are reluctant to be engaged in this process.

The cultivation of critical thinking and the accomplished critical capacities, unfolding through crits, helps students in the process of passing from the stage of learning to be a professional. As Rachel Sara and Rosie Parnell point out: "The crit forms the primary narrative through which critical design thinking in architectural education is operationalized. The crit, 'design jury' or 'design review' inhabits a liminal space through which the process of learning architecture and development of professionalism are curated as a rite of passage".[16]

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Haptic & Visual Approaches

Model in 1:1 scale: Sensory Installations as the 1st Design Exercise

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Abstract

Since the 1990s, the Architecture and Urbanism curriculum at the Federal University of Rio Grande do Norte (Brazil) is based on the ideal of discipline integration, including the development (in selected semesters) of joint projects, whose content and theme involves most of the subjects taught in that particular semester. This interdisciplinary approach seeks to bring students closer to a holistic understanding of their future profession, ensuring the training of professionals with creative, critical, and generalist skills. Hence, it represents a qualitative improvement in pedagogical terms, resulting in the improvement of the teaching-learning process over the years. This paper presents the experience of such integrated projects with first-term students, which has been happening since 2016, and involves professors in three areas: design; representation/language; history/theory. The goal of this exercise is to develop a full-scale ephemeral sensorial installation using recycled materials. The estimated duration of the activity (design, assembly, and exhibition) is eight weeks. During this time, the students deliver: design sketches; model of the proposal in 1:10; plant drawings, cuts, and volumetric views; memorial of the work; and the execution of the installation in real scale (1:1), which remains in exhibition for about a week, followed by the final evaluation, which involves a discussion between professors and students. The different stages of the projects will be described and illustrated by photographs taken over the last four years. We further discuss how the method is used in the Project module, analyze the potential of interdisciplinary in student learning, and explore the importance of the 1:1 experience to stimulate the students' curiosity, creativity and research sense.

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1. Introduction

Across the last two decades, architectural education has been discussing a significant paradigm shift in design, especially in the first-year practices. Among the recent change, the literature points towards: interdisciplinary structures that enables a holistic approach [1]; teaching processes based in experimental learning [2]; and the recognition that the background of the new students needs to be more explored. [3]

This kind of approach relays on understanding instead of knowing and requires being active. Furthermore, it explores the ability to imagine, be creative and create projects based on sensations. The design exercises proposed at the beginning of the course should allow the expansion of the student's perception through the execution of experimental models in different scales. [4] The "experience prototyping" is a designing act that involves an interdisciplinary interaction between design, economy and experiences. [5] In addition, the manipulation of materials extends the student's ability to practice theoretical-experimental knowledge and develops its critical sense. [6]

Within this context, since 2016, in the first semester of the Architecture and Urbanism Undergraduate Course (AUUC) at the Federal University of Rio Grande do Norte (acronym, in Portuguese: UFRN), Brazil, the students developed an exercise to 'project and construct' ephemeral sensory installations at two scales: 1:10 and 1:1. The 'integrated project' (IP) seeks to put together the domains of creative imagination and sensitive reality by stimulating active practice. It is developed under the supervision of professors in three main areas: design, representation/language, and history/theory. Moreover, contributing to the repertoire formation of the future architects, the activity explores the students' background knowledge, as well as their notions of sustainability and environment perception.

This paper aims to presents the IP at the first six editions followed by the authors - between 2016.1 (February/July) and 2019.1-, specifically from the point of view of the discipline 'Space and Form 1'. To do so, the text: (i) begins with a brief commentary on the concepts of interdisciplinary and IP in the curriculum of AUUD/UFRN (item 2); (ii) presents sensory installations as an artistic movement, followed by descriptions of our exhibitions (item 3); (iii) comments on the development of the integrated project, discussing general aspects of interdisciplinary design methods and their contributions to our exercise (item 4).

2. Pedagogic Integrated Projects at the AUUC/UFRN

In Brazil, starting from the 1930s, the pursuit for the recognition of architecture as a profession influenced the foundation of schools, which sought a multidisciplinary approach, integrating arts, theory and technology. Thus, architecture became a field of generalist knowledge whose academic "disciplines" fragmented over time, according to the knowledge.

Despite this subdivision of content, most of the current curriculum is structured around the Architectural project discipline. [7] According to the literature, this curricular basis comes from the influence of the French, especially when it comes to activities carried out

in “ateliers”, or workshops, which allows the design to be guided by more than one teacher. [8,9] In this context, and incorporating principles of Bauhaus and the indications of Dewey, the AUUC/UFRN works with the concept of design integration. [10] According to this concept, the student should understand how to synthesize these multiple knowledges through practical and coordinated activity. This synthesis may involve the integration of architecture's disciplines (as design, technology, theory, history, representation, language, landscaping [11]), or assume interdisciplinary character, incorporating other areas of knowledge, such as Arts, Geography, History, Psychology. [12]

This is the curriculum strategy prevailing in the course of Architecture and Urbanism of AUUC/UFRN today, which is currently in its fifth version, known as A-5 curriculum (http://darq.ufrn.br/graduacao/), proposed during the discussion of the pedagogical political project of the course in 2006 - year of the National Curriculum approval guidelines for undergraduates. However, the pursuit of integration is not new, and has been a part of the curriculum since the 1990s – when the A-3 curriculum applied an integrated work model. This approach assigns a thematic focus to each semester, allowing joint assessments. This model happens in all academic semesters and at least in one evaluative activity, providing the association between contents and work of the disciplines, mainly articulated by the design component.

In the first semester of the course, the integrated work model is captained by the discipline ‘Space and Form 1’ (the first of the design concentration). The integration of the knowledge happens with the curricular components of Representation/Language (Architectural Drawing 01, Graphic Geometry 01), History/Theory (Aesthetics and History of Art 01) and Inter-areas (Methods and Techniques, Introduction to Architecture and Urbanism). This model started in 2012 and took on the current format in 2016.

Regarding other areas of knowledge (interdisciplinary conditions), the integrated project of sensory installations enables relationships with the fields of Ecology (concerns about sustainability and recycling issues) and Environmental Psychology (through the perception of the relationship between people and space, and how it offers stimuli to assign new uses to various objects, the affordance). [13] Although there is no theoretical background on these topics, they are worked in students' practices, because they are encouraged to recycle/reuse materials.

2.1. The phases and methods of the experience

With the coordination of the professor of module ‘Space and Form 1’, the proposal of installations allows the beginning of the formal study, presenting to the students the basics of creative exercise and contributing to the acquisition of an architectural culture. Thus, through experimental modelling exercises and their graphic representation, it enables students to perceive the dynamics of transforming space and, consequently, acquire notions of scale and aesthetics.

In general, the design exercise takes place during eight weekly meetings of 3.5 hours in Space and Form 1 classes where a professor and a tutor (usually a graduate student) assist about twenty students. These weeks are divided into conception of the proposal (4 weeks),

assembly (3 weeks), and exhibition of the installation (1 week). At the end of each phase, an integrated evaluation happens, with discussion among all involved professors and students.

The conception of the installation takes place in four weeks, where the first week is used for clarifying the proposal and exposing references that stimulate the interest of students. In the following two weeks, the classes take place at the intervention site, and they are dedicated to the conception, discussion and dimensioning of the proposal.

The professor and the tutor behave as guides, whose role is to role of the orientations is to help and question the chosen approaches and materials, as well as clarifying doubts and reducing uncertainties, promoting reflections on the product. During the process, students make sketches and develop the physical model of conception (scale 1:10), which involves the notions of scale and spatiality (Figure 1). During the activity, the body of the students are used as the basis for sizing, and the knowledge and the drawing of human figure are fundamentals.

Each group prepares the model by predicting circulation, structure and lighting strategies, and representing the materials on the real scale (Figure 2). In terms of integration, other components may request complementary products, such as artistic and technical drawings. The evaluation includes the presence of professors, who enquiry about details, suggest modes of senses management, and recommend alterations to increase the viability of execution. In the fourth week, the presentation of the model and the sketches close the stage of conception and guide the making of constructive decisions.

In the next four weeks, the professors keep up with the preparation for development of the installation on real scale and clarify difficulties of perception and bi-/three-dimensional representations. The use of sustainable support materials to develop the solutions, especially recycled materials, is encouraged, causing a diversity of structural and closure components. The work is developed in groups, resulting in three to five installations per exhibition. The teams are encouraged to explore at least two human senses and occupy any place in the atrium of the building hosting the architecture laboratories of AUUC/UFRN (Figure 3), with a minimum used area between 4m^2 and 6m^2.

The assembly (2 days), exposure (3 days) and disassembly (1 day) happen in the same week. The opening of the exhibition takes place at night to accommodate the use of lighting effects. At the time, the groups present the result of the “model in 1:1 scale”, delivering the descriptive memorial (commenting on the intention of the proposal) and the graphic material. As first guests, professors and colleagues explore the environments and experience their sensations. During the disassembly, each group is responsible for the disposal of the materials and cleaning the site. At the beginning of the following week, a general evaluation takes place between teachers and the class, for a balance of experience, their difficulties and curiosities.

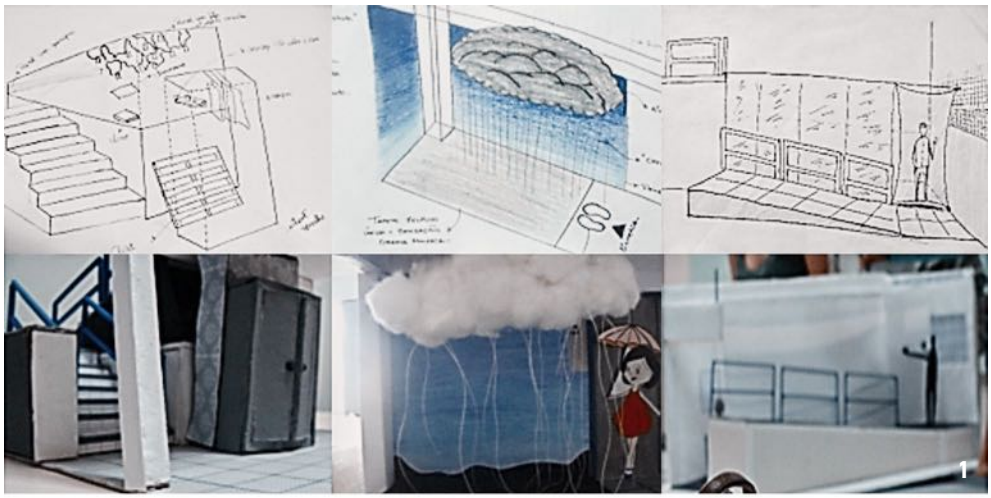


Fig. 1: Examples of corresponding sketches and physical models.

Fig. 2: Examples of models in 1:10 scale.

3. Sensory installations

As an artistic work, a sensory installation involves the people who enjoy it, providing the experience of interacting with its elements. The sensations provoked (tactile, thermal, olfactory, auditory, visual, and kinesthetic) may be real or illusory, as well as pleasurable or uncomfortable, influencing perception. Therefore, the presence of people is fundamental, because each observer must reflect and draw his own conclusions about the experience. These "active participants" need to interact with the space through the journey and contemplation, experiencing new sensations while moving. [14,15]

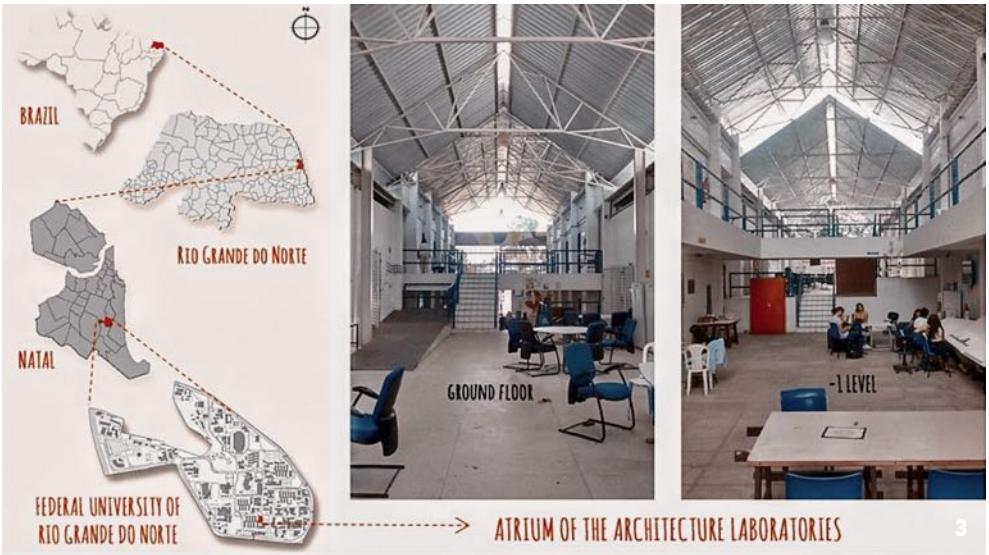
Originally from the late 19th and early 20th century, these are movements such as Dadaism, Surrealism, Minimalism, Pop Art and Conceptual Art. [15,16] At the time, the space became incorporated into the condition based on the recognition of the multidimensionality of artistic work and the smallest separation between painting and sculpture. This provoked an increase in the awareness of the artists about the role of the architectural space in the perception and enjoyment of the art objects. [17,18] However, only in the 1960s the term was internationally disseminated (and the 'krafts' was recognized as artistic manifestations. Today it is represented by urban interventions. [19] In the international context, the main examples of artists recognized by their work in this area are Kurt Schwitters (Creator of' "Merzbau", in 1923, considered the first artistic installation), Marcel Duchamp, Andy Warhol, Claes Oldenburg, George Segal, Christo e Jeanne-Claude, Louise Bourgeois, Anish Kapoor, Jean Tinguely, Rachel Whiteread, Nan June Paik. In Brazil, among its leading exponents are Hélio Oiticica, Artur Barrio, Frans Krajcberg, Henrique de Oliveira, Lygia Clark and Cildo Meirelles.

As a mirror of contemporaneity, the installation reflects on conventional art, has experimental character and does not allow a single material. It is characterized by: i) appropriating the surrounding space; ii) having ephemeral character; iii) allowing a wide variety of materials and supports to combinate various languages (drawing, sculpture, light, color, sound, video, photography, dance, computer graphics); iv) promoting the production of meanings, arousing the critical gaze of the observer.

Because they are creations with a quick assembly process and easy destruction or reconstruction, the elaboration of installations is a theme suitable to work with architecture students at the beginning of the course. Among its advantages to enrich the learning process are: i) stimulates creativity; ii) allows them to change the production of space; iii) enables them to observe the effects of their decisions on visitors.

3.1. The installations

In five semesters, the authors keep up with 24 sensory installations, all of which executed in the atrium of the Architecture Laboratory. In volumetric terms, most creations (17 of them) proposed rectangular prismatic structures that promoted closure in two (1), three (1) and four (15) planes, with single entrances (12) or doors in the extreme walls (5). Some installations present diversified shapes, which allowed different routes such as: hexagonal, with entrance and exit through the same opening; cylindrical, with the trunk of a tree acting



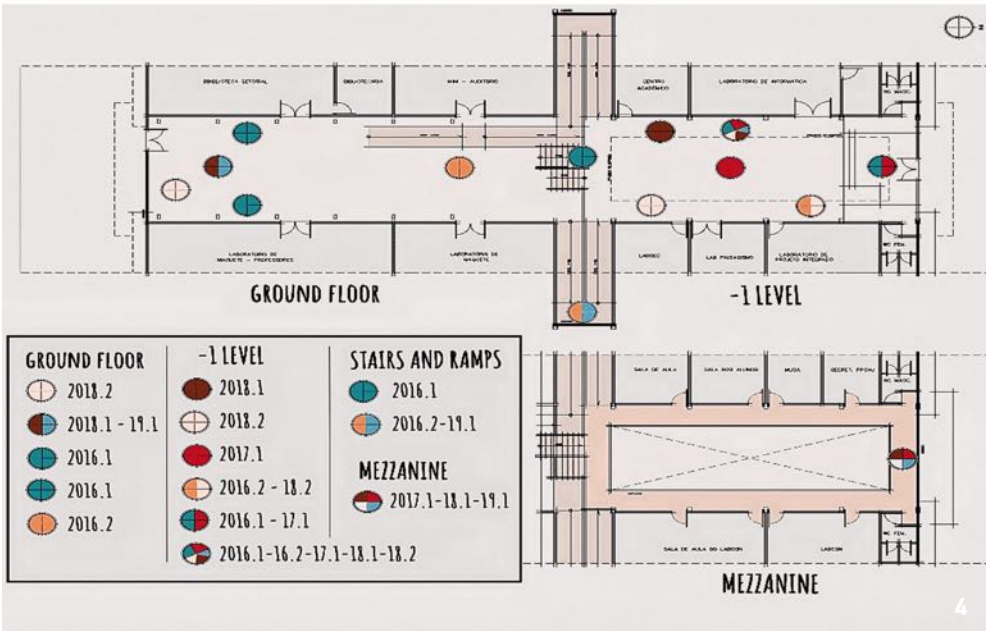


Fig. 3: Images and geographical location of the Architecture Laboratories.

Fig. 4: Spatial distribution of the installations in the atrium.

as a portal; cone frustum made of tensioned fabric tied to the truss of the roof and with a rip as a door; and spherical, imitating a geodetical form.

Thematically there was a tendency to promote specific perceptions, linked to: use of sensory receptors (eyes, skin, ears, nose and mouth, in that order); psychological reactions (relating to Dark / Bright dichotomies, pleasure / displeasure, fear / attraction, monotony / surprise). From the point of view of meaning, it's possible to group the installations in five themes:

- life cycle (2 works), through multiple sequential settings;
- urbanization (3 works), accentuating the discomfort of problems in the city, such as consumerism, deforestation, pollution and traffic;
- socio-spatial behavior (7), which allowed users to modify the space or be seen when exploring it;
- health and disease (5), dealing with the care of the body and mind or encouraging the user to play the role of someone with problems / health disorders; and
- violence/fear (7), which, in dark conditions, provoked the need for the user to move away from the situation, while requiring them to pay attention to the elements and objects.

Their spatial distribution in the atrium (Figure 4) demonstrates the diversity of places and the articulation of the proposals with the atrium areas of circulation and conviviality: half (12) of the works concentrated at the lowest level of the atrium (-1), taking into account the constructed elements of the space to assist its composition.

Only one installation located at -1 level, not having vertical planes, used a thick net to delimit its area in the middle of the atrium. On the ground floor, because of the double height, the six groups that opted to make enclosed structures adopted self-supporting mechanisms to ensure the support of a higher plane, such as a hexagon, sphere, cylinder or cone. In the areas of vertical circulation, two creations were set in at the ramp between the ground level and the basement, and another under the stairs, taking advantage of the format of these spaces. In the mezzanine, three groups chose to use an area that occupied the available space between the railing and the hollow brick wall.

3.2. The materials

Because it is a temporary exhibition, the adoption of recycled materials (Figure 5) was incentivized, because of its low environmental and economic impact, and because it enables a variety of combinations and arrangements. In general, the materials most used for the structure were wood slats and panels, usually discarded by constructions. Moreover, many groups used tensioned fabrics such as meshes (more opaque and flexible) and muslins (translucent and low cost).

Other recycled elements used for structure were metal bookcase without shelves, adhesive tape body, cardboard boxes, broom cables, printed-paper tubs and pipes (Figure 6). Among the most curious components is a wardrobe without the rear closure panel, used as a portal (Figure 7). When the installations had some kind of internal transition, they were vertically

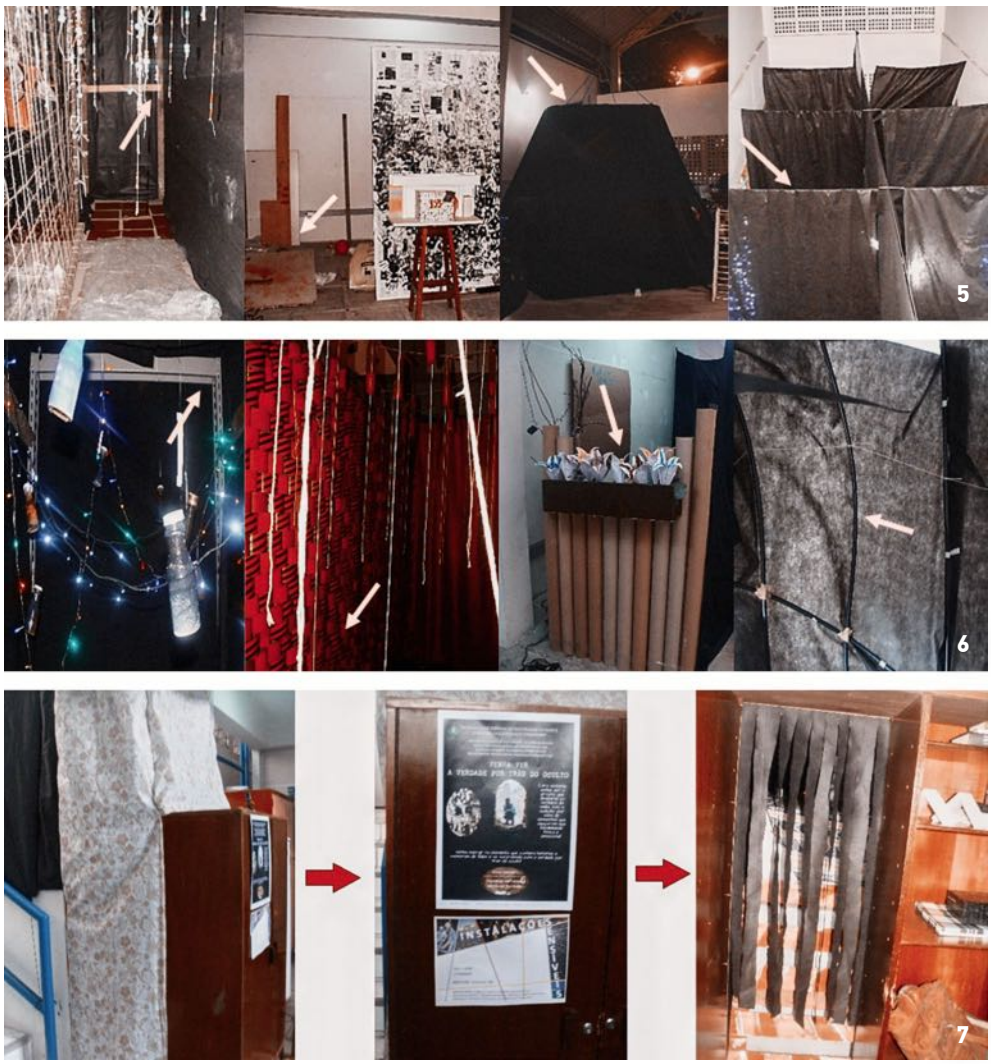


Fig. 5: Examples of most used recycled materials for structure.

Fig. 6: Examples of other recycled materials.

Fig. 7: Wardrobe used as a portal.

marked with recycled materials such as nets, Compact Discs, paper or fabric curtains (Figure 8). To mark the path, students used stones, sand, tree leaves, plastic and carpets (Figure 9). For external planes, they often use panels (colored / monochrome) and agglomerated compositions combining triangles, rectangles or graphics motives (Figure 10).

4. Reflections and Conclusions

The design strategies used in the installations elaborated by the students usually showed closed spaces (about 92%) and controllable microclimates. Unsurprisingly for beginner classes, there were still struggles in the execution and finishing of some structures. However, with professors suggesting solutions that are less demanding in terms of feasibility, most proposals had a good level of finalization.

The execution of projects in scale 1:1 (but without the constructive requirements of other architecture projects) promoted physical sensations, reflections and awareness of visitors. In addition, the experience enabled students' self-awareness about their own interests and ideas to be explored in the following semesters, such as architectural programming, materiality, constructability, feasibility of the proposal, construction tectonic and others.

The proposal to integrate curricular components promotes a rich production of graphic materials, streamlines evaluations and allows students to understand the need to work the architectural project in conjunction with various areas of knowledge. The use of recycled materials expands the perception of the first-year students and promotes the effective practice of sustainability. By proposing new uses for everyday objects, it incites their creative imagination and active search, assisting the consolidation of the design repertoire and promoting the interdisciplinary work.

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Fig. 8: Examples of materials for internal transitions.
Fig. 9: Examples of materials for paths.
Fig. 10: Examples of external panels.

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Visual Design Methods in the 1st Year Architectural Studio

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Abstract

The paper is going to argue that images can become active agents in producing design ideas, rather than passive records of them. The use of an explicit visual strategy treats representation as being able to function prior to conception, giving to it order and meaning. By contrast, the tacit assumption of a visual strategy treats representation as a part of the background knowledge, a neutral transparent medium that allows the student to engage directly with buildings and spaces from his/hers image bank. When a first year student, who has no architectural background, is faced with an "architectural brief" very early on, he/she has no alternative but to reproduce preconceived models. However, architecture is a new language that a beginner needs to learn. Because he/she is not familiar with the language, these preconceived models are often images devoid of architectural concepts. It is therefore important to introduce a design method that challenges the student's background knowledge. By the use of an explicit visual strategy in the project from day one the implicit reproduction of preconceived image can be avoided. Visual design methods involved in the first year teaching are grouped under two broader categories: Architectural images are introduced to the student. He/she uses these images to recombine or restructure them through the transformation of geometrical configurations and forms in order to create space. Understanding the structure of the spaces precedes the creation of it. Extra architectural images i.e. paintings, body parts etc. are introduced to the student. He/she transforms these images by the use of different techniques (photography, collage, tracings, etc.) to create space. By the development of free associations, the creation of space precedes the understanding of it. In both approaches the use of architectural "primary elements" allows the student to engage in a metaphoric shift and create space.

1. Introduction

Unless otherwise stated by the brief a first year student that is asked to design a small space, starts with a blank paper and his/hers design is mentally conceived. As a first year student cannot yet think spatially or architecturally the background knowledge or the assumptions that this student possesses play the main role in the above process. Background knowledge is recruited from a much wider repertoire of knowledge, from the student's total knowledge base. This includes mainly spaces that the students are using in their everyday life, spaces that they visited or have seen in films, magazines etc.

The first year curriculum always includes exercises that address the student's background knowledge. A typical exercise asks from the students to reproduce the house they are living in, or to record by photographs or drawings their living area or their city. These exercises aim in revealing and redefining in a rational way (by criticism) the uncritically possessed architectural background of the student. They operate mainly on the analytical level and not on the level of design, of architectural expression, that means they do not provide the student with a design method.

The paper is going to discuss the necessity for a first year brief to introduce visual images or to indicate sources of visual inspiration to the students. Thus the students are able to choose and explicitly use and manipulate images that will facilitate their architectural expression. The paper will also examine the value of visual thinking i.e. 2-d and 3-d representations and the use of 'primary elements' within architectural education and the role of representation in initiating design ideas in the first year studio.

2. The Role of representation in initiating Design Ideas

Drawings have always been perceived as representations of architectural space, as means of communication, which are expected to be visually attractive. An architectural idea has always been seen as the outcome of an extended graphic development. During the course of teaching first year, drawings or images can become active agents in producing design ideas, rather than passive records of them; visual thinking can precede verbal thinking. Visual thinking (expressed by drawings) and verbal thinking are two different kinds of thinking.

Piaget's [1] (1959) syncretic perception corresponds to visual thinking. Syncretism is the negation of analysis and it moves from the whole to the parts. As with visual thinking in syncretism the whole is understood before the parts are analyzed. According to Arnheim [2] (1969) visual medium is superior to verbal thinking, because it offers structural equivalents to all characteristics of objects, events, relations i.e. readily definable patterns. Visual thinking appears to be more intuitive, didactic and more relate to the whole, in the sense that the whole is understood before the parts are analyzed.

Verbal thinking is more explicit, analytical and rational. Visual thinking is mainly implicit; it is a more "subjective synthesis" than verbal thinking, which presupposes analysis. Our mind moves from the whole to the parts in a dialectic relationship. We can claim that in

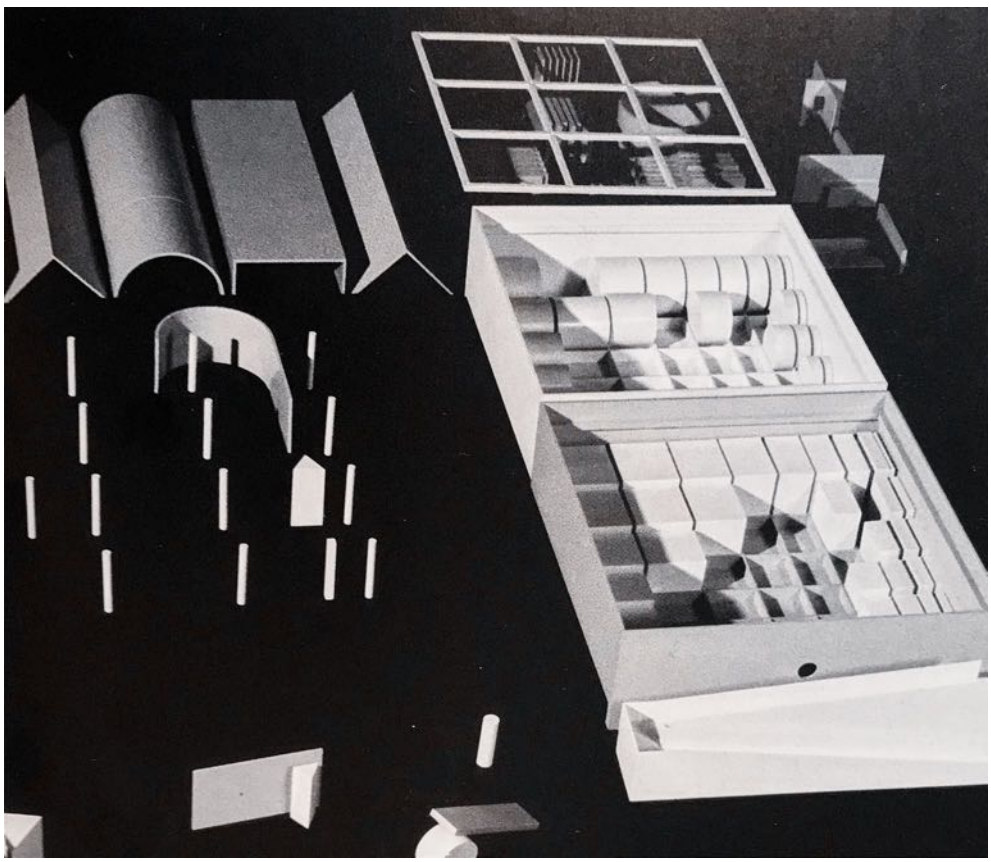

Fig. 1: 9 Square Grid in "Educating an Architect" p.p.12-13

visual thinking every new perception is connected with what immediately precedes it in a uninterrupted way. It is very indicative for example the way we perceive and experience space in a continuous sequential way.

The need to discuss visual thinking comes from the importance of its operation within the architectural studio [3]. The importance of visual thinking stems also from the belief that thought is inseparable from the medium through which it is formulated and expressed. Vygotsky [4] (1930) argues that if one changes the tools of thinking available, the mind will have a radically different structure. The linkage between tool use and speech influences cognition. By analogy, the use of different design mediums expressively chosen, determine the development of design and thus architectural representation becomes part of the design process. Representations, understood as discursive concepts, should not be equated with mental copies or images. They possess, in equal measure, a cognitive or mental aspect and a material aspect. The use of an explicit visual strategy treats drawing (model making or any 'kind' of representation) as being able to function prior to conception, giving to it order and meaning. By contrast, the tacit assumption of a drawing strategy treats drawing (or model making) as a part of the background – a neutral transparent medium that allows the designer to engage directly with real objects and spaces that are considered to make up the design task. In the explicit formulation of a visual design strategy, the designer takes responsibility for the drawing and model making process and for those issues that will contribute to architectural form.

The representation of the architectural space involves a series of characteristics that are effectively distancing it from spatial reality. What is happening is described by Ricoeur P. [5] (1981) with the word 'distantiation'. Representation addresses anybody that can understand it and 'decontextualises' itself opening up to unlimited series of readings. The experience of space is determined by a shared reality, which no longer exists on the level of representation. Therefore representation has a metaphoric referential dimension which is of a different order from that of experiencing architecture, a dimension which is unfolded in the process of interpretation and conceptualization. It serves not simply to translate finished thoughts into visible models, but is also an aid in the process of working out solutions of problems. Thus representation becomes suitable instrument for abstract reasoning.

3. 'Primary Elements' in first year projects

Visual thinking can take an active role in initiating design ideas but it cannot operate in a void. 'Primary' architectural elements are the ones that facilitate visual strategies in the process of designing. As we have already stated in the introduction, students arrive in the first year studio bringing along their background knowledge. Background knowledge does not function just on an intellectual level, but at the level of visual representation as well. Any form of architectural element or type i.e. tower, atrium etc. any concept of function i.e. bedroom, walking etc. can be part of the form function complex of background knowledge of a specific structure. The student's image bank includes mental images relating to the everyday use of objects, primary elements and types. Due to these images that have been

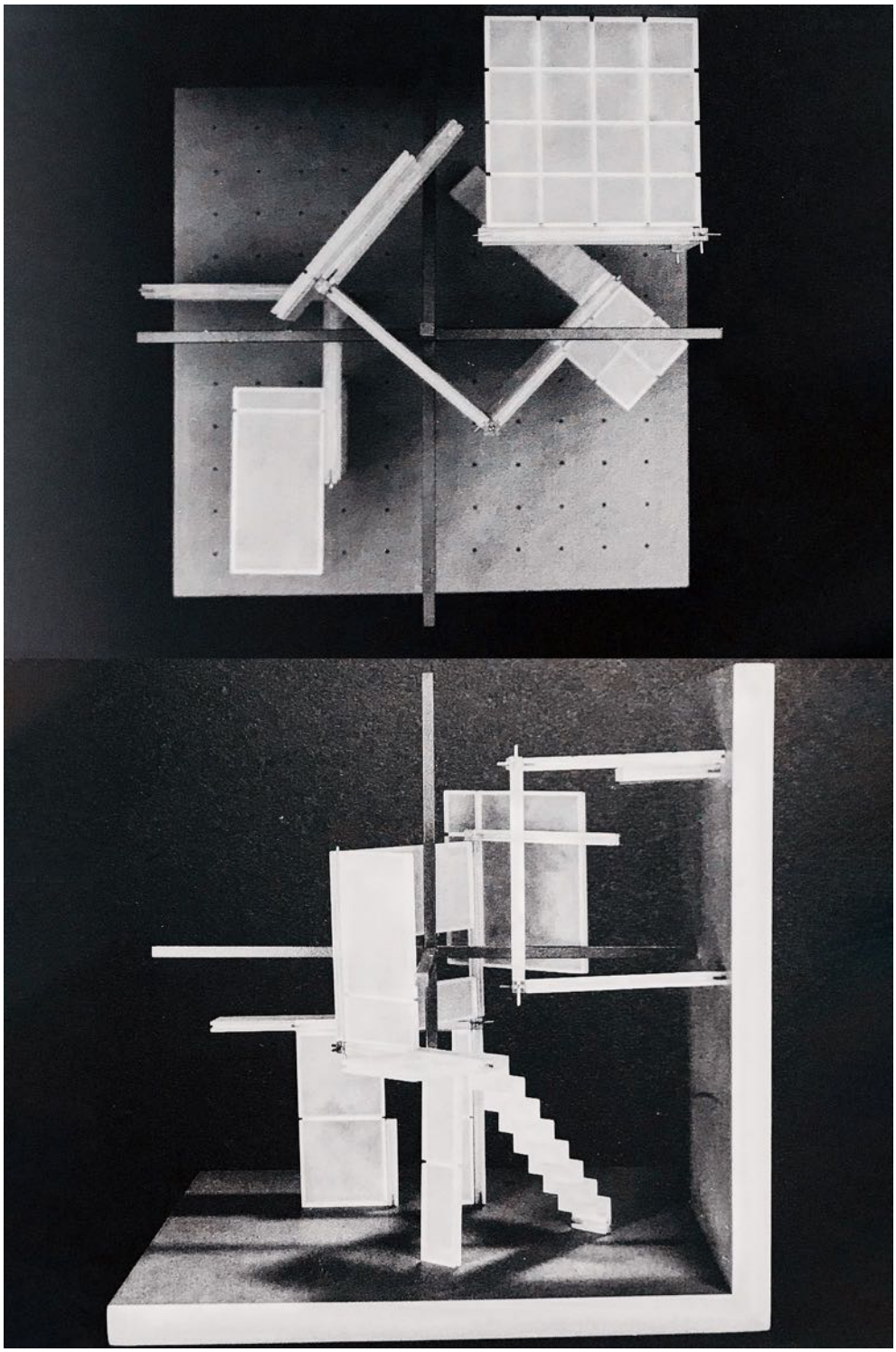

Fig. 2: The Cartesian House, in "Educating an Architect" p.25

internalized through the student's idiosyncratic filtering of experience, the tutor is able to communicate with them by sharing a fragment of common knowledge that can build upon i.e. everybody knows what a staircase is, a wall, or a window etc.

The structure of primary elements is essentially spatial, not containing any polemically defined set of historical elements. A 'Primary element' can most simply be defined as a concept that describes a group of objects characterized by the same spatial structure. It is fundamentally based on the possibility of grouping objects by certain inherent structural similarities or differences. It might even be said that 'primary' element means the act of thinking in-groups. A 'Primary element' is abstract in the sense that it contains geometrical, spatial, material and functional properties at an elementary level. For example, a wall is horizontal, linear, structures and offers boundary conditions. In order for a 'primary element' to be recognized as such, two operations must take place within the student's image bank. The first is forming classes under a common 'family' name i.e. all walls, all balconies etc. and the second, forming classifications by singling out certain common attributes (similarities, differences) within the class itself i.e. transparent walls, brick walls or across classes i.e. a (concrete wall), balcony, column etc. Similarities and differences operate in relation to function, structure, texture, form and spatial properties.

The use of 'primary' architectural elements is apparent in the first year discourse independently of the design method used as one can see in "Educating of an Architect" [6] published by Cooper Union in 1989. Part of the design process, being experiential or analytical is the selection and the combination of 'primary elements', for the creation of an individual proposal. A 'primary element' for the design language, becomes the equivalent of the word in a text, as it constitutes the smallest conceptual component of it. The introduction of the use of a specific 'primary element' during the design process is the equivalent of the introduction of a 'word' as described by Vygotsky [7] (1934) in the thinking process of the child. It is of great importance for the project. It helps the students focus primarily on the visual level and translate their idea into the intellectual level.

The metaphoric shift between visual/intellectual can take place by the introduction of an object that does not belong to the class of the 'primary element' under use and its translation into architectural element i.e. tree as colonnade, car as wall, window as camera. It can take place as well by the positioning of the 'primary element' under different classes i.e. roof as balcony, an elevation like a wall, a window as a door etc creating a shift in our perception of the element. In this way 'primary element', albeit being a part of background knowledge, can take part in the creation of the design. 'Primary element' can thus be thought as the frame, within which the metaphoric shift operates the design force of any teaching method.

4. Visual Thinking in first year design

Experience and research results on the first year teaching [8], indicate that design methods that operate primarily on the level of representation, have a tendency to be grouped under two broader categories: the analytical cognitive ones, and the spontaneous figurative transformational ones.

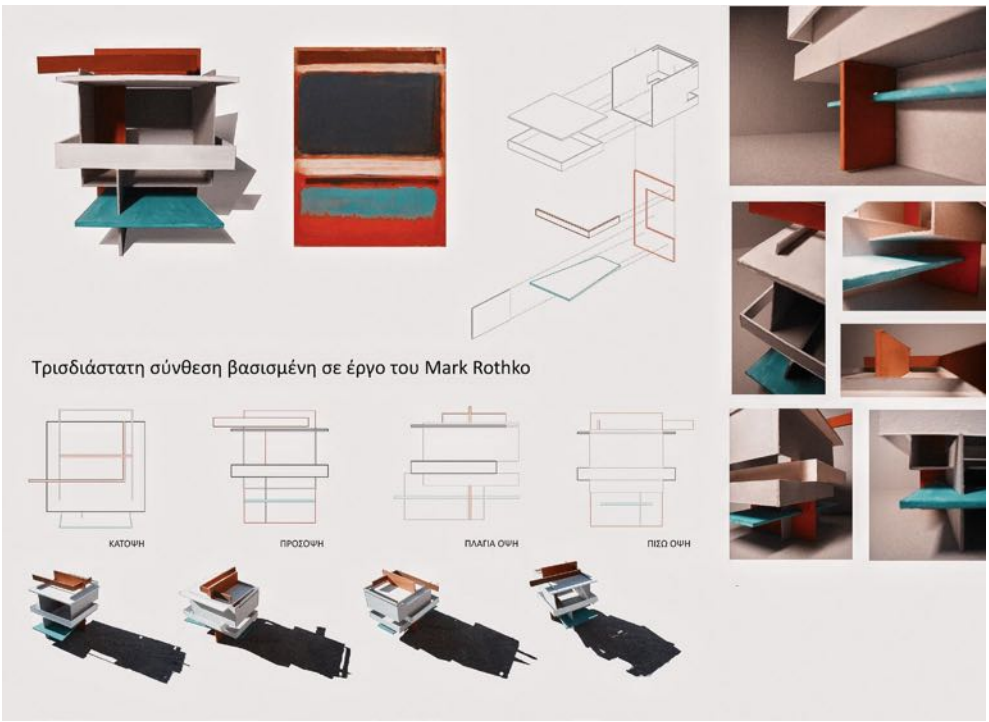

Fig. 3: From painting to space-visual transformations, NTUA 2013-2014

In the first group architectural images (containing 'primary elements') are introduced to the student. He/she uses primarily these images to recombine or restructure them in order to create space. The visual understanding of architectural space is arrived at, through the transformation of geometrical configurations and forms. The student studies not just the 'primary elements' of architecture, but the mechanisms of combination of those elements, in order to understand how changes in the structure or programme must affect form. Considering form in its syntactic capacity, one sees it to be ordered according to specific laws internal to architecture and not derived from notions that are borrowed from other disciplines. Here the approach works mainly on the formal architectural level and is self-referential, analytical and systematic. Under this group fall the briefs: (a) 'design in the manner of', (b) analyze the houses of i.e. Le –Corbusier (c) recombine the following architectural elements: a wall, a grid, columns and produce a space.

In the second group, extra-architectural objects and images are introduced to the students (everyday objects, mechanical objects etc.). The formation of architectural concepts is helped by the introduction and transformation of concepts borrowed from extra-architectural 'worlds' or events (i.e. the world of modern art, of theatre etc.) The visual understanding of architectural space is arrived at, through the transformation of visual materials, generated by the student's first hand experience or intuitive perception of the world. This approach works mainly outside architecture it is contextual, experiential, individual and expressive. Under this group fall the briefs that introduce an alternative world of images to the student: (a) 'design' a space for an artist through the transformation of a painting etc. (b) 'design' a space for your favorite object etc.

In both approaches the students transform the images by the use of different techniques (photography, photocopy, tracings, etc.). While the images are transformed step by step, the students use 'primary elements' that allows them to engage in a metaphoric shift and create a space. In both approaches a student can develop two types of visual strategies that are not mutually exclusive. In the first one he/she reads the representation in terms of its internal relations (explanation). In the second he/she do not find something hidden behind the representation, but something disclosed in front of it; not the intellectual constitution of the representation, but that which points towards a possible world (understanding). To understand the representation at this level is to move from its sense of reference, from that which it says to that which it says about.

For example if the students use the image of an architectural space or of an object i.e. a guitar, in the beginning of their project they can develop two different visual strategies. In the first strategy the students think about different spatial qualities (of the space or of the guitar) and they try to understand the structure of 'primary elements' in order to explain the image. The transformation of the image is the outcome of a spatial analysis. In the second strategy the students use the image per se for what it presents in totality and transform it by the use of different techniques in a creative way. The process is mainly unconscious and the metaphoric lip to a space is facilitated by 'primary elements'. The students can follow both readings within the same process. Usually for first year students architectural images tend to be explained and extra-architectural images tend to be understood.

5. Conclusion

In order to teach first years how to design it needs to be acknowledged that the nature of representation is very crucial in the process of learning architecture. Representation, treated in an active way, confronts the very act of knowing and concept formation. Thinking has generally been identified with language cognition up to now, and within it, the role of visual thinking has generally been conceived as subordinate. This was due to the unpredictability and implicitness of visual thinking. The explicit use of representation elevates visual thinking operations to those of verbal thinking. In the design process, with every change in the means of representation, a transformation of what is in hand occurs, producing a new proposition to be further transformed. It is important to recognize that the final design does not appear all at once, but it requires a process that involves step-by-step transformations. Within the interaction that takes place amongst the representation and intellectual thinking, incomplete concepts and partial forms are produced randomly and intentionally. A method that stresses the role of representation in the first year is offering:

- The ability to generate a richness of visual materials which stimulate the imagination and lead to the design of an architectural space. This is encouraged by asking the students to explore a variety of media and materials: film, photography, models, collages, overlays, drawings, paintings etc....The result is an early development of a rich formal vocabulary leading to an experimental approach to architectural design. The students gain confidence in their ability to work on the visual realm with a sense of purpose, prior to the acquisition of an architectural syntax. The process almost always leads to the representation of an innovative and evocative architectural space with a sense of scale.
- The ability to explicitly choose specific visual strategies in the design process (ability to control the design process). By putting an emphasis on the process rather than on the product, the student is asked to carefully consider the next move, the next trans-formation. Is it going to be a model? A shadow projection? The student-designer becomes more and more responsible for the process and more critical of it, and paradoxically, he is less afraid of int uitive responses, he can explicitly choose to explore them as well.
- The development of interpretative skills. The images and artifacts produced along the transformation processes are often the result of metaphoric thinking and can be interpreted in many different ways. The students become familiar with the manipulation of ambiguities, contradictory elements and uncertainties, in an attempt to coherently clarify their design intentions. This requires an open mind and fluidity in the interpretative skills of the designer. The unpredictable nature of the process means that each step is both a clarifications of an idea as well as an exploration towards new possibilities.
- The ability to purposely acknowledge and use an “experiential framework” as a meaningful design generator. The brief does not necessarily ask for conventional measured drawings. In that way the students can experiment with the use of a variety of innovative representational techniques. Experimentation thus becomes part of a meaningful design process.

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Model Making: The Continuing Role of the Physical Prototype in Early Design Education

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Abstract

The physical prototype is considered a representation of reality where students can experience enhanced interaction with their ideas and concepts from experimentation through to final design. A two phase assignment entitled; 'light me up' documents physical modelling through a playful trial and error approach. The overall process provides visual tools to reveal elements of form, texture, volume, scale and light, permitting students to creatively present working prototypes which communicate their ideas to a high standard. Implications of the case study allow insight into playful methods of model making for first year design students, exploring the continuing role of the physical prototype within design visualisation, despite the increase of available technology. With a focus on exploration and playfulness this paper summarises that once the language of design is understood, students can then continue to 'play' with technology.

Keywords

model making / lighting design / physical prototype / playful learning

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1. Introduction

We now live in a cultural and social revolution brought on by technological developments [1], as a result we see mediums of architecture and interior design transforming rapidly. This change allows us to enrich and enhance learning experiences, but it is questionable that we are beginning to lose our perceptions of the physical setting? In first year design education we regularly observe enthusiasm of students to proceed directly to digital production to avoid working by hand. It is crucial to the profession that practitioners are highly skilled in three dimensional modelling, yet, is it possible to produce effective expert outcomes without first understanding fundamental design principles?

"Our central skills of communication develop at a young age where play is a major contributor; in a globalised world, play is increasingly becoming interactions with virtual space rather than the physical" [2]. As children we play with 'learning toys'; shape sorters, stacking blocks, puzzles and most famously Lego. These games are physical elements which enable us to understand the physical world, allowing children to develop concepts of space, form, volume, depth, materials, texture, size, scale and colour, nevertheless, all children see are forms of 'play'. Without fundamental three dimensional skills we would not be able to successfully live, work and move within the spaces around us. Relating these concepts to early year design education, students must be provided with a similar base to enhance knowledge of space in relation to form, line, colour, texture and light, amongst many others.

To demonstrate the continuing role of physical prototypes in early design education a commentary on a two phase design project taught within the programme of Interior Design at Frederick University is displayed. 'Light me up' is a project brief designed to allow students to identify with possibilities of light, aiming to establish both creative and practical skills through prototype lighting fittings. In the first phase students are provided with variations of white paper to creatively explore physical effects of lighting upon objects as well as the space which it encounters, thus encouraging innovation and diversity in design amongst peers. Once students understand lighting effects, construction, volume and scale they gain sufficient skills to move forward to more complex material experimentation. During the second stage students playfully explore the initial prototype with a range of materials allowing for a development in skills, permitting students to creatively present working prototypes to a high standard.

Through a playful perspective to learning and teaching the course follows a student centred methodology, providing students active roles in learning and design processes. Once students fully understand principles of physical model making they gain sufficient knowledge to continue to technological environments of recent decades where at an advanced level they experience interplay of two dimensions, three dimensions and computer modeling, commented by Elizabeth Diller "when one goes directly to computing then you are actually not thinking" [3].

2. The physical prototype

The physical prototype is considered a reflection of reality where students can achieve enhanced interaction with their concepts from experimentation through to final design. Gursoy explains that "a model is considered as a representation tool and therefore can be noted important for communicating information within many disciplines" [4]. Whether a three dimensional sketch, developmental model, design prototype or scale version, all are considered vocabulary of design education. Models are used to express ideas, research and investigations, or as a summary of thoughts which can be continually referred back to in order to aid conceptual development [5]. During a student case study of model making within early interior design education, Merry and Daniel [6] questioned; if students bypass the fundamental skills of physical model making would this affect the imagination and creativity? Furthermore enquiring if students could continue to deliver original and successful solutions without physical models? In conclusion the paper highlighted; without basic skills there is potential to lose a sense of composition, layout, materials and volume, all of which accumulate in a stronger proposal. In agreement, Wetzel [7] advocates; we must merge expertise, ability to experiment and visualisation skills to integrate architecture and structural design through 1:1 prototypes. As a teaching methodology Wetzel [7] promotes large scale installations as vital to the educational process.

The use of technology in early design education creates diverse opinions amongst professionals and educators. Charlesworth [8] investigated student uses of both of both virtual and physical modelling during design development, the study resulted in support of physical techniques and value of sketch models. Charlesworths research concluded that virtual techniques had little or no significance as a stimulus for idea creation. Conversely Solimans [9] in depth survey into appropriate teaching methods and learning strategies placed the physical model as a mere presentation technique and not as developmental practice. The study showed that techniques of 3D virtual modeling and 2D sketching ranked higher in the opinion of design educators. Despite the results of this recent study Daniel and Merry [6] remind us that it is important to consider that every model has a particular use dependant on individual project requirements, without a physical model the final object will only ever be the first prototype.

3. Case study 'Light me up'

'Light me up' takes place during the subject of Lighting Design 1 within the program of Interior Design at Frederick University, Cyprus. As a course the program shifts towards an Architectural orientation which is enriched with a broad Fine Art context. Lighting Design 1 introduces basic lighting theory, allowing students to identify with the possibilities of light. Furthermore students obtain skills in prototype making through the production of contemporary lighting fixtures (Fig 1). Physical model making is approached as a vocabulary of concept and trial product development with a focus on exploration and playfulness. Through a playful perspective to both learning and teaching the course follows a student centred approach.

3.1. Playful Learning

Play is a major part of human development; humans are naturally playful beings [10]. During childhood we experience play in a variety of forms, but when analysing the physical object we interact with objects such as shape sorters, puzzles and most famously Lego or building blocks [11]. These elements enable us to understand the world around us, allowing children to develop concepts of space, form, volume, depth, materials, texture, size, scale and colour. 'Serious play' is a common term within the discussion of adult play, implicating that play has serious outcomes, be it a task, to boost creativity and in many cases induce pleasure [12].

Large scale corporations, such as Google and Apple incorporate play into their corporate culture, in direct correlation Elkind [13] outlines various studies displaying the relationship between employees enjoying what they do and the quality of work produced, thus advocating an integration of play back into everyday life. Contrasting concepts of 'serious play' to early design education, students can be provided with a similar base to enhance their knowledge of space in relation to form, line, colour, texture and light, amongst others. Play permission provides an ability to remove rules, allowing freedom of creativity; rules come later [11]. Furthermore play has the ability to facilitate divergent thinking which fosters development of the cognitive process important to the creative act [14].

3.2. Project Structure

During the initial stage of 'light me up' students are required to get familiar with products available in the market documenting information on various lighting design producers (Eg. Erco/Flos/Foscarni,etc). This phase provides an understanding of the professional world and the context in which the students are working, furthermore providing benchmarks for design quality and the contemporary design world. As a result of their research, students utilise playful research for design by experimenting with forms of white paper suitable for lighting construction, such as mounting board, printing paper and tracing paper, to create a unique table lamp. Providing students with similar, low cost materials identical in colour aims to encourage creativity and diversity in design amongst peers, deeming the project to be a process of problem solving and personal testing (Fig 2).

Through a series of successive models, students gain opportunities to build upon design aesthetics, function and construction with each prototype, the formation of each time improved designs playfully and quickly fill gaps between initial design ideas, working prototypes and final designs. Encouraged at all stages, research for design demonstrates student's understanding of the physical, functional and aesthetic relationship between materiality and the effects of light, as well as the spaces it occupies in terms of its scale and proportion.

In line with a playful approach to learning, physical model making allows students to think, learn and improve their individual designs and concepts through a trial and error approach. Rapid paper modeling is a convenient method of visualising the effects of light in terms of opacity, diffusion, reflection, glare, and effect upon a given material or space. Solimans, 2017 [9] study into appropriate teaching methodology saw CAD design deemed a suitable

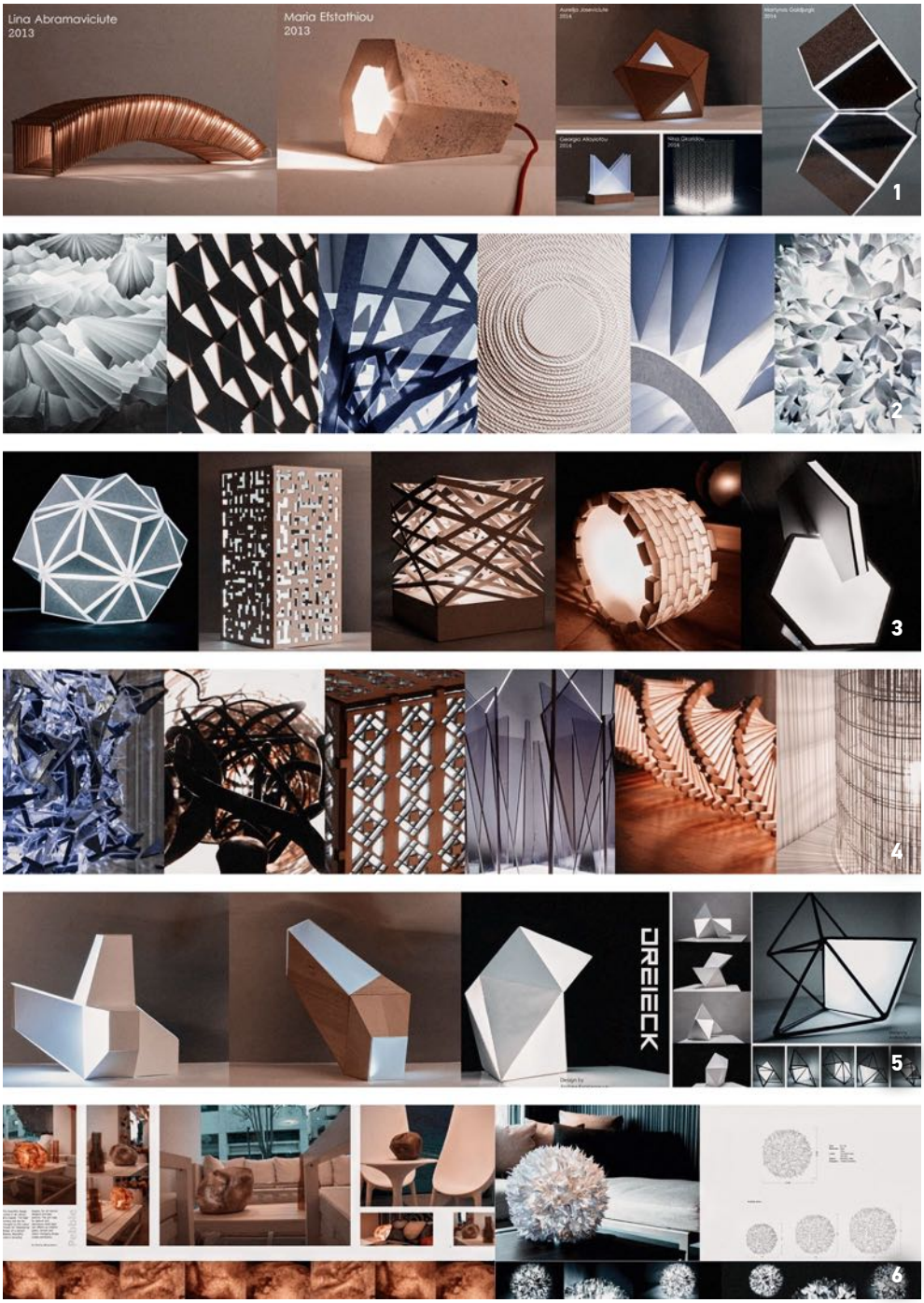

Fig.1: Final Lighting Prototypes
Fig 2: Paper Techniques
Fig. 3: Final Paper Lamp Prototypes
Fig. 4: Material Techniques
Fig. 5: Transforming Paper to Materials
Fig. 6: Lighting Design Leaflets

method of visualising design ideas among fellow educators, and the physical model as a mere final presentation technique, nevertheless upon lecturer student observation over the past decade, students who have attempted computer modeling pre-prototype development have not been able to succeed in understanding the physicality of materials in terms of their construction, textures, depths, tactility and most fundamentally, effects of light.

Students present their visual findings during allocated studio periods as well as within formal critiques, allowing physical models to act as a method of personal conclusions and decision making. The result of stage 1 is the presentation of a working prototype constructed through the use of paper to a high quality standard (Fig 3).

As a result of first stage investigations students are required to further examine lighting effects with various materials to develop and construct a second working prototype (Fig 4). Figure 5 demonstrates two examples of the development from paper modelling through to final material selection to a professional standard, expanding on the lighting fixture itself as well as understanding the notion of design collections within lighting fitting production.

In the final stages students are required to place their lamps within suitable and inspiring environments to document the lighting effects within contemporary interiors. The aim of this step is to practice and enhance photographic and presentation skills. Using skills gained through computer aided design students are required to create a presentation of a promotional leaflet (Fig 6).

3.3. Observations

Over the past decade of project observance it has been noted that students have an abundance of initial design ideas, but until visualised in an appropriate manner do not fully realise the consequences of their ideas. Through the physical documentation of light upon material, if the student or lecturer is not satisfied with the result, he or she may move quickly to the next prototype utilising diversity in materials, openings and effects. The project has resulted in numerous final prototypes to high quality professional standards. With a focus on exploration and playfulness once the language of design is understood, students can then continue to create a playful exchange between the worlds of 2d and 3d allowing them to 'play' with technology for a physical outcome.

'Light me up' provides students with an assignment where they are limited to both scale and materials, making the project a manageable size for first year education. Analysing the work displayed within this case study, students begin with little or no prior knowledge in the design field, when initiating students into the world of design it is important to provide a playful perspective to both learning and teaching, allowing students to have active roles in problem solving. As commented by Walsh [11] play permission has the ability to remove rules, providing freedom of creativity. Allowing the rules to come later facilitates the creative act during the period of concept development, thus supplying students with a creative environment. Once the concept is developed limitations of the final product must be implemented to produce a professional standard prototype.

4. Discussions

Implications of 'light me up' suggest that playful model making is a viable and continuing teaching method within early design education. The direct correlation of playful learning and the understanding of the world around is a key concept which may be successfully integrated into first year education. Already utilised as a technique in higher education from icebreakers, group builders, energisers, and get to know you exercises [15], play permission within the education environment has been shown to effectively encourage the learning and creative environment.

A playful design for research approach can be adapted to various levels of teaching as well as later professions. It has been further observed that 1:1 prototypes are the only way to truly understand lighting and its effect on a material, students who merely relied on sketches generally failed or were awarded a low grade. In some cases the choice of lamp at the last minute resulted in a bulb which was too strong or weak and in many examples students' lack of testing resulted in inappropriate colour temperatures being chosen. Furthermore, students who lacked the correct model making process encountered difficulties in construction, as well as being unaware of how to connect the technical elements required with the design object, moreover lacking understanding that it is vitally important to produce an object which works both with and without light. Conversely students who followed a design for research methodology of continuous model making were able to adapt their initial paper prototypes into varying materials to a professional standard, the completion of the project resulted in a pride in work and a satisfaction of their continuation.

Physical model making allows the visual to surpass the verbal, despite a time consuming process, a playful approach allows educators to integrate play back into everyday life. Additionally the playful approach to learning allows social interaction of peers during studio time providing a further enjoyment factor. It has been further observed that the playful approach sees increased enthusiasm and many students wish to supply a ta-da moment for generating surprising designs based on gut reactions [16] in terms of design and original context especially during the stage of paper experimentation. Overall upon receiving the project brief students see the paper trial as a straightforward task, while after much experimentation realise it is not as simple as first thought, largely most outcomes are high-quality in terms of light effect but many fail in construction of the object itself, a task which begins playfully turns challenging when function is considered, thus promoting the physical model as a tool for trial and error.

5. Conclusion

Models within design education communicate overall aesthetics but also reveal materials, textures, size, volumes, color, scale and layout. In the case of beginner students' their language for design is not sufficiently developed to communicate ideas clearly and precisely. In this scenario the approach to model making becomes a method of communication crucial to continued studies. Quick models are a valuable extension to the sketching process which

becomes part of a vocabulary for architects and interior designer. It is widely recognised that first year students have difficulties visualizing 3D forms which can be successfully understood through model making, along with form, model making provides an ability to understand function and design in space. It is also considered a continuous process to be repeated, edited and continued until the conclusion of a design, fundamentally the physical model allows us to "perceive the three dimensional experience rather than having to imagine it" [17].

Implications of the 'light me up' case study allow insight into playful methods of model making for first year design students, demonstrating the continuing role for the physical prototype within design visualisation, despite the increase in available technology. If completed successfully model making clearly communicates ideas and concepts to lecturers in order to develop and revise ideas. Learning through a model making process enables students to enhance interactions with their ideas, and to allow their concepts to be developed through a playful trial and error approach. As students explore the creative use of materials and light within space they are provided with developmental technique of practical skills from initial concepts to project presentation. Students are given permission to have an independent approach to learning, designing and problem solving. With a focus on exploration and playfulness this paper has summarised that once the language of design is understood, students can then continue to 'play' with the interconnection between the physical and technological three dimensional model.

As educators we must promote the 1:1 prototype to balance aesthetics and function. It is suggested that no matter how many 3D visualisations are produced you can never 100% understand the effects of light without the true physical entity and within the professional world of design we do not wish to mislead clients with 3D renderings which do not correspond to reality. Along with the fundamental principles of design, 1:1 prototypes build upon notions of context, space, place, site, understanding and designer to client communication. Once students recognise fundamental principles of physical model making, they gain sufficient knowledge to continue to the technological environment of recent decades. Overall this paper argues that without an early perceptive of hand crafted models the majority of students will not gain sufficient skills in understanding of space and 3D visualisation. Many believe that computer software is now readily available and we can forget processes of the past. In order to ustilise these technologies it is vital that students have prior knowledge and understanding of 3D space which is fundamentally gained through the physical model making process.

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Metamorphosis & Hybridity

Early Design Education: Collaborative Processes and Dynamic Learning

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Abstract

This paper examines the concept of dynamic learning models, focusing on aspects of collaboration and adaptability in early design education. At a time of rapid and unprecedented technological, social, and environmental change, (the wider context within which architecture operates), there seems to be a growing gap between the profession and the academic world. As the profession is becoming increasingly hyper-specialized, the academic environment, is consciously lowering disciplinary boundaries and attempting to create new synergies. As time and monetary pressures are placed on the educational system, there is a pressing demand to re-evaluate the type of knowledge that is addressed in architecture schools, and its continuing relevance to a wider context. Collaborative models and participatory processes, instigated by technologic advancement but also by a more socially inclusive model, are beginning to inform the design processes and organizational models. In contrast to the star architect system, they highlight the rupture between a solitary act of design and the emergence of a new learning and operative system. This research will discuss types of knowledge embedded in the design process, and examine an alternative learning framework, focused on developing dynamic and collaborative models as a learning environment for adaptability and change. The studio work and workshops presented, further develop the idea of a dynamic learning process through a shared language for investigation, communication, collaboration, and evaluation. The codification of information and relationships, within the process, introduces tools to understand and describe multiple, asynchronous, and dynamic relationships and spatial concepts. The ability to describe and control decisions, and comprehend their effects in multiple contexts, enables a new integrated approach to design, and creates conditions for agile thinking, and adaptability.

Keywords

dynamic learning / collaborative processes / adaptability / design pedagogy

1. Introduction

The last three decades, as architects, we have been experiencing a crisis. Never before had architects around the globe at their disposal such profusion of means to construct (material, financial and technological) and yet, we are faced with an irreversible crisis affecting the quality of the built environment and an "existential" crisis regarding the role of architecture and society. The profession has been characterized by the rise of the star architect and a disconnection to social and larger issues. At the same time, architecture education has been lagging behind in responding to the rapid changes taking place, and in an uneasy relationship with the profession and society as such. The need arises for a fundamental rethinking of the structure and operations of design teaching in overcoming the gap between the obsolescing institutions and a dynamic new world. The emerging pedagogic challenge is not to teach more subjects relevant to contemporary situations, but rather to introduce learning models which can integrate diverse and multi-layered processes, while at the same time place emphasis on developing tools for critical engagement and agile thinking.

2. Design Operations/ Dynamic learning

The first year of architectural education initiates the students into the design process through an immersion into tangible and intangible notions. Students are encouraged to develop personal perspectives in areas of interest, while at the same time establish a methodology and an understanding of the complexity of the design process and decision making taking place. Early design education is particularly critical in establishing a filter through which students begin to observe, understand, codify and react to the urban and social context within which they are called to design. This information is multilayered and now more than ever, rapidly changing or anticipating change. The need for a new vocabulary to describe these new and complex relationships arises early on, and with it, the need for a new way of learning. How do we discuss shapeless and nameless notions and how do we begin to develop on these ideas when they are yet to be described?

The most elementary conceptual lesson students learn at the early stages of the design education is that design is not an end product, but a multi-layered and complex system of operations and decisions. They learn that an architect can exercise a design decision through an operation or question, and that the results of such a decision are often complex and encompass many other decisions/questions. Architecture is thus defined as a practice-based discipline and the early studio education constitutes the students' first practice at such basic design operations. The ability to define and conduct such operations consciously also forms the first basis for communication between educators and students. Semantic precision, as Krippendorff [1] proposed, establishes the basic tools for the design process where naming, extending, conceptualizing, and linking, create a framework for discussion and feedback.

The studio environment introduces the students to the diversity of alternatives, the many and divergent approaches to the same question, emphasizing the need for a concise understanding and precision in design decisions and their consequences. A language or a

code to describe, organize, identify emergent patterns, and differences, is developed early on, to establish a reflective critical approach to the process. In 1987, in Educating the Reflective Practitioner, Donald Schön [2], discussed the notion of critical inquiry through the design studio. The design process, he argued, is seen as an opportunity for learning, when actions are taken not only to achieve an end product, but when through conflict or change, create opportunities to transform. Within this context, design cannot be seen as an autonomous act [3] but forms a conscious series of operations over time, engaging and addressing a complex system of dynamic relationships.

We define as a *dynamic learning methodology*, a non-linear learning model, which is both open and agile, a model of thinking that can address many asynchronous and changing parameters, a framework, which emphasizes potential and possibility. Early design education, calls for new thinking models, and tools for critical engagement, which can reintroduce discourse into the creative act. In a dynamic learning model, what design which is traditionally considered an introvert or internalized process, is challenged by a new cognitive model, a reiterative process informed by critical discussion and multiple frames of referencing. The notion of the 'solitary genius' is replaced by a contextual or relational landscape of knowledge, and a new model for communication and learning. The design process is re-defined through adaptive decision making, and what Rapoport [4] describes as a creative problem identification and reframing rather than actual problem solving.

3. Collaborative learning/ Communities of Inquiry

Matthew Lipman [5] popularized the term Community of Inquiry while rethinking educational practice from the perspective of a reflective paradigm. Creativity, according to Lipman, is not the result of a creative genius but is composed of a network of information, a rich way of thinking (or rethinking), identifying and revisiting problems. Collaborative learning, he argued, is socially situated and is thus enhanced by conflict and redefinition. The end product of a collaborative process, is composed of many possibilities, rather than frozen solutions.

The collaborative learning model was tested in our early design studios. Though the design process is not linear, the first steps of the methodology are structured and establish the ground work, upon which communication and design inquiry can take place. The first steps, concern the creation of a shared language, and a set of governing variables for an open operative framework. The exercises initially develop a spatial syntax and an understanding of basic design operations while at a later stage become increasingly more complex and open ended. Setting the framework as a set of basic rules for a process, means these rules can be broken or adapted only after (and if) they are clearly defined and understood. This creative deviation, creates a spatial framework to consciously ask questions and investigate options. The role of model making is central not only as a means of visualizing such operations, but also as an active learning dialogue for revealing embedded knowledge in what we call performative design process [6]. The model is seen as a malleable learning tool both mentally and physically. The designed "objects" are not autonomous, but contingent to many dynamic and diverse parameters. The collaborative learning model also removes

the hierarchic relationship between the students and the educator, and creates a learning model which places the educator in the role of a facilitator, while knowledge is created by the students through collective inquiry.

The collaborative design process is understood spatially and physically, but also as a mental organizational agility in terms of understanding dynamic notions. It enhances the ability to comprehend and handle complex models of thought and develops a new thinking model, which can accommodate new factors in the thought process, unforeseen parameters allowing for simultaneous time scales, synchronicities, and intensities. Students begin to think of ideas as scalable, multipliable, networked, adjustable and versatile.

4. Methodology/ Projects

The design methodology presented, focuses on the idea of the studio project as a dynamic process that encourages collaboration. It introduces the students to a process of codifying information, the creation of a spatial shared language, the notion of parameters and eventually tools to understand and develop dynamic relationships and spatial concepts. The process is defined as a set of guidelines that can be modified according to applied decision making, and comprises of several transitional stages that explore connection, discontinuity, repetition expansion and feedback.

The projects presented are from first and second semester of the first year studios at University of Frederick and University of Cyprus as well as a series of workshops which apply the processes and methodology in a collaborative environment.

The studios introduce the students to the idea of codifying information. Notions of parameters and open systems are introduced early on, creating a basis for spatial investigations using a generative spatial syntax. Through the development of modular exercises, the students are invited to investigate the concept of a module, which forms the basis for a generative set of spatial relations, with varying and differing spatial qualities. The design process, which is cellular and incremental, from the inside out, gives the student the opportunity to see and understand smaller spatial relations, and provides tools to repeat or modify accordingly. The assemblies are open systems which can expand in a lineal manner. This enables the students to combine analytic (rules based) and intuitive tools in designing environments.

The studio is broken down into a series of small exercises each building on the information gathered during the previous phase moving from general to specific. The process helps students transform initial reactions to the project into a structured methodology. The projects are divided into 3 themes: Folding, Mapping and Fabrication.

- **Folding** –a creative process in developing the notion of design operations, syntax and parameters
- **Mapping** –recognizing codifying and synthesising information in spatial relationships
- **Fabrication** – the process of actual construction in 1:1 scale in a real context (cultural performance)

Fig. 1: Folding exercises, Frederick University, Studio I

Fig. 2: Mapping the Body, Mapping an activity. Frederick University Studio I. A simple activity is documented using video, photography, drawing. The process becomes a vehicle for discussing spatial relationships and establishes spatial rules through observation and codification. The developed syntax is then used to design a simple pavilion/ apparatus to host new activities.

Fig. 3: Mapping Physical and experiential phenomena Frederick University Studio II. Site phenomena, are documented through a processual interpretation in time and space.

4.1. Folding

The exercise begins with a simple problem of transforming a 2-dimensional surface into a 3-dimensional system through a series of operations. Students are asked to explore the capabilities of each technique applied, and describe the technical and spatial qualities suggested by the proposed system. A continuous surface is transformed into a series of 3-dimensional modules. Each module can be seen as a complete singular entity as well as part of a larger system. (Fig.1)

By exploring the potential technical and spatial qualities of each process each project develops into a modular system with its own set of rules. Modules and open systems are adaptable by nature and offer opportunities for interpretation in multiple scales and contexts where a basic program is then applied.

4.2. Mapping (Fig. 2,3,4)

The second part of the studio exercises presented, is developed through a mapping process. Conventional perceptions of space and activity are challenged through a relational and processual way of observing and documenting. The mappings act as a narrative, a record of new realities, they make new connections and assign new meaning to existing information. Students are exposed to simple (or complex) phenomena and real life situations. Dynamic temporal and spatial conditions establish a creative discourse and a relational reframing of the situation. The projects do not offer fixed solutions, but rather "a spatial comment" on situations and have the potential to catalyse new programs, new experiences and a new spatial understanding.

The resulting projects address complex relationships and propose interventions that are beyond the expectations of a first year studio environment. We have also observed that the development and use of a syntax, early on, gives students, tools to begin to experiment with more complex notions and the first building blocks to address a design problem. First year students, have the mental capacity and fresh perspective to observe and identify extremely complex relationships, but are often missing the (spatial) words to describe, to change and to catalyse. In the early design studios, the spatial syntax, facilitates the creation of a dialogue, and the potential to see that which could not be seen in a traditional linear design process.

The space between (Fig. 5)

A project which actually takes place in the first semester of second year, in the University of Cyprus. It is presented here, as the further development of a dynamic collaborative learning model. In the presented projects, students, are faced with the challenge of simultaneously working on a shared plot, and to actively design the created in-between open spaces. The dynamic boundaries require the students to be conscious and in direct engagement in the definition of the shared space, and how it affects and can be affected by their intervention both on a small scale, but also on a neighbourhood scale. The resulting spaces possess properties of two (or more) actors, while relating to a wider urban context.

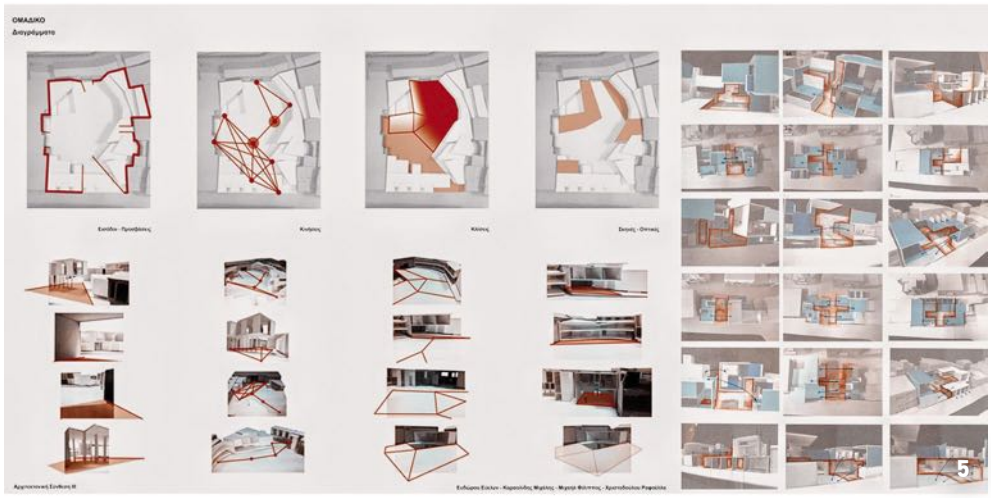

Fig. 4: University of Cyprus, Mediators Studio II, A pop up exhibition space. A buffer zone mediator. The students were invited to explore the potential of a simple mechanism which transforms space, eg. a hinge, a shading device. The recorded movements become the syntax with which students mediate space and program as a function of time, opportunity and changing needs.

Fig. 5: University of Cyprus, Spaces in Between Studio III

Fig. 6: Fabrication workshop in the Yard, Frederick University Studio II

4.3. Fabrication and Workshops (Fig. 6)

The introduction of workshops and 1:1 fabrication allows students to further develop ideas and concepts by introducing a new set of parameters: materiality, structural performance, fabrication, economy of means, time management and understanding human and technological limitations.

The students work on understanding the structural qualities of the material (in this case, cardboard). As the scale expands to 1:1, these issues become more pertinent and place emphasis on articulation, fabrication and durability. The cardboard structures take the student proposals out of the classroom and into the yard. They are no longer scaled models but full scale constructs that now have to perform, adjust to their site and hold the weight of their body.

Fabrication workshops (Fig. 7) are not designed for first year, but integrate similar processes and methodology in a more advanced and collaborative environment.

The workshops presented took place in small rural communities around Cyprus. They were realised in conjunction to local music festivals which presented the opportunity of engaging the designed structures with a wider audience. Each of the workshops was designed to focus on a particular aspect of the collaborative process: a. participation and collaboration, b. interaction and adaptability, c. activate underused sites through new programs and the last one, d. on the concept of the module and an open system of assembly and disassembly to host new uses according to reinterpretation and site conditions.

The workshops become the testing ground for the collaborative learning ideas and methodologies introduced in the first year studio while introducing the complexities of real situations, people, timeframes, budgetary concerns, fabrication restrictions, safety, aspects involved in the production of architecture.

5. Conclusions

Although these exercises have similarities to a digital way of thinking, the design tools developed, are not digital. They provide students, a new language to address topics of publicness, intimacy, transparency and enclosure. The projects develop from abstract unit foldings, to spatial organisations, dynamic systems, and from relational mappings of spatial notions, of bodies in space, of urban contexts, social constructs, to eventually one to one structures through a collaborative hands on learning process. Although they are examples of very early design education, they outline a a thought process and methodology which is valid throughout the educational and possibly professional path of students.

The presented work was the result of many students, and many collaborators which we would like to thank. It outlines a methodology developing since 2012. Having in mind the difficulty of early design studios they also frame the challenge and difficulty we as educators face in designing a studio, designing a methodology, but also establishing our own pedagogic questions within the framework and understanding the limits but also the endless possibilities and surprises we have seen from the students.

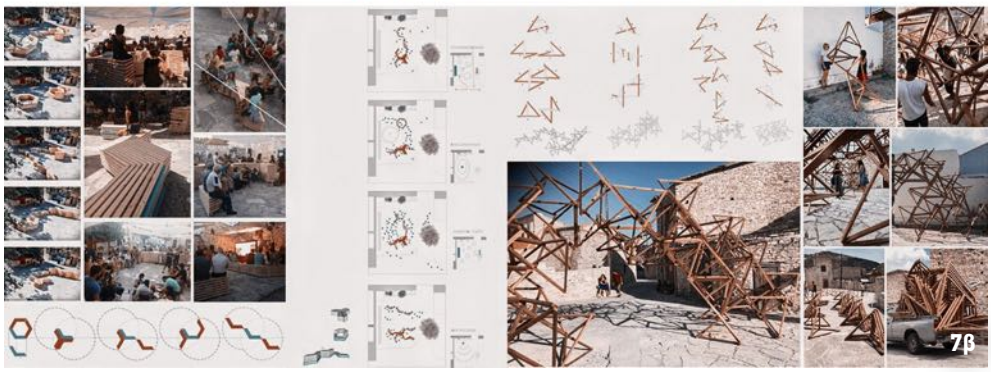

Fig. 7α, 7β: Kato Drys, Sindishies workshops IV, 2018

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Hybridity as Core Studio

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Abstract

At the culmination of the digital revolution, a period of crisis we are witnessing today, our agitation and discomfort with materiality, surface investigations, parametricism, digital fabrication, coding and its computational syntax are palpable. The architect's role and agency are placed back into central focus. A central theme in Antoine Picon's "The Project and Its Codification" is ascribing definition to architecture. Definitions that together form a summation of a fixed set of rules that a "projét" can be measured against. Picon then elucidates that the act of establishing such rules is perhaps the beginning of the end of those same rules given our proclivity for transgression and deviation, setting the stage for paradigm shifts and revolutions. "Much like science, architecture seems to function as a succession of traditions that become discontinuous during periods of crisis." As educators, our role is not to shy away from these questions but to perturb and agitate in order to instigate a new perspective. With that in mind, our experiment introducing "hybridity" to first-year students as a central theme that runs through the semester, is at once a challenge to a pedagogical norm (of progression from history of art and architecture leading into design studios), and a challenge to the typological preconceptions students come with. Introducing hybridity at an early stage sets a path into exploration, analysis and deeper understanding of the role of a "type" with its social, historical and political ramifications. Our paper presents the outcome of this studio with students' analysis of historic precedents, original transformational investigations and finally a programmatically hybrid space that repositions the user in a new light challenging the socially normative and historically accepted "type".

1. Introduction

Ingrained within architectural education and, by extension, practice today is a deep-seated belief in the hierarchical paradigm inherited from the Ecole des Beaux Arts (which itself adopted and modified it from the Guilds system): that *instruction* is paramount in the formation of the consummate architect. Such instruction would necessarily arise from the knowledge of the "Master": an erudite, distinctly superior figure with full comprehension of the subject matter setting the power dynamic. The conventional thought being, that through years of observation and repetition, one would acquire the Master's techniques and established solutions; and would therefore be able to take on repeating those same solutions. In essence, apprenticeship and instruction work in tandem in [trans]forming a student's skills in order to fit the mould of the Master.

Attempts to break from the Beaux Arts' paradigm and to invent new pedagogic approaches have varied in both their scope and levels of success. See for example the survey and analysis in *Radical Pedagogies;* a research project led by Beatriz Colomina with PhD students at Princeton University that looks at post World War II experiments in radical architectural discourse. [1]

"Architectural pedagogy has become stale. Schools spin old wheels as if something is happening but so little is going on. Students wait for a sense of activist engagement with a rapidly evolving world but graduate before it happens. The fact that they wait for instruction is already the problem. Teachers likewise worry too much about their place in the institutional hierarchies. Curricular structures have hardly changed in recent decades, despite the major transformations that have taken place with the growth of globalization, new technologies, and information culture. As schools appear to increasingly favour professionalization, they seem to drown in self-imposed bureaucratic oversight, suffocating any possibility for the emergence of experimental practices and failures." [2]

As the quote from Colomina states, we are faced today with new challenges in social constructs and with that, students demand innovative means of engagement with architecture and its pedagogy, challenging faculty into thinking ahead rather than simply delving into the past.

Nowhere does an attempt to break the normative "instructional" system of teaching come into conflict with the establishment more than in teaching first year students. As we consider curricula at a vast majority of schools of architecture, we note the one invariable sequence of coursework beginning with a serial compendium of the history of art and architecture that is, by and large, independent from the students' design studio classes. Those classes not only reify a predefined historical narrative but inculcate students on canonical solutions. It is important to note here the we acknowledge the importance of a well-rounded education that undoubtedly requires grounding the foundations of our contemporary context through an understanding of its historical development. What we are questioning though is the formulaic sequencing of this instruction. As such, our experiment does not propose to negate the crucial aspects of studying history, our approach instead attempts to propose design prompts while simultaneously introducing a broad swath of precedent in a deliberately non-linear model. The normative approach is therefore rearranged in order to prioritize "direction" rather than

"instruction" with emphasis on an immersive model enriching the students' visual acuity. Our approach takes queues from a collaborative discourse where a student's exploration is aided and directed by faculty and not superseded with predefined instruction.

Our proposition of utilizing a *hybrid* studio/introduction to history: combining design prompts with a nonlinear immersion of precedent also informs the subject matter of the studio. *Hybridity* permeates the course's intention with assignments starting with combining two seemingly disparate architectural objectives that bring into question the typological understanding of both.

2. Project sequence

2.1. First assignment

Without historical context for reference, students often bring their biases and preconceptions that are typically informed by their own experiences. A dwelling becomes limited to the houses they grew up in. To best contextualize and diversify their understanding of a dwelling typology, the studio begins with assigned case studies curated to illicit alternative examples to the traditional suburban single-family typology and introduces new notions of architectural and domestic form. Students are then encouraged to find evidence and examples where architectural properties and devices facilitate an alternative use of program outside strict familiar notions. While there are a number of invaluable case studies in the early 20th century, rich with lessons of modernity and materiality, they often render the architectural product one of wealth and privilege. A primary example was an analysis of the Todoroki Residence by Hiromi Fujii, a work/live project which uses the spatial and compositional technique of three-dimensional grids which sub-divides into a "*zero degree*" to produce a series of exterior and interior trans-scalar shells that nests spaces within spaces as a way to negotiation multiple scales of activity and privacy. [3] The student's principal extractions of this project were the architectural properties that manage tensions; and dialogs of economy, history and privilege as well as urban positioning. By studying ways architecture mediates these issues, students resolve a framework from which they derive options for addressing similar settings in their own projects.

2.2. Second assignment

Through the interrogation of their chosen case study in the first assignment, students are required to identify an architectural device in the form of an *action*. Students are then encouraged to study the formal transformations possible within the *action*'s multiple definitions. For instance, formal actions emerge from theorizing the verb *to divide* suggesting the action of separating an object into its constituent pieces or applying properties of disunity in the formation of space. This multifaceted understanding of each *action* then forms a generator for the second assignment as actions evolve into "formal operations" to process a series of architectural manipulations that start with three nonscalar cubes measured 6"x 6"x6" that act as tectonic sequencing of an intervention and artifact. These cubes must be of

different material types (mass, plane and stick). The sequential manipulations delimit cubes 1, 3 and 5, with further infill cubes (that can be of combinations of materials) developed to complete a logical sequencing of cubes 1 through 5. The infill cubes begin to introduce the concept of hybridity to the students at the material and architectonic level. Cubes 2 and 3 are questioned for the formal properties they inherent from the adjacent cubes; whether they merge, combine or produce new properties forcing students to rationalize the logic to transformation. Completing the sequence, the students are then tasked with designing a scaled, but not yet sited, *passage* and "threshold" informed by the spatial and tectonic formations derived from the cubes.

2.3. Third assignment

"American urban architecture has its foundations in the underlying gridded town plan and in the programmatic diversity of the Nineteenth Century city. A strategy for the revitalization of our cities must propose a building form compatible with the continuation of the orthogonal grid, and also be able to accommodate the city's diverse and seemingly incompatible activities. Hybrid buildings, inherently multi-functional and responsive to the constraints of the grid, can be offered as models for the stimulation and revitalization of American cities." [3]

The final project sited in an urban lot where a confluence of varied political, historic, social, typological as well as topographic conditions (on a hill overlooking World-War-II-era shipyards) introduces the students to the divergent forces that act upon a city, specifically San Francisco. With a fast-moving wave of gentrification having swept through this neighbourhood of traditionally blue-collar families, the more recent economic, social (and generational) pressures have forced new inhabitants into unconventional modalities. To simulate this predicament in San Francisco's housing crisis, the project prompt calls for two independent and unrelated, full time occupants with different occupations to live and work in the same space. The differences between the two occupants are leveraged to form parameters for contrasting workspaces, which may differ in various properties, or relationship to public. However, while the workspaces are seen as different, the living component of the house are required to have shared components; the level and degree of which is meant to challenge students to propose new living arrangements and programs that may vary traditional plans and sections. Students are required to use the architectural devices and properties developed in the previous projects as tools to resolve new typologies and therefore complete a thread of investigation. In addition, students are encouraged to develop the fictitious occupants' unique personalities, and different balances between work and life as they begin completing the programmatic requirements of each pair all the while maintaining the tectonic language they have developed in their previous assignments. The hybrid nature of the neighbourhood then infiltrates into the domestic and mercantile spaces as well as navigating the requirements of each of the pair's personalities.

The outcome of the students' work can then be placed under one of two categories as outlined in Pamphlet Architecture No.11 Hybrid Buildings:

"...two basic categories of program are readily identifiable: the thematic program, and the disparate program. Both are based on the combination and interaction of the programmatic

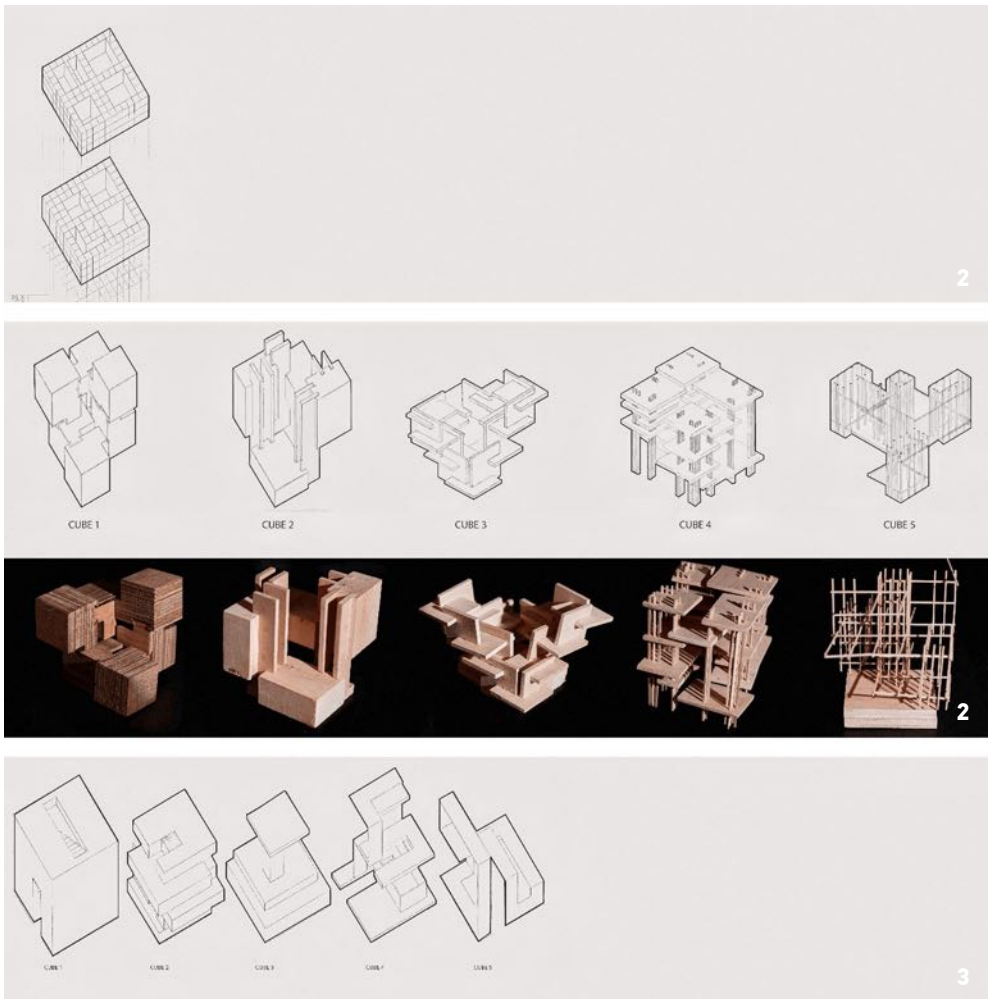

Fig. 1: Todoroki residence analysis, by Edgar Castillo. This axonometric diagram uses the subdivision as an architectural device to further the suggested spatial orders embedded within the interior / exterior trans-scalar shells.

Fig. 2: Cube transformations, axonometric drawings and study models by Ernesto Casillas, based the structural principal of "interlocking" which when aggregated explored the formal and spatial properties of "precarity".

Fig. 3: Axonometric drawings of a cube transformations study by Lowai Ghaly, which studied the distribution of mass and void to create "contrast".

parts. Thematic combinations cultivate the dependency between parts and encourage the interaction of elements. Disparate combinations allow pieces to exist in a mutual, almost schizophrenic aspect of society and of the period. " [4]

Several of the students' final projects embody the former, *thematic*, combination where one can clearly trace the logical additive process of one typology onto the other. See for example Figure 6, the clear distinction between the materiality and spatial dependency of the apothecary (plexi form) on the grounded and solid dwelling where hydroponic gardening is to take place. In other words, this example embodies the "graft hybrid" model.[5] In a similar vain, Figure 7 shows the outcome of combining a vertical core where the production of kombucha grounds the "lifestyle concept store" that revolves around it. In this case, the outer skin constitutes the "fabric hybrid" model, encompassing both activities.

In contra-distinction to the two aforementioned examples where form is clearly evolved, another group of students attempt at diluting two incongruent typologies often arrive at outcomes that struggle with form-making, yet were exemplary in their evocative breakdown of their constituent typologies. See for example Figure 8, where the student's Jekyll-and-Hyde inhabitants form two opposing nodes. On the one hand, the introverted taxidermist longs for privacy and quiet, whereas on the other hand, the cohabitant extroverted showman demands constant attention and visitor-flow to maintain their burgeoning business of modern-day hybridized oddities ala Ripley's Believe It or Not museums. The theatricality of the form belies the secrete rooms and parallel corridors; and exemplifies the "monolith hybrid."

By reflecting the final project's site, program and occupancy on the San Francisco housing crisis, the studio asks students to begin addressing real issues early on in their careers as designers to instill a sense of empathy in the design process. While the first half of the studio focuses on abstract architectural-centric studies of precedent and formal cube-transformations, the subject in the final project shifts to consider real issues in contextual format in our locale. *Hybridity* is introduced to students as a methodology to detach from established architectural applications and offer new ways architecture can be responsive to changing populations and ways of living.

3. Conclusion

"The hybrid building is a self-homage to the architect's individual creation. Each hybrid is a unique creation, with no previous model. The actual building comes from an innovative idea, which is resolved against the established combination of run-of-the-mill programmes and bases its raison d'etre on the novelty of the approach and the mixture of unexpected functions." [6]

At the culmination of the digital revolution, a period we are witnessing today, our agitation and discomfort with materiality and surface investigations, parametricism, digital fabrication, coding and its computational syntax are palpable; and the architect's role and agency are placed back into focus. As educators, our position is not to shy away from these questions

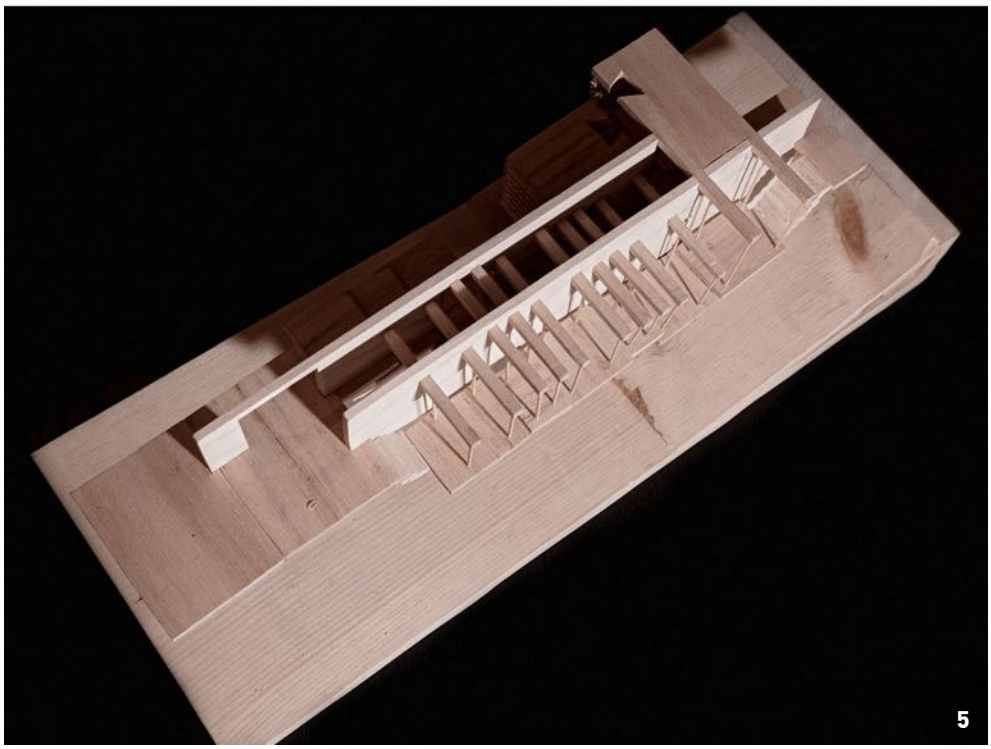

Fig. 4: Passage model by Lowai Ghaly uses carved walnut blocks to expand on a formal relationship of masses and voids by nesting the circulation between spaces in the voids so the spatial experience of contrast is experienced as a threshold.

Fig. 5: Passage model, by Ernesto Casillas, derives form from a series of interdependent structural joints meant to visually compromise any dominant mass suggesting a precarious experience.

but to perturb and agitate in order to instigate a new perspective. With that in mind, our experiment into introducing "hybridity" to first-year students as a central theme that runs through the semester, is at once a challenge to a pedagogical norm (of progression from history of art and architecture leading into design studios), as well as a challenge to the typological preconceptions students may have come with. Introducing hybridity at an early stage sets them onto a path of exploration, analysis and deeper understanding of the role of a "type" with its social, historical and political consequence. This methodology uncovers new subjects and settings for students to respond to; rather than designing for other architects, students are instead asked to consider real-world conditions. In this process, a critical outcome for a successful project is dependent on the students' ability to develop and apply a sense of empathy to their propositions.

A central theme in Antoine Picon's "The Project and Its Codification" is ascribing definition to architecture. Definitions that together form a summation of set rules that a "projét" can be measured against. Picon then elucidates that the act of establishing such rules is perhaps the beginning of the end of those same rules given our proclivity for transgression and deviation, setting the stage for paradigm shifts and revolutions. "Much like science, architecture seems to function as a succession of traditions that become discontinuous during periods of crisis."[7]

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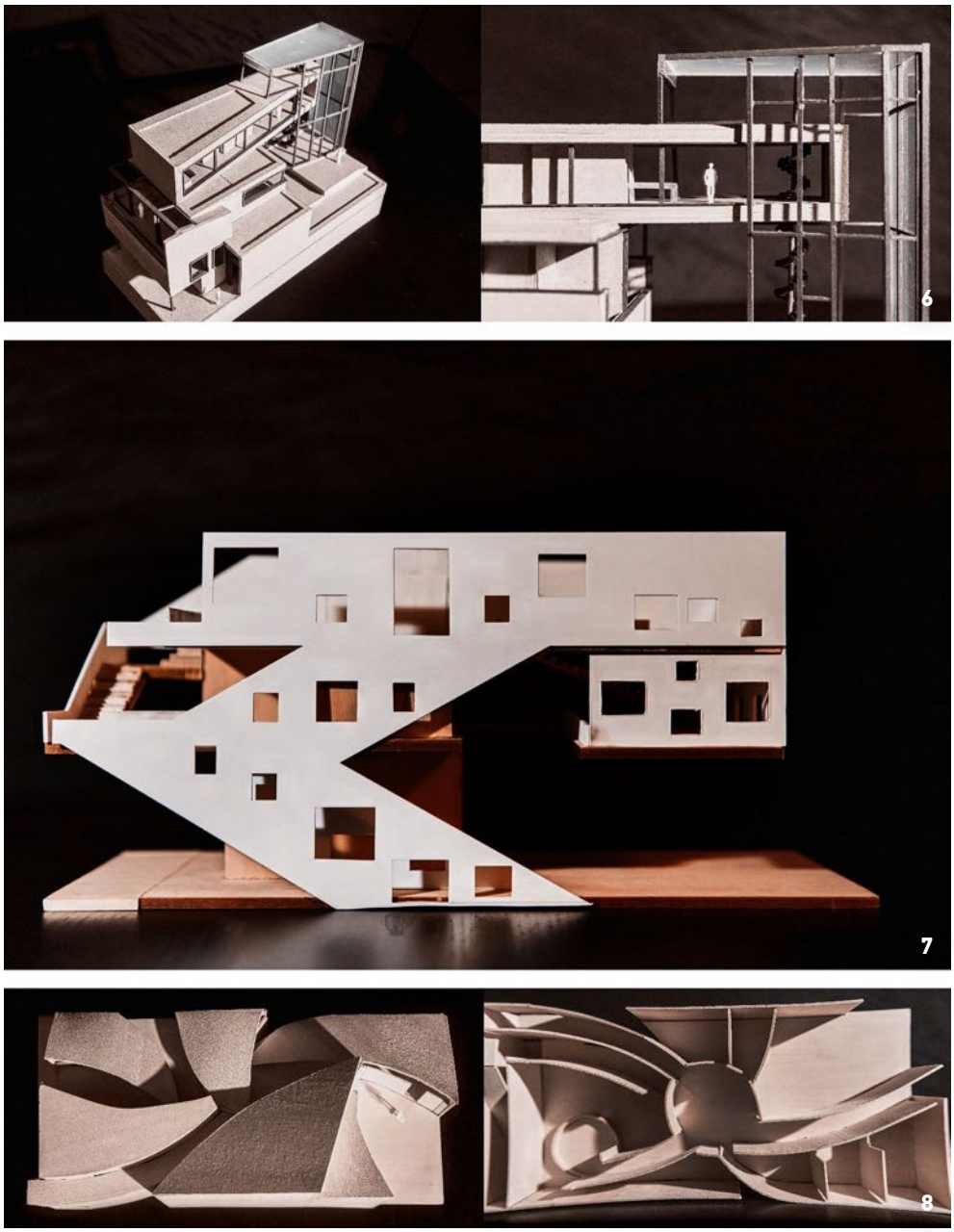

Fig. 6: Hydroponic gardening and apothecary, plexi-glass and chipboard model – Andrew Hart

Fig. 7: Kombucha production and lifestyle concept store, museum board and wood model – Diowo Jossart Lushikwa

Fig. 8: Introverted taxidermist & showman, balsawood model – Edgar Castillo

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From the "Escape Place" to the "Hybrid City": Introducing Beginners into Architectural Design

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Abstract

The aim of the paper is to present the teaching methods and approaches adopted in the introductory architectural design studio of the first semester in the School of Architecture at Aristotle University of Thessaloniki. Students are gradually introduced to the nature, role and context of architecture through a sequence of five individual and five group exercises / projects that focus on: a) the different scales of space in relation to the human body, b) the use of various representation means, tools and techniques during analysis, intuitive experimentation, design process and critical presentation, c) the systematic study –through drawings, models and diagrams– of architectural references and precedents, which initiate fundamental principles and abstract thought, d) the formation of concept and synthetic logic, attempting to respond to each problem that rises from the different facts with a unified, creative and coherent way of thinking, e) the notion of context and complexity of the city, as well as the relation of each architectural project to the urban fabric. The sequence of the exercises carried out initiates from the mental mapping of an 'escape place', moving on to the design and construction of a 'hat', a 'chair', a selected 'precedent', an 'inhabitable space', to finally conclude to the formation of a 'hybrid city'. This foundation studio includes an extended number of lectures preceding each exercise. Design process and experimentation –from concept to final crit– makes use of multiple synthetic tools, with an emphasis on physical modelling. The paper will critically discuss the above issues, aiming to uncover new ways of discovering, understanding and creating at the beginning of architectural education.

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1. Introduction

Architecture is perceived and understood by each one of us in a different way. From the early young ages, we experience architecture without thinking about it. We could argue that there are as many definitions for architecture as there are architects. Architecture is a hybrid discipline. It has the characteristics of a science that interprets art. The architect, as a scientist and a theoretician, seeks to define relations of spatial elements and materials, with which, as an artist, will compose to fulfil a human need.

Students are confronted from the very beginning with a multidimensional practice and a complex science. Unlike other sciences which are found in a state of 'normality' [1], architecture is not entirely defined and does not have an acclaimed paradigm to follow. The understanding and practicing of architecture are a constant investigation, which is initiated during the first year of study, especially in the architectural design studio, and never actually ends.

In fact, fresh year students are exposed to architectural teaching for the first time, whereas music, painting, philosophy, math, information technology etc. are all subjects to which they have already been introduced during their school years. This makes teaching architecture at the very beginning of one's education a great challenge.

The complexity and vagueness of architecture allows multiple teaching interpretations and approaches. In the evolution of architectural teaching, various phases are detected, which prioritized certain values and were characterized respectively by the aesthetic, technological, scientific and social approaches. At the same time, one may distinguish three important hermeneutic attempts, which claim an identity of architectural theory, such as the analytic (syntactic), semiotic and phenomenological approaches, with their variations and supporters.

These approaches talk about deep [2] or more complex structures and the different aspects from which one can read, design and teach the architectural phenomenon. These aspects constitute different readings of one single unified thing.

During the last years, rapid changes have been made to the essence of civilization and society, with the development of new technologies in communication, information and exchange being the most important. We have witnessed the coexistence of a conceptual minimalism and an expressive approach which is inspired by nature, biology, mathematics and seeks analogies from non-architectural objects, both in matters of organization, structure, process and correlations and the questions of materiality and form.

Nowadays, architecture, its teaching and the role of the architect are undergoing a phase of new awareness. The architectural work is re-conceived as a whole, which is in dialogue with both its content and context. The different approaches mentioned earlier are combined into a comprehensive approach, in which the exploration on the environment, the technology and the living conditions of people are fully integrated.

According to Chomsky [3], since Renaissance, the aim of education has been to teach students determine how to learn on their own. This comes entirely at odds with the perception of

manipulation, during which students function in a framework where they follow instructions or recipes.

It's in fact this teaching method that we adopt in the introductory architectural design studio of the first semester in the School of Architecture at Aristotle University of Thessaloniki. We urge our students to observe, to take 'notes' on their sketchbooks, to look for new experiences, to experiment, to transform difficulties and problems into creation opportunities and hybrid situations, to take risks and overturn things one may consider absolutely right, to discover their own truths.

2. Structure and content of the design studio

The introductory architectural design studio aims to initiate fresh students in: the understanding and research on architectural design; the development of creativity; the contact and experimentation with various means and techniques of expression and representation, giving though emphasis on artefacts and models; the familiarization with the various scales of space through the formulation and presentation of different scale projects; the introduction to the organization of the built environment and the form and structure of urban space.

Through a sequence of exercises, the course discusses issues such as thinking and practicing within the built environment, abstraction and materiality, concept and construction, systematic design process and free experimentation, transformation and hybridity.

The studio takes place in the first semester (13 weeks plus a supplementary one), twice a week, consisting of 7-hours studio work on the first day and 3-hours sketch practicing on the second. The large number of students (~ 180) requires a clear structure of the studio, the involvement of at least 5 teachers and the division into two units. The pedagogical approach we adopt in our unit, which is reflected on the structure of the studio, includes (see Table 1):

- Lectures and/or short films followed by comments and discussion
- Individual and group studio work
- Additional individual work at home
- Presentation crits
- Keeping a daily sketchbook and preparing a portfolio

During the semester, students work on 5 individual and 5 group exercises. By the end of each individual exercise, they present their work. Throughout the crits, we encourage the students to participate in the critique and comment both on their own work and the work of their fellow students. For each exercise, students are also asked to give a title to their work and compose a brief explaining their main concept and rationale. The artefacts or models produced within each individual exercise are used in a group exercise which takes place in the class, with the aim to understand the dynamic of transformation process and explore hybrid situations by putting together, juxtaposing, superimposing, and recomposing in order to fabricate something new.

Duration of the course	13 + 1 weeks
Duration of the studio	10 hours/week = 7 h studio work + 3 h sketch practicing
Number of students	170-180
Number of professors	4-6
Structure of the studio / pedagogical approach	Lectures and/or short films + discussion + individual and group studio work + additional individual work at home + presentation crits + keeping a daily sketchbook and preparing a portfolio
Number and type of exercises	5 individual + 5 group
Number of presentation crits	5

Table 1: Profile of the introductory architectural design studio.

The students are also asked to keep a daily sketchbook containing their sketches, notes, reflections and recordings of images, impressions and other sources of inspiration, as well as to prepare –at the end of the semester– a portfolio (in A3 size) of what they have produced during the elaboration of the exercises. The assessment of their performance is based on the evaluation of these two deliverables.

The sequence, the title and type, the content, the representation means, tools and techniques as well as the main objectives of the five individual and five group exercises are presented in Table 2.

No	Title	Type	Content	Representation means/tools/techniques	Objectives
1	MY ESCAPE PLACE...	individual	Creation of a postcard/mental map (A3) representing a real or imaginary 'escape place'	Mixed technique/collage	Familiarization with the notions of place, site, locus, landscape, u-topia, eu-topia, dys-topia Understanding the concept of a mental map
2	EU-TOPIA / U-TOPIA	group	Composition/re-composition of real and imaginary places		Getting to know each other Comparisons and grouping
3	HIS/HER HAT...	individual	Making a hat for a hero/heroine from a movie/play/book by using a white cardboard (A2)	Sketches Exploded view Drawings (plans, facades, sections) in scale 1:5 Artefact in scale 1:1 Photos	Converting a 2D surface to a 3D object Transformation of a simple/common material and study of its potential Understanding the scale of the human body
4	TRADING ROLES	group	Hat catwalk	Photo shooting	Combinations and exchanges of scenarios and roles

No	Title	Type	Content	Representation means/tools/techniques	Objectives
5	HOW TO MAKE A CHAIR	individual	Design of a seat/furniture made by recycled materials	Sketches Drawings (plans, facades, sections) in scale 1:10/1:20 Mock up model in scale 1:5/1:10 Model in scale 1:1 Photos	From concept to fabrication Issues of ergonomics Introduction to materiality issues and construction techniques Understanding construction details Initiation in the main design styles
6	SITTING TOGETHER...	group	Seat trial; furniture combinations and compositions		Comparisons and grouping Creation of spaces of social gathering
7	ANALYSIS OF AN ARCHITECTURAL PROJECT	individual	Analysis of precedents; selection from a list of given architects	Diagrams Drawings (plans, facades, sections) in scale 1:50 Model in scale 1:50 Photos	Analysis of the synthetic principles and structure, horizontally and vertically, of a residential building Initiation to fundamental notions/dipoles such as: symmetry/asymmetry, balance/order/harmony, continuity/flow/unity, hierarchy/emphasis, contradiction/counterpoint, grid/frame, analogy/repetition/rhythm Exploring the relationship between architecture and human needs and actions
8	HYBRID SPACES	group	Composition/re-composition of all models; creation of hybrid spatial structures		Understanding the dynamic of transformation process Exploring hybrid situations Juxtaposing/superimposing/recomposing
9	INHABITABLE SPACE	individual	Design of a small-scale house (25-30 sqm) including an area for food preparation, a living and sleeping area and a sanitary room, based on a scenario for the user/users	Sketches Drawings (plans, facades, sections) in scale 1:20 Working models in scale 1:50 Model in scale 1:20 Photos	Introduction to the basic characteristics of a dwelling space Using references and precedents to initiate ideas Exploring the relationship between the concept and its implementation Production of meaning through design Producing space to embrace human actions and fulfil specific needs Exploring the structure, the boundary and its perforation, the relationship with the ground
10	HYBRID CITY	group	Composition/re-composition of all models; creation of a part of a city	Drawing (masterplan) in scale 1:200 Photos	Exploring the relationship between architecture and its context Initiation in urban morphology and fundamental approaches of urban analysis Understanding the basic components of urban tissue and the fundamental factors of its formation/transformation Understanding topography and the special features –natural and artificial– of a landscape Familiarization with larger scales of design and planning

Table 2: Profile of the exercises.

3. Aims and results

As students are gradually introduced to the nature, role and context of architecture, through the sequence of the aforementioned exercises, the design studio focuses on the following five themes:

a) The different scales of space in relation to the human body

From Vitruvius in the Antiquity to Leon Battista Alberti and Leonardo da Vinci in Renaissance and the 20th century Le Corbusier's Modulor, Neufert's ergonomics or the embodied experience in the *phenomenological approach* to *architecture* [4], exploring the relations, correspondences and interactions between human body and the built environment has constituted an enduring fundamental in architecture.

Starting from one's 'escape place' and the way he/she experiences himself/herself in it, and passing successively to making an object that can be worn, constructing an object that can 'receive' the human body, creating spaces of human gathering, investigating the 'body' of a residential building and the way it 'hosts' the human body, as well as the ways it could do so by transforming it, producing a residential space that embraces specific human actions and needs, to finally creating a part of an urban space –the space *par excellence* of human socializing, students get familiar -step by step- with the different scales of the built environment in relation to the human body.

They also get to know human body analogies, the meaning of fundamental principles such as symmetry, harmony, rhythm and the system of proportions that predominated for centuries architectural thinking [5]. Moreover, they are confronted not only with the importance of dimensions, metrics and ergonomics in architecture, based on a conception of the 'normal body', but also with the variations among different/other human bodies –by making comparisons or 'trading roles'– and the multiple forms of embodiment not always taken into consideration in architects' design conceptions [6].

b) The use of various representation means, tools and techniques

The tools in the hands of a student which is learning to communicate the language of design are many: sketches, collage, diagrams, plan and section drawings, images, models.

Our aim is for the students to understand which are the appropriate means to reach the solution that has already been vaguely shaped in their minds. These representation means that could bridge an abstract thought with its solid application include both traditional and digital tools. However, in this introductory design studio, the emphasis is mostly given on the use of hand and the production of artefacts.

One of the most important and fundamental tools from the beginning of the studies are the models with experimental and research character. The model attributes the basic structure and the perception of space, interprets and classifies geometry shapes and volumes, comments on notions such as gravity, scale, continuity, form, solid and void, light and shadow, relationship with the ground. It raises the issue of boundaries, openings and connections. Moreover, students working on models of different scales come in contact

with various expressive and representation techniques, starting from the analysis of the site and the program to intuitive experimentation, formation of the concept, design process, elaboration of the project until its final critical presentation.

In recent years, however, new strategies are being gradually adopted in the teaching of architecture and several are being used even from the very beginning. Available software programs and manufacturing technologies are constantly increasing, underpinning the complementarity between idea and construction. The concept of mapping the natural and anthropogenic landscape is used, investigating simultaneously the total of criteria that alter it [socioeconomic, perceptual and ecological]. The environmental dimension in design is redefined, as the environment from inactive, static content, which surrounds the architectural object, is transformed into a dynamic design object. Last, but not least, the model itself is redefined, from an abstract representation of space under scale to a 1:1 prototype model and test medium.

c) The systematic study –through diagrams, drawings and models– of architectural references and precedents

Before the students proceed to an advanced grade of complexity in design, we urge them to study precedents in architecture.

Based on the works of Clark & Pause [7] and the ideas of Ching as well [8], we introduce fundamental principles, abstract thought and the use of diagrams. This systematic study of global precedents and individual solutions is extremely useful, since it initiates a series of questions on architecture, in an attempt to outline the spirit of each era and the multiplicity of the architectural phenomenon. It includes all the basic themes, starting from the search for meaning through the structure and the associations [9], the investigation of the boundary and its perforation, the relationship with the ground and the issue of the section, the spatial finds, the surplus.

The students witness, study and reproduce what the architect does, how he/she does it, how he/she projects what he/she does, what associations and experiences he/she trigger. Thus, they begin to understand that the architect moves through a grid of decisions (aesthetic, functional, techno-economic, symbolic etc.). He/she draws his/her inspiration and optimizes the relationship between these decisions, so that he/she neither lag behind nor exaggerate in one of them according to the given situation.

d) The formation of the concept and the synthetic logic

One of the most interesting things in architecture is probably the discovery of new ideas and worlds. Ideas have power. However, every choice involves the resignation from some other ideas and this resignation often requires moments of great clarity. And that's where the teacher plays a decisive role. He/she urges the students to take risks and experiment with less worry about rejection, to listen to their instincts without losing the purity of their thought, to filter past information and broaden the understanding of things in their own way.

Architecture is conception, it is planned and projected thought; thought that stems from knowledge, history and experience, but also thought triggered by unexpected events,

images, sounds and words, which are often recorded subconsciously and recalled in unexpected moments. Architecture is generated by an idea and ends in its implementation through a total synthetic procedure.

The architect usually composes for people, in a specific context, for a specific use, in a specific time, attempting to respond to each problem that rises from the different facts with a unified, creative and coherent way of thinking. Its narration initiates by acknowledging the structure of the place, understanding and experiencing its uniqueness. Place, program and people are intertwined and interpreted in an open field of experimentation, producing spaces and landscapes dynamic, osmotic, hybrid and at the same time familiar, sustainable, functional and adaptable to the conditions of time.

Architecture, more than any other art form, relates to living space. It is an art that contains life [10]. One of the basic roles of architecture is to make people feel nice in the places they live, go to school, work or socialize. In the studio students are reminded of this role. They recall memories and experiences. They experiment, flirt, think, recompose, make use of their own tools, so that their associations become reality. And throughout this journey of exploring and developing ideas, they seek meaning; they search for that main idea which will be expressed with clarity on every dimension of their project and render meaning to their synthesis.

Understanding the issues and directions that the proposal can take and formulating the right questions are main points in teaching architecture. During the presentation crit of each exercise, we try to rationalize and analyse each gesture, so that the students realize the importance of their synthetic decisions and may be driven beyond the boundaries.

e) The notion of context and complexity of the city, as well as the relation of each architectural project to the urban fabric

From the very beginning, we give particular attention upon introducing students to basic notions such as place, site, locus, landscape, as well as understanding context and the different meanings it may take in architectural usage according to Johnson [11] –i.e. varying from the built fabric, the ground or the environment in which the architect works taking into consideration culture, history and other aspects.

As cities, "among the most enduring and remarkable of all human artefacts" according to Kostof [12], constitute the main receptor of the architectural object, we initiate students to the comprehension of the urban morphology, the form and structure of urban space, the basic components of urban tissue and the fundamental factors of its formation/transformation, by introducing them to basic perceptual [13, 14, 15], historical and typo-morphological [17, 18, 19] or structural [20] approaches of urban analysis and design. Especially the last two group exercises –i.e. hybrid spaces, hybrid city– aim at understanding the dynamic of transformation process and exploring hybrid situations, such as the 'Collage city' [21], at understanding topography and the special features –natural and artificial– of a landscape, and thus getting familiar with larger scales of design and planning.

While exploring the relationship between architecture and its context, we also urge the students to think about contemporary environmental conditions and problems to gain

Fig. 1: Snapshots of the exercises: (a) my escape place; (b) eu-topia / u-topia; (c) his/her hat; (d) trading roles; (e) how to make a seat; (f) sitting together; (g) analysis of an architectural project; (h) hybrid spaces; (i) inhabitable space; (j) hybrid city.

ecological awareness and embrace ecological dimensions of design in their projects –from the use of recycled materials to considering climate and orientation factors, as well as basic environmental design principles and techniques.

4. Conclusions

The extensive discussions in the first-year studio aim at the development of the students' critical thinking. Expressive abundance, manifold look, contradiction, in the final crit, are all considered necessary at this very beginning of architectural education and are revealed in the plurality of different solutions in the projects and the breadth of approaches and original ideas.

The architecture student is called to play a new role in a radically expanding practice and represent a generation, whose productive work touches many specialties, so that the boundaries of livelihood, creativity and art are dissolving and unclear. Having gone through the so-called post-digital era, in which digital tools have been fully integrated not only in everyday life but in the architectural teaching and practice, we perceive, experience and design architecture with new different ways, with new technologies and hybrid materials that acquire new qualities. The architect's profession is changing. It acquires even more dimensions and greater flexibility for multiple collaborations.

However, for students to be agile and open in this field of possibilities that architecture consists of, we believe that the role of architectural education is mainly to cultivate the ability to seek the essential, to gain awareness of meaning, to associate things seemingly unconnected by transforming them and creating hybrid situations. Thus, teachers should push their students to the gradual development of their own skills, the managing of their inspiration and experience and –ultimately– the shaping of a coherent design self-consciousness, sensitivity, discipline and clarity.

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Body & Otherness

Differently Abled Bodies: Architecture, the Senses, and the Body Political

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Abstract

This paper addresses the fundamental role that the human body has as a starting point in architectural design. It will show the work developed in Design Studio 2: Form and Material (DS2), which is the second semester Design Studio for first year students at IE University (Segovia and Madrid, Spain). IE University is a multicultural institution that receives students from every continent and uses English as the shared language of communication. DS2 is a foundational course and introduces the broad range of scales that architects confront in their work. It starts with the immediate and intimate scale of the individual human body and through a phenomenologically engaged process opens its scope to reach the social and political scale of the city. The semester is divided into four assignments, all under the conceptual umbrella of: the 'differently abled body'. This frame forces the students to start their exploration of architecture taking into consideration both the physical and the socio-political constitution of human bodies. The first stage of the process is focused on the senses, exploring the physical and psycho-physiological capacities of individual bodies to engage with space through the material construction of a human-scaled artifact. The second stage goes one step further and proposes architecture as the artifact that helps the body to interact with both material space and its social construction; user and program are now the key elements. The third stage introduces the site; extensive mapping helps the students to engage with the complexity of a given space in the city of Madrid. The final stage asks them to put the previous concepts together, and proposes a small scale intervention into an existing building within the mapped area. The result highlights a space designed for both a specific user and the inclusive political subject of the community.

1. Introduction

This paper will present the work and the pedagogical background that gives content to the first year second semester Design studio course at IE School of Architecture and Design. IE School of Architecture and Design is part of IE University, a truly multicultural institution based in Spain, with campuses in the cities of Segovia and Madrid. This means, in the case of the class we will discuss, that the 28 students that made up our group came from as many as 20 nationalities, from four continents[1]. When working within this environment of a very complex set of individuals with very different cultural backgrounds, important pedagogical demands and specific organizational criteria are necessary. Most importantly, we tried to prevent the urge to homogenize these individualities, not so much with the goal of increasing inclusivity, though this was an added benefit, but more so to begin a conversation about designing for the needs of the specific individual rather than the general population. Trying to establish the parameters of such a discussion within an established and fixed IE model of architectural design, or any other historical or regional precedent, of which students must learn to conform to and operate within, is an approach that was discarded from the beginning. On the contrary, we believe that the main asset of the School is precisely the diversity of backgrounds and cultural traditions of the students, so one of our objectives should be to emphasize that diversity. However, the discussion also needs to start from shared common experiences, which can be understood by all the students regardless of their individual backgrounds, and that permits beginning a conversation on space and its architectural production beyond cultural convention and existing paradigms. A common ground that, in a way, would be pre-cultural, even if it is later modelled and nuanced by culture, and could, in that sense, be considered pre-linguistic.

We find this common ground, as many before us, in the body itself, and although human bodies are indeed a cultural product when perceived abstractly as objects, our individual bodies somehow exist in the liminal state between the unique and the universal. By emphasizing the individual body we ask the students to bracket the cultural conventions of the universal, Vitruvian, form and take a nominalist approach to their own bodies, emphasizing how the feeling of being a unique body is ironically what we have most in common with other bodies. While conversely, the idea of an ideal, or universal human form is what alienates us from each other when we perceive ourselves as variations on that ideal. The first architectural act, then, after students recognize the(ir) body as the center of their own connection with the world, first in a purely physical way, then in a more complex and multi-layered way, is to start a survey of the different sensations and perceptions from which the experience of the world is produced, through which an embodied space is eventually given birth. At this point it is necessary to begin to create a shared vocabulary based in the senses, which would allow the students to begin dealing with space and with the spatial implications of humans living within the larger built environment (the human production).To do this a closer inspection of the different senses is demanded, and especially of how they work in connection with our

[1] Egypt, Turkey, Russia, Italy, Spain, Austria, Brazil, Denmark, Belgium, Croatia, South Africa, Venezuela, Colombia, Lebanon, Jordan, Morocco, Mexico, Ecuador, Peru, Panama.

understanding of abstracted space. The strategy for doing this is one of negative reduction, or a paradoxical understanding: what happens if a body has one of the senses radically altered, either because it has been hindered to the point of non-existence or hypertrophied to the point of erasing (the) others? The idea of the 'differently abled' body now enters into our shared conversation , so that by way of reducing in scope, but gaining in intensity, the investigation the students are required to do on the multiplicity of senses becomes more insightful. It is after emphasizing the senses in this way that by reintroducing culture, in terms of the socio-spatial politics of the body, a new discussion on architecture and space definitively begins, which will travel from the intimate space of the embodied self, to the collective and the community produced space of the city, hence traversing from the micro through the macro scales of architectural design and production.

2. The normal, abled body

What is an abled body? How many different forms of being abled exist? How do bodies relate to spaces? How does architecture shape these spaces and vice versa and how might it conform to or work against these bodies?

Tentative answers to these only apparently simple questions trigger a subset of other questions that will lead the students to a more general inquiry into the meaning of such terms as 'body', 'senses', 'space' and, of course, 'architecture'.

It can be said that human bodies are many different things, not reducible to a single unified definition. Depending from the point of view we are looking at them, different aspects and characteristics will be highlighted, and this leads to varied architectural consequences. There is the physical body, which comes in many different shapes and sizes, with its standard parts (head, trunk, arms, legs), composed of distinct organs. The geometry of this body has been, since ancient times, one of the core elements of architectural design. If architecture's goal is to build an artificial environment for human beings, it seems self-evident that it should start considering the basic form, size and shape of human body to adapt to its physical demands. This assumes that all bodies are, if not exactly the same, very similar, and interchangeable. We know perfectly well, however, that this is not the case. Thinking about the physical differences between a two year old child, a basketball player, a pregnant woman, and an old man only begins to scratch the surface of the myriad variety of human body types.

Our bodies also frame the way we engage with the world, our point of view is related to our height and the position of our eyes in our heads. Perception is embodied. We would understand spaces very differently if our bodies were differently composed, we could never understand the world a bat or a snake would. Besides, bodies are not static, they move and interact with environments. And there are also huge differences in how bodies engage with space, how they move, at what speed, what things they can do easily or not, how they feel, more or less comfortable, in the direct engagement with what is around them.

But then we reach another question, because bodies are also culturally constructed. In every culture there are specific things that different bodies are allowed to do, or not, there are

different ways in which they may show or must hide their physical constitution, which in turn implies both separate social capacities and differing fundamental rights. Bodies can be perfectly naked in some cultures, covered with tattoos in others, compulsorily clothed in most. In some cultures, fatness is a sign of health, in others of illness. There is a difference, then, between how a body may be quantified from a physical point of view and how it is qualified from a cultural point of view, within a given cultural milieu. These perceptions are also biased depending on social assumptions and physical differences, such as gender, race, or age. Hence the 'cultural' body is produced as a set of regulations that create particular classifications of their own.

Political subjects in themselves, actors in a complex architectural network, bodies are also subjected to the legal rules that govern a particular territory, community or country. Some of these rules are written, others not. Depending on the attributes of any given body (or how it is socially construed) it is allowed to do certain things but not others, enter into one or other type of spaces, be treated as a friend or suspect, as a guest or an enemy. Race and gender, which are apparently mere physical accidents, can construct very different types of political bodies. This happens, always, in connection with the architectural spaces that frame human activities, be it in a city or in the more private realm of dwellings.

The question posed to the students is then: how should architecture respond to, or be shaped by, this variety of bodies? Architecture has been used, and still is used, as a way of giving uniformity to these differences, but could it be used otherwise? One thing should be clear to students at this point: The human body is not an abstract entity, it cannot be understood as an abstraction of a general type, of an assorted amount of existing individuals or genres, but as an individual, with cultural, physical, political, socioeconomic and psycho-physiological differences. And architecture (or education for the matter) should not be the place where the differences are to be solved or resolved (repressed), but precisely a device that proposes ways of multiplying our understanding of bodies and from there understand bodies in spaces.

3. The differently abled body

To explore some the complex issues outlined above, we propose an approach to bodies and spaces that allows students to focus on the basic psycho-physiological conditions of both (and of architecture), and then begin to build off these basic conditions with the goal of reaching the social and political constitution of architecture within society. Starting with the received phenomena of perception that arrives from the different human senses, the students move towards how bodies then organize to identify, conform and give meaning to space, individually and collectively. Since senses and perceptions cannot be detached from the body that produces them, students will find that they need to work at different levels simultaneously, shifting between identifying themselves as sensor and sensed, as a way to construct a fully meaningful embodied perception. In order for the students to engage with how senses and perception work we proposed that they begin to test what happens when they do not work, or not properly, or work differently. By focusing on differently abled bodies, those in which one or more of the bodily senses are either amplified or dampened, they are able to narrow their research, without renouncing its complexity.

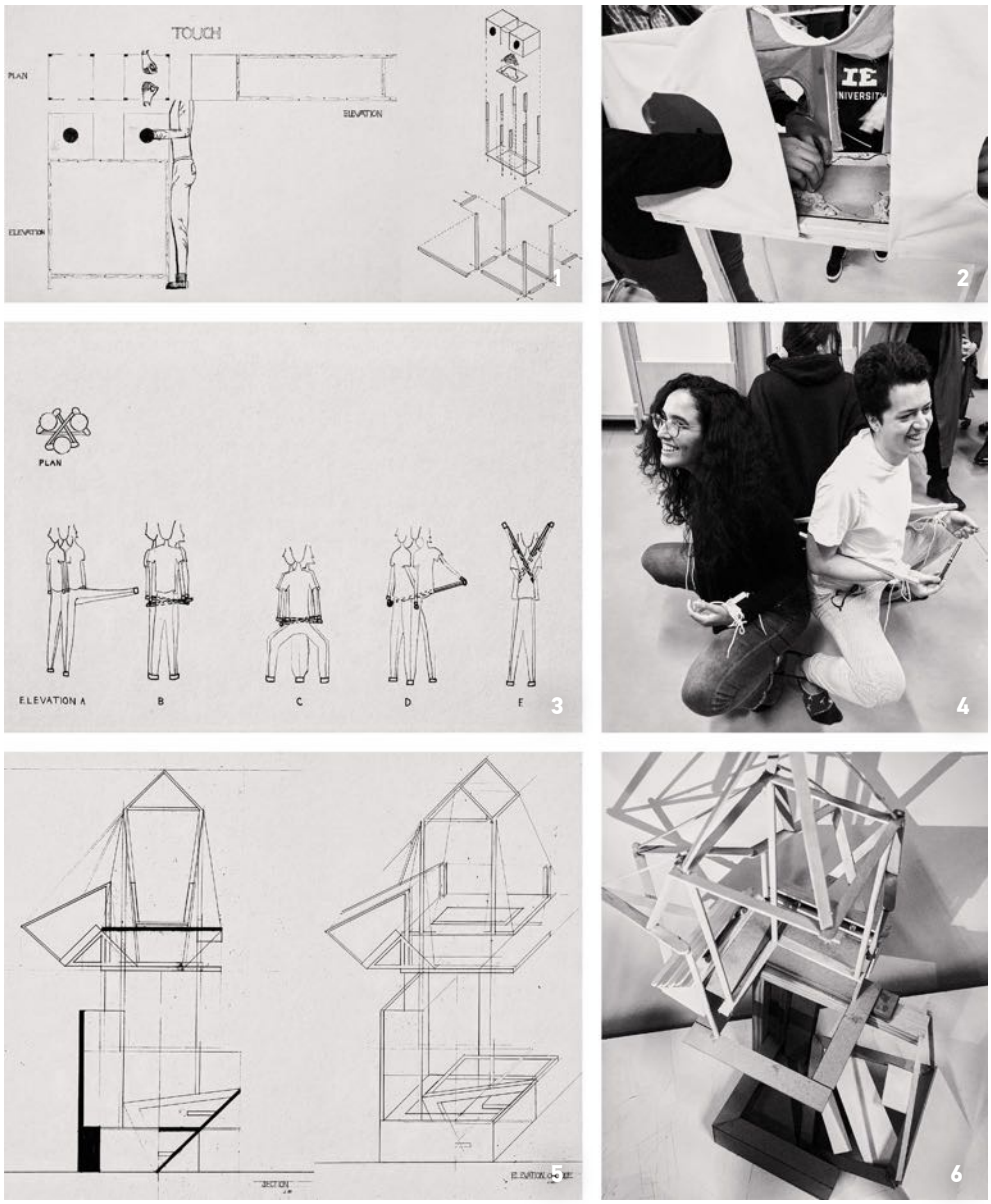


Fig. 1: Project 1: Touch machine. Plan elevation and axonometric. Students: Helena Guimarães, Farah Al-Dajani, Victoria Porubaeva

Fig. 2: Project 1: Touch machine in action. Students: Helena Guimarães, Farah Al-Dajani, Victoria Porubaeva

Fig. 3,4: Project 1: Body Monster. Students: Santiago Hidalgo, Laura Chaves, Montserrat García

Fig. 5,6: Project 2: Shared Steam-Smell Machine. Student: Rita Mantel

As professors we did not try to define what differently abled bodies are (surely not at the beginning), and we especially wanted to avoid any understanding of them as in contrast to what a perceived normal, or normalized body is. In fact, the first thing that we wanted to challenge is that 'normal' bodies even exist. For, how, and/or by whom is it decided what is 'normal' and what is not, if, as we see, there are so many differences in how bodies are constituted? Is a distinction between abled/disabled bodies even useful, or is it more a reduction of what is, otherwise, an immense richness of different ways of perceiving, understanding, using and producing space? What is in fact being abled and/or disabled? Challenging the normative is one of our concerns, but again not only for the sake of inclusivity, but more importantly to explore new design possibilities that arise from thinking of bodies as distinct entities rather than perpetuating the "standards" that persist when they are not.

The challenge for students, then, is to start designing architectural objects and spaces that explore the different capabilities of unique types of bodies, without considering any of them more 'normal' than the others, emphasizing the diverse physical, sensorial and psycho-physiological capacities of each body as a way of investigating new means of engagement with the varying types of spaces already considered. To produce different architectures out of these different understandings of space. Empathy will help them to understand other body's capacities, abilities and limitations. It should always be emphasized that designing for others is not designing for oneself. Embodied experience is personal, but empathy helps us to understand the experiences of others, it is necessary to put oneself in another's place to design spaces for other bodies and differing ways of engaging with space.

The students start designing architecture not from the point of view of the highly abstract idea of the 'general' or normally abled body, but from specific bodily conditions. The task is not to design architecture that can be used, or accessed, by differently abled people, but one that addresses the particularities of these differently abled bodies to explore new ways of understanding space. At the beginning of the semester they start working with a specific sense/body condition given by the professors that will create the specific context and program to develop distinct architectural projects in dealing with a personal/interpersonal exploration of this very condition.

Five basic senses will be considered for the students to work with: *touch, sight, hearing, smaste* (a combination of smell and taste) and *proprioception* (position of body parts and their movement or 'sense of space'). The exact number of human senses is not as easy to divine as it might seem for the students, some of them closely intermingle (such as touch and sight), and others are not so easy to parse out, such as the sense of temperature, the control of our balance when moving, or even ones that we are consciously unaware of until they stop, such as the sense of the level of oxygen in the bloodstream. So we decided to establish this basic set of five, which do not exactly align with the typical five senses the students are used to, but pushed their definitions of the senses to more specifically address issues of space.

From this point on the students engage with architectural design through strategies which emphasize a specific sense, and they try to discover how through either intensifying or dampening that sense they can create a deep and meaningful understanding of the spatial features that are implied.

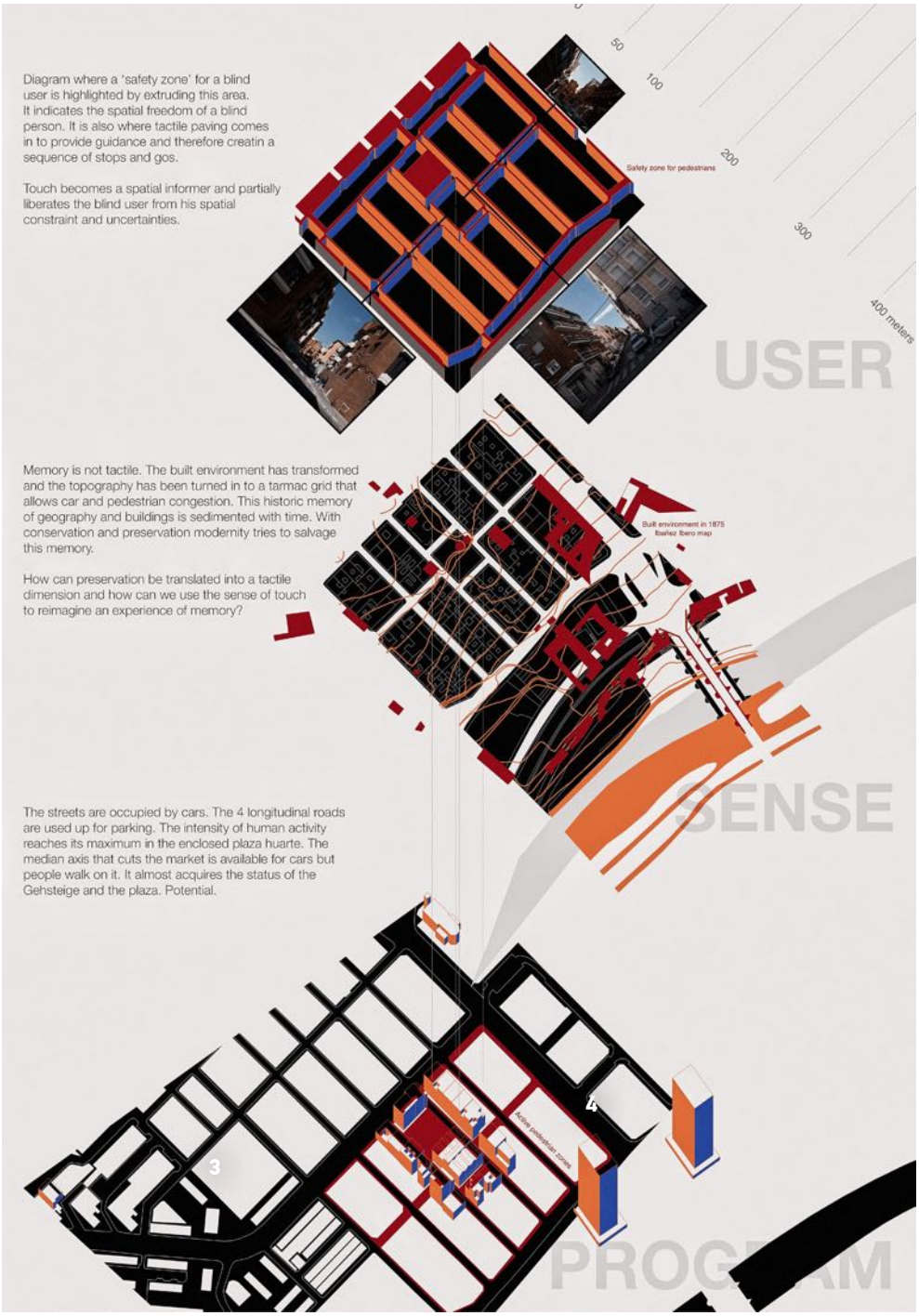


Fig. 7: Project 3: Urban Mapping, Tirso de Molina Market in Madrid. Student: Ludwig Hochleitner

The course started with the production of a one to one model project focused in body, senses and interpersonal relations, and went through several stages and scales toward a final outcome in the form of a detailed architectural project for which each student provided the main rationale (including a detailed program) in a complex urban and historical building site and its surroundings. This forces the student to explore the different sizes, scales and theoretical/material approaches to space and architecture.

4. The assignments

4.1. Project 1: Performing architecture

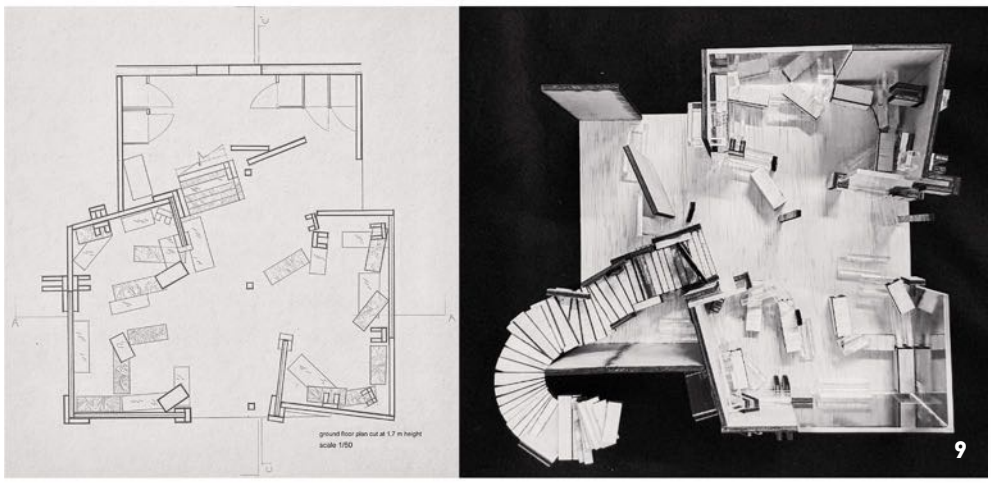
Working in groups of three, one of the five previously defined senses is assigned to each group of students. After considering how their given sense relates to the body, space and all the senses, through a series of propositions (as how can I gauge spatial distances without using my eyes, or conversely, how can I move my eyes beyond visual obstructions?) they create an object or tool that engages their body with their assigned sense but also acts as a mediator or interface between at least two people. This object is to be built up, on, from, around and/or through an armature in 1:1 scale; the given 'site' for this assignment. Through sketching/discussion/experimentation, a narrative will either emerge or be imposed on the object, which they document through drawing, video and live performance.

This first collective approach allows the students to start to dig into the complex and intimate connections of senses, body, space and society in a necessary shared (and discussed) way.

4.2. Project 2: Architecture as social interface

For the second assignment the goal is to understand and manipulate space by the introduction of architectural scale. New parameters will directly affect the artefact, moving forward in the succession: senses-body-space-architecture. Now that the student has researched how an artefact can work as mediator between body and the perception of the space, in this project they will evolve from the immediate scale of the individual human body to the broader scale of the community. A bigger artefact will then become the Architecture that interacts with, modifies and alters the physical space, the communal perception of that space and the social performance that occurs in that space. Hence, they will research the capacity of the community to perceive, comprehend, use and engage with space through an architectural artifact and, in turn, see how community and relationships between people can be transformed through architecture.

Here they keep on working with the sense from the group project but will work independently to develop an individual program. As a starting point a new 'site' is defined: the proposed architecture should move within a volume of 4 modules of 2.5*2.5*2.5 meters, composed (horizontally or vertically) to enhance the sensorial experience. By implementing a program they will define an architectural interface which will provide a new experience to the specific user.



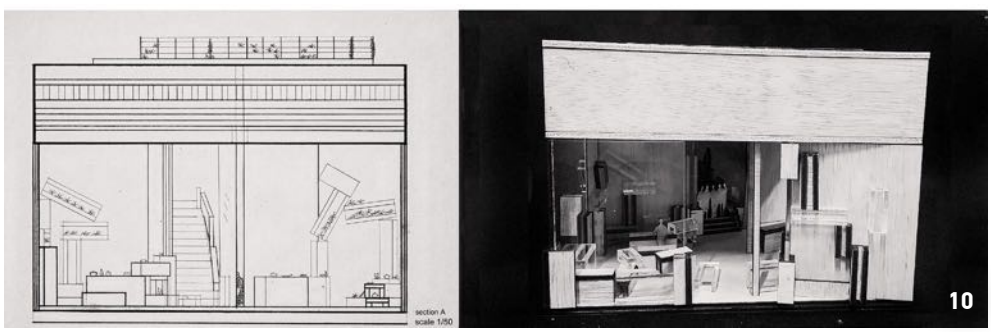


Fig. 8: Project 3: Sense Mapping: Smaste, Tirso de Molina Market in Madrid. Students: Franka Ducic Catarina Gill de Barros, Rita Mantel

Fig. 9: Project 4: The cooking Academy in Tirso de Molina Market in Madrid. Plan and Plan Model. Student: Franka Ducic

Fig. 10: Project 4: The cooking Academy in Tirso de Molina Market in Madrid. Section and Section Model. Student: Franka Ducic

4.3. Project 3: Urban mapping | Performing the site

The third stage introduces the 'real' site into the equation. Extensive mapping will help the students to engage with the complexity of a given spot in the city of Madrid. The body of the two first assignments is confronted now with the multilayered experience of the city, entering definitively into the realm of the social and the political. The students create extensive and detailed maps to address the program, the user and their emphasized sense. This engagement between senses, differently abled bodies and the urban network will be further explored from architectural design in the fourth and final assignment, while in the third assignment the student will be provided with the operational bases and tools to do it.

4.4. Project 4: Sense-Performative space

For the final project, the students have to propose an architectural intervention in an existing food market in Madrid, the object of the previous extensive mapping. The student continues to develop both the user and program developed in the previous assignment, but has to introduce them into the larger context of the existing market building and the surrounding neighborhood. Both material concerns and utilities should be addressed along with the newly grafted program. The intervention needs to co-exist with the existing building, not only structurally and spatially, but also with an awareness of the activities and daily uses of the people in the surrounding environment. This so-called sense-performative space, will redefine the market not only as a commercial structure but also as a social mediator. It will become the node where different bodies, genders, cultures and ages merge to settle the base and reshape the urban context so it can become a more inclusive, creative and engaged neighborhood. The result highlights a space designed for both a specific user and the inclusive political subject of the community.

Troublesome Pedagogies: Introducing 'Otherness' to 1st Year Design Studio

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Abstract

In the context of UK-architectural education, unstable, diverse and ephemeral bodies are usually absent from 1st-year design studios, or find 'thin' passages to their briefs through the ARB (GC5-GC6) criteria. In their common manifestations, these bodies are used as learning vehicles for introducing basic architectural tools and qualities (scale, orientation, views, materiality). However, during these initiations to embodied thinking, discussions on complexity, diversity and instability are often limited to sensory explorations or to debates on ergonomic design. These same qualities are then rarely addressed in 3rd and 4th-year of studies, where students usually work on large-scale public programs, and manage the needs of 'average' users and larger social groups. As a result, complexity, diversity and instability are then predominantly explored discursively in history and theory modules, keeping safe distance from the design studio. In Feb 2016, three female design tutors designed a pedagogical experiment that aimed at re-introducing bodies of alterity in 1st year's studios, and inspiring bodily mindful, socially inclusive and ethically weighted design strategies. SKIN was developed and tested in the frame of the Innovative Learning Week, a festival of innovative learning practices hosted and funded by the University of Edinburgh. SKIN invited students to build a theoretical, practical and embodied understanding of 'otherness', redefine it as a creative and temporal state of being, and explore how it is culturally, socially and spatially constructed. The paper interrogates the presence of 'other' bodies in 1st year design studios and ARB criteria and presents a twice-awarded pedagogical experiment to open a debate on the ***troublesome*** knowledges that the ***threshold concept*** of otherness holds for architectural education. It ultimately argues that 'other' bodies can help us explore aesthetical/technological aspects of design, promote synergies with other disciplinary-areas, raise awareness on unstable bodies and contexts, positively infiltrate 1st-year architectural education (GC1-2-3-5-6).

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1. Introduction

The complex relationship of the human body to architecture is an intimate and longstanding one, and is strongly linked to the relationship of the human body to the wider cosmos. This relationship is constantly reinvented to reflect developments in philosophical and architectural discourses that shape both. But while the debate presupposes asking both *what cosmos* and *what body*, and while *cosmos* lies always at the centre of our analysis, the body is often considered as abstract and generic, if not canonical and stereotypical, constraining significantly the course of disciplinary discussions.

Since the ontological separation of the body from the western cosmos (Plato & Hackforth 1972), dominant, stereotypical or canonical bodies worked as means to interpret, measure and design the complex realms we live in (Klein 1974). In Renaissance, for the sake of proportion, symmetry and order, these bodies were firmly constrained and defined by geometrical peripheries (Vitruvius 1913). In the 20th century and in the frame of phenomenological traditions, the geometrical boundaries are gradually questioned (Husserl 1999) but the body itself is not. Luckily, after the 2nd world war 'other' bodies claim a new relationship with architecture, bodies exhausted, traumatised, suppressed; bodies that wish to define the public realms they occupy. Santiago Calatrava, Alvaro Siza, Alice and Peter Smithson, Peter Salter, Daniel Lebbeus Wood, etc are only few of those who will re-introduce a-canonical bodies in the design process, their movement, volume, expression, materiality. It is in this historical period, that architecture becomes heavily engaged in philosophical debates that evolve around the distinction of the body to the cosmos but also of the self to the 'other' (Merleau-Ponty 1962, Dewey 1980, Haraway 1990, Levinas 1999, Clark & Chalmer 1998) and transform the discipline in education and practice.

The questions of *what cosmos* and *what body* define the core of our discipline, shaping how students, tutors and practitioners discuss, design, build and experience architecture. In the frame of UK higher education, while the boundaries of the body to cosmos are elaborately questioned through briefs that focus on creative agents, discussion on otherness or alterity are less popular. The paper discusses the pedagogical value of keeping both debates (what body and what cosmos) open in the early years of architectural education. It looks into the 'cosmos' of 1st year design studios and into the 'bodies' that rise from the design briefs shaped by RIBA and ARB prescriptions. It then presents and reviews a pedagogical experiment that took place in the frame of the Innovative Learning Festival, run and sponsored by the University of Edinburgh, to discuss 'Otherness' as a *threshold pedagogical concept* and a trigger of *troublesome knowledge* (Meyer and Land 2003). The paper ultimate aims at opening a debate on the strengths and weaknesses that pedagogies of *radical otherness* hold for architectural education and their ability to give life to novel and other-directed empathic design.

2. The body and cosmos of UK accrediting institutions

In order to understand the bodies and cosmos depicted in 1st year studio briefs in the context of UK Higher education, it is essential to look at the institutional discourses that

shape them. In United Kingdom, the Architects Registration Board and the Royal Institute of British Architects (hereafter noted as ARB and RIBA) are the main institutions that prescribe and accredit UG and PG programs at Levels Part 1, 2 and 3. And by doing so, they also define the learning process and objectives, the design briefs and outcomes, the assessment process and criteria [1]. Design studios are most affected, as their learning objectives are often literally mapped against ARB General Criteria (GCs). The ARB GCs are intimately linked to the 11 points of Article 46 of the Directive of Mutual Recognition of Professional Qualifications Directive [2005/36/EC] [2], which translates and recognizes similar degrees across all EU states. EU Directive and ARB GCs condense institutional interpretations of the complex cosmos of architectural practice into a set of prescriptions that shape the UK design education. The following passage looks at the cosmos and the bodies described in these directives and at how they silently shape the early years of architectural education.

2.1. The cosmos of UK accrediting institutions

The GC1 synopsis makes implicit reference to the complex cosmos of architectural practice (construction/structure/environment/regulations) which is then presented in greater details in GC5 and GC6 general criteria. This world is compressed in a series of concentric realms in the center of which lies the architect and which expand to meet the design team, the construction industry, the built and natural environment, the local communities, ect. These peripheries are then translated into learning objectives and development stages in studio briefs (site and context analysis, study of tectonic and construction principles, environmental considerations of safety and comfort, etc) In this frame, design studios work as deductive models of the world of practice, simple and less constrained simulations of the complex design realms that novices will face later in the carriers.

> *GC1 Ability to create architectural designs that satisfy both aesthetic and technical requirements.*
>
> *GC5 Understanding of the relationship between people and buildings, and between buildings and their environment, and the need to relate buildings and the spaces between them to human needs and scale.*
>
> *GC6 Understanding of the profession of architecture and the role of the architect in society, in particular in preparing briefs that take account of social factors.*
>
> *The graduate will have an understanding of:*
>
> - *the nature of professionalism and the duties and responsibilities of architects to clients, building users, constructors, co-professionals and the wider society;*
> - *the role of the architect within the design team and construction industry, recognising the importance of current methods and trends in the construction of the built environment;*
> - *the potential impact of building projects on existing and proposed communities (ARB 2010, 3,4,5)*

2.2. The bodies of UK accrediting institutions

In 2003, Rob Imrie was looking into the roles that the human body is given in the frame of UK architectural education and practice. Back then, practitioners and educators of architecture seemed to admit that while bodily proportions and scale played a key role in the design process, these bodies were primarily seen as standard, canonical and healthy ones. In contrast, Imrie was advocating in favor of a reflexive and open-minded architecture "*without boundaries or borders, and sensitised to the corporealities of the body. An important component of this is for architects to identify the multiplicity of corporeal or postural schemata of the body"* (Imrie 2003, 56).

But, discussion on the absence of a-typical, suppressed corporealities from architectural practice and education were not inaugurated by Imrie. They sprouted in the multiple human rights movements that rose in the 1960s and 70s and entered architectural education through the invaluable contribution of scholars like, Diana Agrest, Beatriz Colomina, Elisabeth Grosz, Denise Scott-Brown etc (Agrest 1988, Scott-Brown 1990, Colomina 1992, Grosz 1992). These critical discussions were thickly embedded in the political and social changes of the period and gave life to a wave of research projects that focused on 'other' bodies, frequently excluded from architectural debates but also from our design studios (Buse et al 2017). One would expect that these academic preoccupations would inevitable infiltrate institutional discourses and reshape educational priorities, but this was not exactly the case.

The bodies that students need to take into consideration by the end of their studies are clearly listed in ARB GC5 and 6. These are the bodies of the clients, users, constructors, co-professionals and wider society or communities. These bodies have admittedly *needs* and *aspirations*, but they are primarily plural and incidentally abstract. Their variety works as a reference to the different professional roles they play in architectural production and less on their diverse corporealities (GC9 & GC10). This is also confirmed by the fact that in the same GCs scale, comfort and safety are defined with reference to the environment and not to the user.

> *GC9 Adequate knowledge of physical problems and technologies and the function of buildings so as to provide them with internal conditions of comfort and protection against the climate.*
>
> *The graduate will have knowledge of:*
>
> 1. *principles associated with designing optimum visual, thermal and acoustic environments;*
> 2. *systems for environmental comfort realised within relevant precepts of sustainable design;*
>
> *GC10 The necessary design skills to meet building users' requirements within the constraints imposed by cost factors and building regulations*
>
> 3. *prepare designs that will meet building users' requirements and comply with UK legislation, appropriate performance standards and health and safety requirements (ARB 2010, 5,6,7)*

Regardless of how disconnected ARB general criteria seem from 20th and 21st century theoretical debates, architectural education has been quite responsive to them. Nowadays, 1st year design studios often set as an important learning objective to reconnect the human body to its cosmos, mainly from a phenomenological perspective as shared bibliographical references show [3]. Common ways to achieve this usually include:

- engagement with new art & crafts creative activities
- bodily surveys of architectural elements or spaces,
- studies of scale as proportion with reference to personalised figurines.
- the design of everyday objects, costumes and/or furniture.
- the integration of creative or performing bodies in simple design briefs.

In these initiations to embodied pedagogies, student bodies simultaneously perform as:

- novice artists and craftsmen/women, while training into new creative practices.
- imaginary users, while building an empathetic understanding of the brief-given ones.

In 1st year design studios, student bodies are questioned, negotiated, extended and stretched to meet and challenge the boundaries of the cosmos of the design brief, of the design studio and of architectural practice. To help students manage these ontological challenges, the body of the student and that of the user often merge in that of a creative 'other', maker, an artist or a craftsman as is often the case in Year 1 design briefs. These imaginary and complex creative bodies are often invented for the sake of similarity (the student and the client are both creative agents) and aim at supporting a self-referential empathic understanding of the imaginary clients.

Bodies engaging in complex creative activities seem less intimidating to design for, than aging, pregnant, transgender, demented, collective bodies. These 'other' bodies will only rarely enter the 3rd and 4th-year studios, when students work on large-scale public programmes, and manage the needs of 'average' users and wider social groups. As a result, complexity, diversity and instability, (constitutive qualities of otherness/alterity) are then predominantly explored in history and theory modules and keep safe distance from the design studios.

3. Radical otherness

The emphasis that 1st year design briefs often place in joining the creative body to cosmos are usually backed up with explicit or implicit references to phenomenological traditions. These often render discussions on supressed, a-canonical, 'other' bodies as less relevant. The problematic is also reflective of philosophical critiques to early and later phenomenological traditions (Husserl 1999, Merleau-Ponty 1962) initiated most famously by Emmanuel Levinas (Levinas & Smith 1999) and later by Cornilios Castoriadis (Castoriadis 1987), Jean Baudrillard & Marc Guillaume (Baudrillard & Guillaume 2008). From quite different angles, all

previous thinkers highlight the need for an ontology of the other, the other not as the distorted reflection of the self, but as a novel way of being. Levinas will get to the point to suggest that early phenomenological approaches are the "imperialism of the same" (Reynold 2002 69). These ethical advocations of otherness undergo a radical shift in the hands of Castoriadis and Baudrillard. Castoriadis, in particular, speaks of a novel ontology, an ontology of the other, in which indeterminacy and novelty are tightly connected. *"Indeterminacy (If it does not simply signify our 'state of ignorance' or a 'statistical situation') has a precise meaning: No state of Being is such that renders impossible the emergence of other determinations than those already existing"* (Castoriadis 1997, 308).

For Castoriadis, being is a creative process that gives life to "infinite qualities and quantities of lifeforms". In this frame, Otherness is not a stable state of being, but a poietic process of alterity strongly connected to indeterminacy, novelty and originality. *"Otherness, as alterity, is not the unfolding of some "initial" scientific conditions, and the subsequent creation of 'matter-energy", but the emergence of novelty or, otherwise, of originality"* (Castoriadis 1987, 262). These radical discussions of otherness do not simply redefine it as a reverse passage from the other to the self, but also allow us to rethink of the relationship of these 'other' bodies to the cosmos of architecture.

4. The cosmos and bodies of SKIN

In February 2016, 3 female design tutors (Aikaterini Antonopoulou, Sophia Banou and Dimitra Ntzani) designed a pedagogical experiment that aimed at re-introducing the question of *What Body* and *What Cosmos* in 1st and 2nd year architectural design studios. SKIN was developed and tested in the frame of the Innovative Learning Week, a festival of innovative learning practices funded by the University of Edinburgh. It invited students to build a theoretical, practical and embodied understanding of 'otherness' by exploring how the latter is culturally, socially and spatially constructed.

SKIN's activities evolved across 2 days. The 1st day invited students to join an informal symposium on 'Otherness', where relative notions were NOT theoretically debated. By contrast, participants discussed otherness as portrayed in the arts, performances, movies, songs, architecture etc. Key references were noted on a social media platform especially designed for SKIN as a journal of discussions [4]. These creative debates were then significantly enriched with references to personal experiences of states of otherness, temporary or permanent, initiated by bodily, spatial, cultural, social changes or developments. In preparation of this second part, various communities/groups of the University of Edinburgh, e.g. Feminist groups, the Disabled Staff Network, the Dementia Centre, the LGBT Edinburgh Community etc, were contacted, but also individuals who temporarily underwent 'othering' processes. The public call but also more personalised/group invitations brought together elderly students, feminist artists, afro-american students, students with movement impairment, students of diverse religious backgrounds, students who are carers, etc.

While the 1st day worked as a deep and demanding discussion on hard to touch topics, the 2nd day used costume making and performance to trigger creativity and play. Participants

reflected on conditions of otherness and tried to activate them during a costume making workshop. In the morning of the 2nd day, new skins were produced and tested. Participants then experienced university premises with their 'other' bodies exposing the inclusions and exclusions that very familiar to us settings supported.

The overall effort peaked in closing reflective discussions, summarised in the following bullet points:

- The complexity of non-canonical bodies. A-canonical bodies are institutionally defined with particular qualities. However, bodies are constantly negotiated and shaped by multiple additional factors (e.g. educational and financial status, racial and gender characteristics, social and cultural context etc). Institutions treat otherness as a stable condition and define it through boundaries. However, reflection on personal experiences define it as a passage or liminal state of being.
- The spatial and temporal configurations of otherness. SKIN showed that ephemerality and indeterminacy are key conditions in understanding its needs and potentials. Otherness emerges as a mode of being in particular social and cultural settings and by modifying those, it may be enhanced or alleviated.
- The extended nature of otherness. A-canonical bodies are often signified by the various prosthesis (a wheelchair, a stick, a pair of glasses, a pushchair, a carer, high-heels, a wig, etc). As such otherness can also be seen as an extended state of being, which opens up new possibility to connect to the world.
- Otherness as novelty and intuition. Both qualities are highly valued in the design studios. All participants felt that otherness allowed them to interpret, react, intervene in the complex design realms in more intuitive, socially responsive, ethically weighted ways.
- Otherness was finally discussed as a passage to empathic design/thinking, but not on the basis of similarity. Empathic design should be seen as an other-directed process, established on shared context and narratives.

5. Otherness as a threshold concept and troublesome knowledge

Naive in its conception and perhaps blunt in its realisation, SKIN opened a space to discuss and explore *Otherness* as a liminal state of being, the reverse passage from the other to the self, but also a *threshold pedagogical* concept. *"A threshold concept can be considered as akin to a portal, opening up a new and previously inaccessible way of thinking about something. It represents a transformed way of understanding, or interpreting, or viewing something without which the learner cannot progress"* (Meyer & Land 2003, 412).

In 2003, Ray Land and Jan H.F. Mayer opened a discussion on what they would later define as *threshold pedagogical concepts*. They suggested that threshold concepts can be:

- Transformative; they have the capacity to reconstruct the learner's identity and subjectivity.

- Memorable and ubiquitously present in later learning activities.
- Integrative and transgressive; as they unravel false predispositions about a discipline, and challenge disciplinary axioms or boundaries.
- Troublesome.

This last characterisation is an intellectual loan from another article written by David Perkins in late 90s and in which the author defines certain kinds of knowledge as *troublesome*, that is

- alien (not genuinely embedded within the primary discipline),
- incoherent (conflicting with popular axioms or principles) and occasionally
- counterintuitive (reluctant to serve conventional disciplinary aims or to follow methodological conventions).

For Perkins, troublesome knowledges have the power to interrupt ritual ones, activate previously inert knowledges, and radically change the ways we think and work in the frame of our disciplines (Perkins 1999). Skin was persistently working towards all these direction too.

SKIN was awarded by the broader community of the University of Edinburgh with the 'Most Experimental' and the 'Ideas in Play' awards. But it also left its organisers and participants with the bitter taste of regret for opportunities to understand and design for other bodies, and which are often lost in 1st year design brief and studios. SKIN showed that in the early years of architectural education, otherness can work as a threshold concept that changes the way students perceive their own body and that of their users'. It provoked us to cross disciplinary boundaries, and question institutional convention of the profession. Last but not least, it invited us to think of empathic design as an other-directed process rather than as a self-referential one, or one based on similarity (Gallagher 2012).

So, if creative bodies allow us to challenge our boundaries with the complex cosmos we live in, bodies of alterity can introduce a new ontological perspective in architectural education, one in which, otherness, indeterminacy and novelty are closely affiliated. In this troublesome pedagogical frame, discussions on otherness can give life to new aesthetical/technological inventions, promote new disciplinary synergies, introduce creativity as an 'othering' process and otherness as a novel way of being.

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[2] https://eur-lex.europa.eu/legal-content/

[3] The reading lists of 1st year design studios most often include references to G. Bachelard, J. Pallasmaa, J. Tanizaki, P.Zumthor, M.Pollan, etc.

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Investigating the Spatio-Temporal Potentials of Moving Body: A Case Study of Basic Design Studio

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Abstract

Basic design courses have a seminal role in first year design teaching as a foundation for understanding design principles and methodologies, and visual and formal language of design. Students develop skills of thinking and doing as they experience a journey from abstract to concrete through 2-dimensional and 3-dimensional exercises. This study focuses on a case study that investigates the pedagogical implications of capturing, analysing and materializing bodily movements by scrutinizing their spatial potentials. It is based on the design, implementation and results of 3 projects in ARCH 101 Design course configured as part of first year curriculum of architecture program at Özyeğin University Faculty of Architecture and Design in Fall term of 2018-2019. ARCH 101 Design course includes three successive projects that encourage students, firstly, to explore the spatiality and temporality of moving body and, secondly, to examine the materialization of varying fluid spatial formations through the continuity of bodily movements. The methodology of the study covers 3 successive stages: (1) the 2D analysis of movement by using the method of chronophotography and its representation as a 2D composition, (2) the transformation of 2D composition derived from movement analysis into a 3D model, (3) the design of a spatial structure by investigating kinaesthetic and volumetric potentials of motion, light and sound. Since the development of abstract thinking skills was at an early stage, the most challenging feature of project 1 and project 2 for students was the analysis of the sequences of a movement configuration by representing the changes in x-y-z dimensions of moving body. Project 1 and Project 2 constituted the basis for Project 3 in which the inclusion of light and sound elements enlarged students' perspectives to discover the spatio-temporal existence of body and the sequential continuity of space where visual and aural perceptions are embedded.

Keywords

basic design education / first year design studio / body / movement analysis / space

1. Introduction

First year design studio has a central role in architectural education. In their initial encounter with design education, students learn the basic principles of design and develop a new formal language by using 2 dimensional and 3 dimensional design elements on the basis of these principles. They are encouraged to develop new ways of looking, seeing, observing, analysing and visualizing by exploring and using different media [1,2]. Thus, for students who are unfamiliar with the process of designing, first year design education is the starting point to develop "designerly ways of knowing" [3,4].

Although there is a variety of pedagogical approaches applied in the first year design teaching, the motion studies have a special role. Motion is emphasized as a creative starting point for abstraction. The motion studies targets fostering students' creative and critical thinking skills by documenting, analysing and materializing bodily movements. This paper aims to discuss and criticize the process and products of a case study that has been experienced in the first year design studio ARCH 101 in 2017-2018 Fall Semester.

1.1. A Phenomenology of Movement

An "embodied" perception and conception of space, which originates from an emphasis on bodily awareness, is usually addressed in current approaches to design pedagogy [5,6]. Movement is central to such a temporal understanding of space since it reveals diverse spatial possibilities by challenging the static perspectival representation of space in favour of the varied possibilities of fluid and dynamic spatial formations [7]. The concept of embodiment as a reference point for our conception and perception of space is not merely discussed in field of design education; it is also addressed within phenomenological theories of body. Starting from the criticism of dualistic paradigms in which mind and body, idea and phenomena are treated as separate entities, phenomenological philosophy is informed by a holistic understanding of body and of spatiality embedded in our bodily existence. In the view of Maurice Merleau-Ponty, space is "already built into my bodily structure and is its inseparable correlative" [8]. For Merleau-Ponty, perception is a means through which we establish an unmediated relationship with the world [9]. In the perceptual realm, movement is regarded as a bodily experience in which "the spatiality of body is brought into being" [10]. This body differs from the static conceptions of human body like the Vitruvian man or the Modulor man [11]. It is a perceiving subject who inhabits space and time, and movement is presupposed in the spatio-temporal existence of this phenomenal body [12].

1.2. Movement in Architecture

Movement, designating a flow of change that is continuous and cohesive, became the subject of studies in the fields of performing and visual arts, design and architecture throughout the twentieth century. The chronophotography technique developed by Etienne Jules Marey to visually document the sequences of bodily movements helped developing a universal language to code the continuity of movement as a series of fractional and uneven movements [13]. Rudolf Laban developed a movement analysis system for observing,

analysing and understanding movement by placing the body at the centre of his studies. Laban emphasized dance –choreography- as an essential means to help the body establish relations with the rhythms and dynamics of the nature [14]. The 3D geometric-space models developed by Laban through the use of 5 platonic solids, aimed at visualizing the intellectual and perceptual impulses of the dancers. The analysis of human body and movement was also at the centre of Oskar Schlemer's studies in Bauhaus Theatre workshop in the 1920s. Schlemer investigated the human body as a means of measurement of the world through its movement. He developed courses that aimed to investigate human biology, mechanics and kinaesthetic through the abstraction of human form and its representations by costumes [15,16]. The Triadic Ballet was an experimental study of the relationship between human body and space in fusion of dance, costume and music. The geometric costumes were used to test the geometric flexibility and fluidity of the human body and they served for making visible how the volumetric space is transformed through movement. The question of movement as a generator of spatial experience and form influences recent studies that investigate the relationship between architecture and motion. While some studies investigate how the movement analysis can help develop new methodologies to analyse the spatiality of built space [17,18], the influence of dance theorists on architect's geometric sensibilities and formal constructs in architectural design processes is also investigated [19].

2. Methodology

The methodology of this study covers 3 successive stages: (1) the 2D analysis of movement and its representation as a 2D composition in the form of collage, (2) the transformation of 2D composition derived from movement analysis into a 3D model, (3) the design of a spatial structure by investigating kinaesthetic and volumetric potentials of motion, light and sound. It is based on the design, implementation and results of 3 projects in ARCH 101 Design course configured as part of first year curriculum of Bachelor of Architecture program at Özyeğin University Faculty of Architecture and Design in Fall term of 2018-2019. The objective of ARCH 101 course is, on the basis of manifold elements of the abstract space, to help students cultivate basic design principles and skills, which in turn may establish a ground for introduction to architectural design. ARCH 101 Design course includes three successive projects that encourage students, firstly, to explore the spatiality and temporality of moving body and, secondly, to examine the materialization of varying fluid spatial formations through the continuity of bodily movements.

3. Findings and Discussions

In all three projects, the tasks were designed in a way to encourage students scrutinize the key role of human body in the cognition and perception of space at the early stage of their first year education. With an emphasis on the mind-body integration, the students were introduced with the idea of conceiving the human body as a source of form. Movement was a vehicle to develop an awareness of the subjectivity of bodily experiences, and to reflect on

different explorations and formations of space. At this point, choreography was utilized as a technique of articulating bodily movements with reference to a program, in consideration with the basic design principles such as organization, equilibrium, unity, scale, proportion, harmony and hierarchy. Choreography addressed the notations in specific trajectories of time. In this way, the development of bodily awareness served as a way to develop spatio-temporal awareness for students of architecture and interior architecture.

3.1. Phase 1- 2D Analysis of Movement

The objective of Project 1 was to make an analysis of movement through abstraction and its representation in 2D format. By focusing on the relationship between movement, rhythm, and time, students were expected to inquire the geometric articulation of space that is occupied by the moving body. In the first exercise, students questioned the transition of the motion sequences within the wholeness of motion. 2D movement analysis and its representation was based on a 30 seconds video that recorded the movement configured and realized by an individual body. Students utilized from the method of chronophotography: they took A4 printouts of numerous snapshots of the movement sequences, arrange them in a way to show the continuous flow of bodily movement and made sketches of the movement sequences by abstracting them. Students mainly used linear and planar elements while abstracting the human body in motion. Besides making sketches, the students utilized from the collage technique by using opaque, transparent or translucent materials on an A3 black cardboard. This helped them represent the change in the x-y-z dimensions of the moving body and make visible the overlapping and intersection of movement sequences.

The challenges of Project 1 for the students were both the abstraction of the human body in 2D composition and the analysis of the fluidity between movement sequences. Students divided the body into upper body (arms) and lower body (legs) and analysed them according to different kinaesthetic exercises such as hands clapping, handstand, jumping, dancing, etc. The studies varied due to the level of abstraction. In some studies, while the level of abstraction was good, students had difficulties in expressing the inter-sequence transitions that result from fluidity of movement [Fig. 1]. Some studies focused on the volume occupied by the body (solid) rather than gap between different bodily sequences (void) through the use of linear and planar elements [Fig. 2.]. There were also studies in which the solids of moving body and the voids in-between solids were enmeshed [Fig. 3]. The use of transparent surfaces allowed identifying the transitions and overlapping relationships between sequences [Fig. 4]. Gradation of colours (white, light grey, dark grey) helped to represent foreground-background relations between bodily sequences [Fig. 5]. When Project 1 is considered, to transform an abstract phenomenon into concrete and to develop a geometric language for its representation were the major tasks that the students confronted at an early stage of the development of abstract thinking skills.

3.2. Phase II - 3D Model of 2D Movement Analysis

The objective of Project 2 was to transform the 2D movement analysis that was developed in Project 1 into a 3D model by inquiring the spatial potentials of the geometric abstraction of

Fig. 1-4: Student works of the 2D and 3D abstraction of movement.

space occupied/articulated by the moving body. Students were expected to design a uniform volumetric structure for representing the spatio-temporal potentials of the moving body.

Constructing a timber/balsa frame in A3 format with depth of 15 cm was the first step. This volumetric frame served as a void in which the spatial potentials of movement could be represented in a multidimensional way; a limited composition area was defined in consideration of all design principles. Students scrutinized the design of form and the organization of multiple forms in order to represent the volumetric flexibility, fluidity and holism of movement. For this purpose, they examined the potentials of different materials and dealt with the issues of detail solution and structural stability. Students had difficulties in converting the shapes that represented the motion sequences in the 2D composition into 3D forms. Studies in which movement sequence were represented through a solid geometry as a plastic form had difficulties in expressing the z-dimension of the sequences; what is more, the representation of the fluidity of volume created by the moving body and the inter-sequence transitions remained weak [Fig.2]. However, in the studies where the motion sequences were expressed with linear and/or planar elements instead of solid geometries, the fluidity of movement and its volumetric integrity were expressed more competently. The use of linear elements such as wicker rope, metal wire or wooden sticks strengthened the fluidity and depth of volume through the transparency created between sequences; yet, it entailed defining the surfaces occupied in void by the use of solid, opaque or transparent materials [Fig.4, Fig.5]. The use of only planer elements made it harder to represent the transitional spaces; in that case, students generally used linear elements in the aim of connecting the sequences of the moving body [Fig.3].

3.3. Phase III - Materializing the 3D Volumetric Potentials of Choreography

The analysis of movement in Project 1 and the examination of movement's volumetric characteristics in Project 2 were elaborated further in Project 3 with the inclusion of light and sound phenomena into the inquiry of the spatio-temporal potentials of the moving body. In Project 3 students examined motion, light and sound as space-making elements. Students were expected to start the design process by critically reflecting on the concepts of motion, time, space, structure, light/shadow effects and sound. They formed student groups of min. 5 and designed a choreography that covered bodily movements in x-y-z dimensions utilizing from some kinaesthetic tasks such as rising, decreasing, stopping, starting, continuing, displacing, combining, separating, zoom in, or zoom out. Students took A4 printouts of numerous sequences of the 3-minute-long choreography that would capture the stages of the movement patterns and arrange them in a way to show different movement configurations. They also analysed the rhythmic characteristics of sound element and the shadow effects of the light element that were integrated into the choreography. Students first analysed the whole choreography and tried to summarize it as a schematic diagram. This was a constructive stage towards the design of 3D spatial structure.

The phenomenon of motion was examined with reference to the related concepts of limitation, intersections, formation, transformation, fluctuation, starting, disturbing, displacement, orientation, and acceleration. Since motion has a changing character, an attempt to define motion as a structure designates a process from the part to the whole.

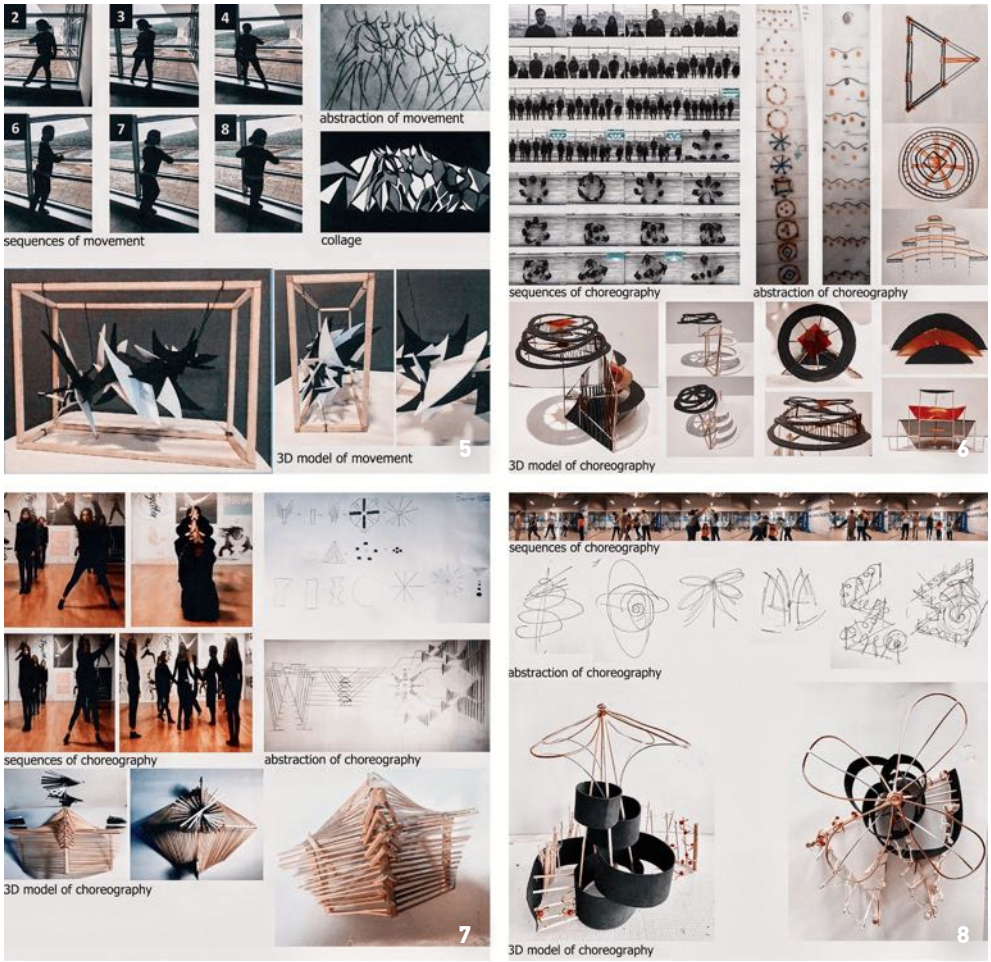

Fig. 5: Students works of the 2D and 3D abstraction of movement.

Fig. 6-8: Student works of the materializing the 3D volumetric potentials of choreography.

The time element that is embedded in movement was also questioned by focusing on the dualities of temporariness/permanency, static/fluent, limitation/limitlessness, present/future, and linearity/cyclicality. Structural investigation addressed part-whole relationality, system components, detail, flexibility and stability. The potentials of light as a space-making phenomenon was scrutinized with reference to the concepts of visible/invisible, tangible/intangible, view/reflection, continuity, passage, perspective, border/threshold. Students were expected to critically think about the various roles of sound in our bodily perceptions as a medium to articulate space: how sound gives directional indications (background-foreground), orientation (near-far), transition (boundary-threshold), and continuation (repetition). To analyse the choreography video and to draw the diagrammatic sketches of the analyses were the first steps of 3D design process. Students first analysed and abstracted the patterns of movement in x-y-z dimensions and, then, they interpreted the composition of the choreography as a uniform structure. The bodily movement in x and y coordinates (front view) and in z-coordinate (top view) were analysed. In motion analysis, while the body was treated as a unit element, they examined the area defined by the displacement of this unit element. The general tendency was to divide the choreography into successive parts and the fragmentary analysis of the choreography was mostly successful.

The space occupied/articulated by the moving body and the geometry it created were represented diagrammatically. The main problem was related with the lack of a holistic analysis of the choreography fragments that were successfully analysed separately. In the analysis of the light element, the areas scanned by different parts of the body were transformed into 3D geometries. The shadows formed by the body on the horizontal and vertical planes according to the angle of light source were examined and these shadows were represented through the use of linear and/or planar elements. In the analysis of the sound element, the sound of the moving hands and arms were mostly represented by elements of point (source of sound), line (reflection, diffraction), or plane (enclosure, edge, extent). According to the repetition of sound, the compositions were obtained by repeating these linear/point elements in the void.

When the studio outcomes of Project 3 are analysed, it can be discussed that the students mostly had difficulties in achieving a holistic analysis and geometric abstraction of motion, light and sound phenomena as enmeshed elements of a choreography [Fig. 6, Fig.7]. In the studies that fulfilled the requirements of the project, integrity was achieved in two ways: (1) the structural integrity (integration of different design elements and materials), and (2) the design integrity (the volume-forming elements establishing a holistic design language). An integration problem was observed in the diagrammatic analysis of choreography. The movements that make up the choreography were well analysed one by one; yet, the studies that could produce a whole by bringing these analyses together were still in the minority. This problem of the lack completeness also manifested itself in 3D models. Some studies attempted to capture the exact 3D equivalent of the geometric abstraction of the movement analysis [Fig. 8]. Instead of capturing one-to-one geometric equivalents of the analyses, the projects that continued to developed the abstraction process further in 3D model design as well, were able to capture both structural stability and design language and they were very complex spatially [Fig. 9, Fig.10].

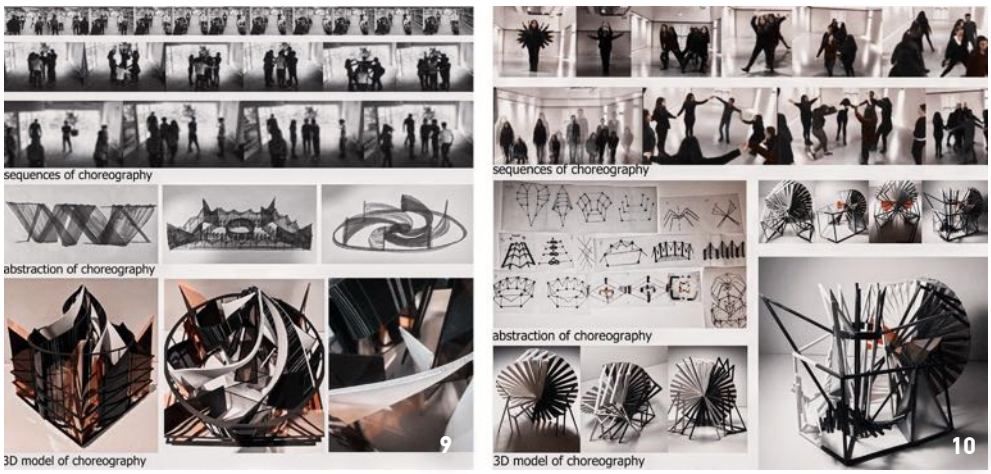

Fig. 9,10: Student works of the materializing the 3D volumetric potentials of choreography.

4. Conclusion

To investigate the key role of motion studies as part of an experiential approach to teaching 1st year design in architecture was the core issue of interest in this study. The interaction between body and space was examined through the spatial and temporal state of our bodily existence, and movement has been a means of this examination. It is aimed to reveal the perceptible dimensions of space by focusing on the space articulated by/through movement. Students experienced the processes of perceiving the invisible space, discovering the tools necessary to make it visible, and finally constructing the space of motion by using these tools. The case study of three projects realized in the basic design studio was a challenge for design students to develop a bodily awareness and to reflect on the spatio-temporal potentials of bodily movements. Students were encouraged to learn through their bodies with reference to multi-sensory experiences of space. They were introduced an alternative conception of space: space is not only a static phenomenon composed of tangible elements, but also a dynamic structure that can be defined by means of intangible phenomena such as motion, light and sound. These projects helped students to develop abstract, analytical, diagrammatic and creative thinking skills combined with skills of doing through hands-on experiences. The cultivation of geometric/formal sensibilities along with material and structural knowledge supported the development of their design skills. In conclusion, this studio process has been an experience that triggers the 1st year design students to go beyond the familiar perceptions of space, look from alternate perspectives, explore the relationships, and design the tools necessary to express what has been explored in new and creative ways.

Acknowledgements

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Form & Order

The Education of the Architect. A Point of View: Space and Body

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Abstract

The paper examines the importance of the 1st exercise in the curriculum of architectural education we introduce, in the first year studies in the school of architecture NTUA, the criteria upon which this exercise is chosen, the focal points, the process development of the exercise and the actual results, presenting the student's work of the recent Academic year. The introduction to architectural design is taught as an entity, in the 1st and 2nd semester of architectural studies, in the School of Architecture NTUA as a compulsory course, It is part of a nine semester curriculum, where the architectural design studio composes the main corpus of the studies. Methodologically, the design process runs through the academic years, focusing on all architectural scales, from the urban scale, the building and the object, to the space in general. The architectural design studio during the 1st year (2 semesters), consists of a sequence of 4 exercises, that vary in scale and requirements. The course begins with an analysis and interpretation exercise, where students are encouraged to describe and represent places, thinking about spatial relations, then the exploration of spatial properties it follows, as a 2nd exercise, applying abstract, compositional decisions, within organized rules, to focus on spatial figures. The 1st semester finish with an exercise focusing in the organization of movements and the creation of places for stasis. The 4th exercise (2nd semester) emphasize a site specific project, with brief, material and structural requirements. The subject of the first exercise introduces to the students the significance of understanding the space and its spatial properties, in relation to the human body, it investigates the ways that "we see" and "comprehend" and it elects the importance of "the architect gaze" through the recognition and simultaneous recording human activities and the spatial properties in the environment in which they take place. The human body and the space are connected with a dynamic relation according to which they convert and influence each other. Focusing on the dipole spatial properties/human activities, the architectural investigation explores the correlation of space and basic human activities, such as running - walking - standing - resting, recording different ways of moving or sitting, and the spatial properties of the particular places in which they take place.

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This process is realized through an architectural promenade in the city, following a specific way. The students investigate Aeolus street, a main pedestrian axis in the city of Athens's historical centre. The aim of this exercise is to develop the understanding of different ways of seeing and interpreting architectural space, expressing and presenting their experience, through drawing sketches, pictures, etc, but mainly to point out the importance of the deep comprehension of space and it's properties in correlation with the human body and activities.

Keywords

architecture studies / special properties / human body / dance / human activities

1. Introduction. Studies in the School of Architecture, NTUA

The introduction to architectural design is taught as an entity, in the 1st and 2nd semester of architectural studies, as an introduction to architectural synthesis in the School of Architecture NTUA. It is part of a nine semester curriculum, in which the architectural design studio composes the main corpus of the studies.

Methodologically, the design process runs through the academic years, focusing on all architectural scales, from the urban scale, the building and the object, to the space in general. The sketch, the drawings, particularly the section, handmade and 3d models and computer-generated images, all constitute some of the main tools of this design investigation.

Considering that during the design process, the study goes through different scales according to the needs and requirements of the program, it is worth mentioning that they do not function independently, but tightly interconnected, the cohesiveness in the way of thinking and the relationship between the parts and the whole. This principle is taught as the central axis of the teaching method.

This design studio, in the 1st semester, is mainly referred to the introduction of the basic architectural concepts related to the properties of space and its components, its geometry, its basic vocabulary, its comprehension, and the means and techniques of its representation. The basic parameters of movement, scale, proportion and natural light are introduced, as well as the structure, the corporeity and the elements of construction.

It is by the 2nd semester, that the first approach of the process of architectural composition (synthesis) is introduced: conception, research, formulation, elaboration and presentation of the idea.

The project-based teaching is undertaken in studio sessions and by individual tutorials. The first semester is articulated by three exercises, although in the second semester only one project is running, in which, for the first time, the students are tasked with the composition of a small building.

In this paper, the issues, the methodology of approach, and examples from the student's work will be analysed, all concerning last year's studio, for which I was the responsible supervisor.

2. The first exercise

Assuming that new students arrive with cultural preconceptions about design that need to be expunged, the necessity to instrumentalize a program of "forgetting" to focus on the purity of autonomous architectural problems bears to be quite obvious.

As it is prescribed in the curriculum of Yale university, under the title "Formal Analysis" by P. Eisenman *...The most difficult thing for an incoming graduate architecture student is 'learning how to see' as an architect is. All graduate students in architecture believe, because of a lifetime of being in and around buildings, that they know what architecture is; they already think they know what their subject is. Therefore, the first activity in this class is one of un-learning.* [1]

Each student has to constitute a particular, "personal" way in which "he sees". On the occasion of this exercise students are encouraged to conceive and interpret objects and places, seeing behind the visible and obvious, think analytically, developing a creative eye [2] with confidence and critical thought, disputing their stereotypes.

As Ernest Gombrich [3] insists.....*" is that there is no innocent eye. The eye comes always ancient to its work, obsessed by its own past and by old and new insinuations of the ear, nose, tongue, fingers, heart and brain.It functions not as an instrument self-powered and alone, but as a dutiful member of a complex and capricious organism. Not only how but what it sees is regulated by need and prejudice...but reception and interpretation are not separable operations; they are thoroughly interdependent,* [4] as in the case of the first year students.

Within this framework, an argument can be made that the first exercise is to provide a practical and theoretical introduction for the students of "how to see and perceive as an architect", through process that focuses on the way of seeing and relatively understanding the immediate environment. It also offers an opportunity to express themselves using the basic techniques of sketching, painting, photography, video etc.

Thus, the students are introduced to the significance of space interpretation, investigating the ways that "we creatively see" and the importance of "the architect's gaze" is elected through recognition and simultaneous recording of the urban environment. Several ways of looking through the experience, the thought, have been examined and their content has been analysed.

Since the architectural elements that make up the principles of architectural composition, (such as movement and stasis, open and closed, scale, proportions, structure, corporeity and construction, human actions and life), can be clearly observed in the city scale, experiencing a city through a promenade is proposed.

I experience myself in the city and the city exists through my embodied experience. I confront the city with my body, my legs measure the length of the arcade and the width of the square. My gaze unconsciously projects my body onto the facade of the cathedral door and my hand gasps pull as I enter... [5] Juhani Pallasmaa says.

The students are encouraged to make sketches, and preliminary drawings, particularly sections, perspectives, take photos, videos etc, all constituting some of the main tools of this design investigation.

Aldo Rossi in his book, A Scientific Autobiography, describes *...I walk the cities of Europe to understand their plans and classify them according to types...I was discovering my own architecture. A confusion of courtyards, suburban houses, roofs, gas storage drums, comprised my first exploration of*

Milan that seemed fantastic to me. The bourgeois world of villas by lakes, the corridors of the boarding school, the huge kitchens in country houses were memories ...Yet their insistence on things revealed a craft to me. [6]

3. The method: observe = see and comprehend

This process takes place through the exploration of a part of the city of Athens, following a specific route.

In parallel, the use of an analytic method that deploys a wide variety of examples is proposed, through the reading writings of authors describing relevant issues.

With both Aldo Rossi's "A Scientific Autobiography" and Juhani Pallasmaa's, "The Eyes of the skin: Architecture and the senses", the conceptual underpinning for the exercise it is provided.

Also, Walter Benjamin's description of the city of Naples from the book "Selected writings vol.1", 1913-1926 is analyzed.

Our specific analysis is focusing on the dipole: spatial properties-human activities, exploring the human body and its relation to the space, as it moves, acts and lives in such an urban environment. The body and the space are connected with a dynamic relation according to which one converts and influences the other.

The space of a city, as well as that of a building, includes not only the internal space, but also the space around, under and above it: the streets, squares, plazas, landscapes, gardens and roof gardens. It also includes transitional spaces such as porches that link the inside and outside, boundaries, gradations of limits and scale, as open - closed, public-private, in between spaces. By the experience of such an urban space we can recognize size, proportions as big, small, high, low, above -under, properties like transparency, porosity and conditions like light, shade, changes during time, day and night.

Selecting an action that has relation to the open space of the city, such as running, walking, standing and resting, the architectural investigation focuses on the exploration of those basic human activities and the required space they need, as we believe that all those personal or social activities, which differ from person to person, are human rituals of the everyday life and have a direct relation to the environments they take place.

The main argument is that the architectural work is very close related and in continuous interaction with the actual "place", with the natural and urban environment. Consequently, the recognition and comprehension of the characteristics of "place" are fundamental in the study of architecture. Recognizing "place" as a socio-spatial entity, with individual elements

Fig. 1: Aeolus st. (a) Google map (b) north-south view

Fig. 2: [a) Drawings Mirsini Asimaki (b) Pedestrian's flows, drawings Ch. Charalampaki, Mar.Kourouvani.

Fig. 3: (a) Drawings Mirsini Asimaki (b) Pedestrian's flows, drawings Ch. Charalampaki, Mar.Kourouvani.

and characteristics that constitute and create its atmosphere or 'genius loci', we examine the spatial properties of the areas in relation with the human activities where people live and interact, move, stand, act and feel, in numerous ways.

As B. Hillier pointed out: «... *the architecture gives form in space, it structures a system of space in which we live and move, this influences the social life, from the moment where it provides the conditions for the way of movement, it produces social relations. Consequently the architectural decisions on the built form are of strategic importance as the territorial organization can have social consequences... »* [7]

4. The place: Aeolus street.

The place is important to our understanding, for it provides both physical and social context. Our group investigates Aeolus street, a main pedestrian axis in the city of Athens's historical center. (see Fig.1)

This particular place of the city, is one of the most important axes of the historical city center. It constitutes the natural extension of Patission st., it connects Omonia with the place of Monastiraki, facing north-south towards the Acropolis, where the Parthenon is visible from every point of this street. Various spatial properties of the street can also be observed from place to place.

5. The Process

The students have to create a script connecting the activities mentioned above with proportional / territorial relations and attributes. They can try to work comparatively using similar or opposite subjects, seeking territorial data and describe them with spatial – architectural terms, in combination with elements of movement and people's actions.

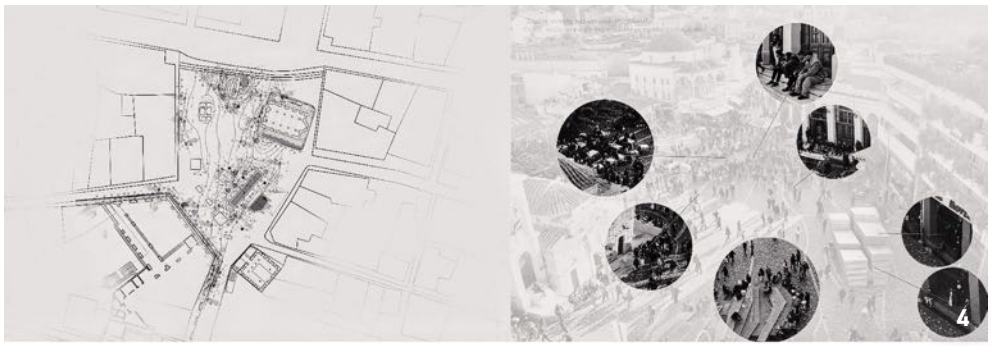
The way people move describes a way of perception of space and the facts that occur on it, but also presents the special properties of continuity and discontinuity.

Their observations can be expressed by mapping: Mapping movements, Mapping Figures, Mapping activities, Mapping relationships, and Mapping spatial conditions. (see Fig.2)

The exercise takes place in two phases with a total duration of two weeks:

1st phase: recognition, comprehension, recording and analysis: mainly with sketches, photographs, video, notes etc of the architectural characteristics of the area and choosing a specific site where the action will be recorded. Focusing on a subject that they are interested in, as a picture, a snapshot, a continuation of pictures or discovering this using a word – an architectural notion like boundaries, movement, speed, attitude, transparency, interruption.

2nd phase: I observe = I understand- interpretation - presentation. Focusing on the specific site a deeper analysis of the architectural characteristics of the area they have choose to investigate the action, analysis and interpretation and what they observe and comprehend



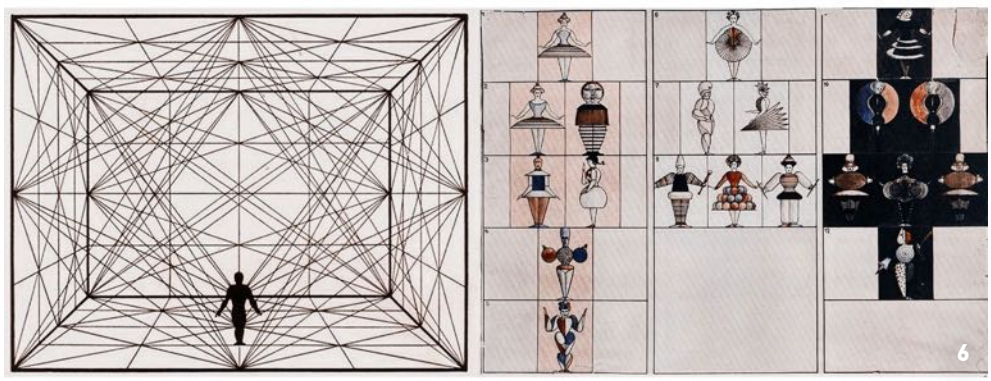


Fig. 4: Mapping movements activities spatial properties. (a) Map of sitting preferences in the plaza (b) People prefer to stand or sit mainly at the perimeter of the square facing the plaza

Fig. 5: Analysis of the Monastiraki square –body figures and shapes. Photos by Ch. Charalampaki, Mar. Kourouvani.

Fig. 6: "Slat Dance" ballet conceived by Bauhaus artist Oskar Schlemmer in the 1920s [11]

Fig. 7: Choreography workshop (photos P.Vasilatos)

behind the picture, cross-correlation with social, historical, and qualitative elements of place and presentation of those interpretations in 2 A1 posters. The presentations should outline an idea for the drawing or put forth a short description of the place that may, in turn, inform the drawing. (see Fig.3)

6. The References: space-body-dance

The ideas about space and its relation with human behavior are presented during the semester, as a number of references based on Jan Gehl's [8] and William H. Whyte's [9] studies regarding life in public spaces.

A case study [10] is analyzed, concerning Monastiraki square in Athens, which examines the square through the analysis of human behavior, using a combination of observations on small and large scale. (see Fig.4,5)

Since human activity is the element that assigns meaning to public spaces, this observation can provide useful data for their function.

Also, celebrating 100 years of Bauhaus school of design, architecture, and applied arts and its influential ideas as far as the teaching method is concerned in relation to dance and theater, the correlation of space -body and dance, as a tool of the above mentioned part of the city exploration is proposed.

The relation to the body and dance is introduced, as a case study considering spatial relationships between dancers or between dancers and objects, and is very much connected with the design.

During the course, we have been referred to Oskar Schlemmer's work in Bauhaus. The main feature of analysis is a specific costume designed by Schlemmer. This costume connects poles to the body of the dancer in order to limit his movements, but also to underline the direction of the movements in space.

In Schlemmer's research, the poles refer to the lines which relate the human body to the abstract space around it; they are a visualization of "the invisible linear network of planimetric and stereometric relationships".

The main feature of analysis is a specific costume designed by Schlemmer. The costume turns the body of the dancer into an abstract figure, capable of describing space through geometry and movement.(see Fig.6.) Also, more recent examples like the work of Sasha Waltz [12] are presented.

In parallel, a choreography workshop that aims to explore space through dance is applied. As an example, and as a visual experience for the students, a performance named "Human construction" by Sofia Kondylia, an architect and choreographer, was presented.

It is an interactive solo piece based on interdisciplinary research "Architecture + Dance", speaking about artistic creation, about creating spaces through sensing our bodies' (inner) movement."Real spaces, where body action lives, and platonic spaces, where ideas can exist..." [13]

The performance had been performed in the inner courtyard of Averof Building NTUA, presenting various ways of understanding the human body, through dancing movements, using various means, and outlining the boundaries of human body and the spaces every movement needs to be expressed, and is positioned in a specific area. (see Fig.7.)

The students have the opportunity to realize the bodily experience in connection with the space through dancing movements. This also helped the students to find out the relations between architecture and arts like dance.

During this performance the students had the possibility to explore the dancing performances as a way to understand and prescribe spatial properties.

Concepts such as beside, in front of, over, through, around, near or far can be found in dancing movements.

Notions and relations can be observed in a dancing performance such as axiality /centrality, enclosure, boundaries transparency, porosity, flexibility, material/ immaterial atmosphere, inside /outside, closed,/open,/in between lightness /darkness, rhythm,/ sequence, order / disorder, proportions / scale high /short, open /closed.

.....Dancers interact with space in many ways. They may stay in one place or they may move from one place to another. They may alter the direction, level, size, and pathways of their movements. The relationships of the dancers to each other produced spatial relations. Even when a dancer is dancing alone in a solo, the dancer is dynamically involved in the space of the performing area so that space might almost be considered a partner in the dance. Spatial relationships between dancers or between dancers and objects are the basis for design concepts such as beside, in front of, over, through, around, near or far. We can describe the space through which the dancer's body moves with architectural terminology like level, size, direction, pathway, focus. Also Time is applied as both musical and dance elements, beat, tempo, speed, rhythm, sudden, slow, sustained. Force/Energy: the force applied to dance to accentuate the weight, attack, strength, and flow of a dancer's movement (sharp, strong, light, heavy, bound, free-flow). [14]

7. Conclusions

This paper examines the importance of the 1st exercise in the curriculum of architectural education that we introduce, in the first year of the studies in the school of architecture NTUA, the criteria upon which this exercise is chosen, the focal points, the process development of the exercise and the actual results, presenting the student's work of the recent Academic year.

Through this analysis, the importance of understanding the human body and the relation to space has been pointed out. Considering that movement is an important aspect, an approach that has to do with the properties of human body is applying, connecting the dance and the space as a way of understanding spatial properties in connection with the activities that take place.

The educational goal lies in the way that students understand the field of recording human activities and spatial environments, their ability to use different techniques of representation, but also getting familiar with ways of presenting their ideas.

The exploration of Aeolus st. through analyzing human behaviour, understanding the function of the street through various methods and scopes, served as the starting point for certain observations.

Since human activity is the element which assigns meaning to public spaces, this observation can provide useful data concerning their function. At the same time, re-evaluating a space can lead to avoiding repeating dysfunctions during the design process.

Each space has its own needs and demands, and establishes its function as a complex issue. Given the significance of public spaces and their essential role in the creation of urban life patterns of a city, an approach which leads to conclusions regarding the relation between space and human behaviour can be proven very useful and beneficial.

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[8] Gehl, Jan, 1987, Life between Buildings: Using Public Space, translated by Jo Koch, New York: Van Nostrand Reinhold. As Jan Gehl states, what separates the designer from the user is that the former sees and comprehends the project on its whole, while the latter only perceives a very small portion of it, which is limited to what the eye can see.

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[10] Human behavior and activity in public spaces, The case of Monastiraki square in Athens. Christina Charalampaki, Maria Kourouvani, Dimitra Nikolaou, Changing cities III proceedings,Siros, 2017

[11] The main feature is a specific costume that connects poles to the body of the dancer in order to limit his movements, but also to underline the direction of the movements in space. In Schlemmer’s research, the poles refer to the lines which relate the human body to the abstract space around it; they are a visualization of “the invisible linear network of planimetric and stereometric relationships“.At the same time, the costume turns the body of the dancer into an abstractfigure, capable of describing space through geometry and movement. http://socks-studio.com/2017/07/19/when-body-draws-the-abstract-space-slat-dance-by-oskar-schlemmer/

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Formal Strategies of Familiarization and de-Familiarization

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Abstract

In the first-year design studios, discussions on form tend to be avoided; for those un-initiated in architectural thinking, forms may easily be associated with stylistic or aesthetic pursuits, far removed from the conceptual rigor, functional connections, technical knowledge or representational dexterities that incoming students are expected to comprehend. Yet though idea and sequence, visuals and structure may take the stage, it is through forms that they are investigated; it is forms that can be put on paper or built in models or coded on screens. Forms are the perceptible product of teaching, the readily analyzable lab object, the tool with which we interpret environment, use and materiality. This paper discusses the utilization of formal strategies by the two design studios taught in the first year of the NUP Program in Architecture. The first-semester studio, based on a simplified version of the well-known nine-square grid problem, employs a kit-of parts strategy in order to exploit the tactile materiality of toys and the structural consistency of games. The second-semester studio, narrowing its focus on issues of dwelling, meshes narrative with visualization in order to examine the conventions of everyday spaces in the city and at home. In both, experimenting with form lends itself as a method of developing representational and communication skills, as a technique of understanding and exploring spatial relationships, and as an instrument for questioning the dominant perceptions of 'ordinary' and 'extra-ordinary'. Playing with form offers a means to de-familiarize students with their accustomed ways of learning and with what they expect to learn, and to familiarize them with the seldom linear, often strenuous, but always exciting route of transforming an idea into space.

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1. Beginnings

In an architecture school studio, architectural design is both the medium and the subject of teaching, as opposed to other disciplines, where the subject matter may be approached through lectures, readings, exercises and the occasional quiz. No textbook can provide the information offered in the design studio: "*There seems to be a certain kind of knowledge and understanding that it is very hard to attain in any way other than by actually designing seriously*", Lawson [1] observes. However, in the Greek and Cypriot educational systems, design is a topic that is seldom approached in secondary education, and first-year architecture students only arrive with technical and free-hand drawing skills, which are very specific in scope and outcome.

Architecture and design may be absent from secondary education curricula, yet everyone is exposed to them; mainstream media and city billboards celebrate grand architectural public statements and impressive private abodes, conditioning aspiring architects to enter a world of iconic figures and elaborate amenities. It seems that to teach architecture, one has to upend a series of preconceptions about what architects do and how they do it. Love discusses "*the need to instrumentalize a program of 'forgetting'*" [2], and even as future architects are launched into the already un-familiar conditions of a studio environment, what we, as studio critics usually do, is try to further de-familiarize them with what they already know, dispel their expectations about what they will learn and how they will learn it, and de-stabilize their presumptions about design. Yet a strategy of understanding why and how these icons come to be, of dissecting and 're-membering' (in the sense of re-structuring) relations of forms and functions could provide for a smoother launching sequence, one that may trace architecture into everyday experience and use personal experience to trigger a critical engagement with it.

In order to counteract the students' assumptions about architecture, in the first-year design studios discussions on form tend to be avoided; for those un-initiated in architectural thinking, forms are mostly associated with stylistic or aesthetic pursuits, far removed from the conceptual rigor, functional connections, technical knowledge or representational dexterities that incoming students are expected to comprehend. Yet though idea and sequence, visuals and structure may take priority, it is through forms that they are investigated; it is forms that can be put on paper or built in models or coded on screens. Forms are the perceptible product of teaching, the readily analyzable lab object, the tool with which we interpret environment, use and materiality. Beginning with abstract forms, students can grasp concepts such as scale, order, enclosure, axis and symmetry, and the basics of architectural representation. More complex readings can imbue forms (and their relationships) with a functional content, which may be elaborated into social and cultural information. Moving from the abstract to the specific, this paper traces the rationale of a series of formal strategies applied in the first- and second-semester studios of the Neapolis University Pafos Program in Architecture, as they have evolved over the past decade.

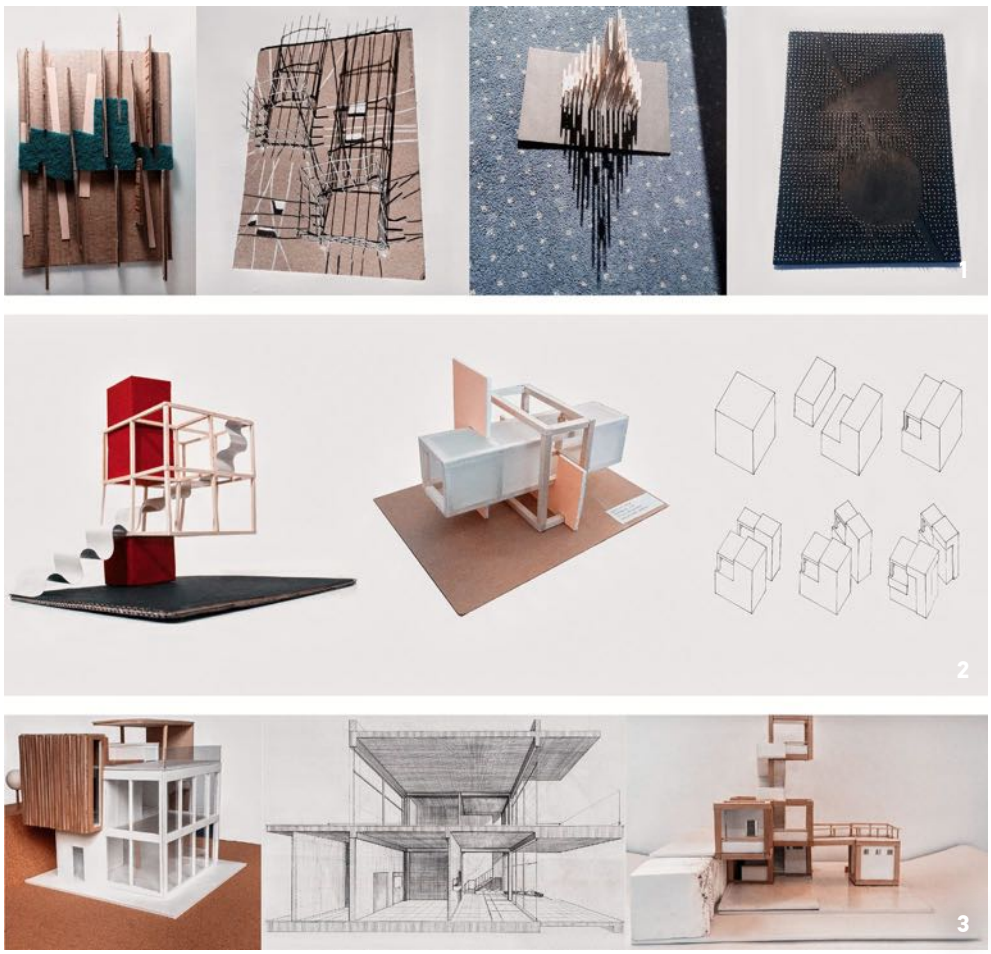


Fig. 1: ARCH AS101_01 (a) D. Mavri, 2017-18; (b) S. Chrysostomou, 2019-20; (c) A. Tsopozidou, 2018-19; (d) C. Kallika, 2019-20.

Fig. 2: ARCH AS101_02 (a) C. Efthymiou, 2014-15; (b) C. Matsa, 2017-18; (c) A. Mazaraki, 2013-14.

Fig. 3: ARCH AS101_03 (a) D. Mavri, 2017-18; (b) P. Ioannou, 2013-14; (c) N. Papasavvas, 2016-17.

2. The Studios

2.1. The First Semester

Course "*ARCH AS101. Fundamentals of Architectural Design: Elements and Forms*" aims to introduce students to comprehending, representing and designing environments, through a discussion of fundamental spatial concepts, structures and organizational patterns. Architectural design is considered as a process that correlates and composes a multitude of often conflicting factors. Teaching is focused on model-building and drawing as means of communication, as techniques of understanding and exploring spatial relationships, and as tools that enhance creative, critical and analytical skills. Students are asked to work on a series of tasks of increasing complexity, in order to be acquainted with key spatial concepts (e.g. boundary, scale, form, function, structure), understand the notion of architectural principles (the 'parti', relationships of composition, movement sequences), and begin to grasp the socio-cultural dimensions of space.

The first task (ARCH AS101_01), tackled within the first couple of weeks, is a 'lesson in anatomy'. Studying images of abstract paintings, the students start to understand the notion of compositional principles; order and hierarchy, transparency and opaqueness, centrality and dispersion, rule and surprise, transition and contrast, enclosure and openness are brought forth as compositional devices, which the students have to consequently employ in their own high-relief models (Fig. 1). The goal of the exercise is not to extrude a two-dimensional composition, nor is it to express a theoretical idea through a sculptural piece. Rather, it is an exercise in concrete abstraction: an exercise where forms are built, arranged and re-arranged in order to clearly manifest the principles -understood as rules- according to which they are composed. The properties of forms -geometry, color, texture, size-, their numbers, their relationships, become tangible, editable objects that the students literally play with. Of course, this is a bizarre play, as the rules of the game are different each time; they do not pre-exist, but they are generated through the play; and they should not restrict, but allow for a variety of formal outcomes. What this exercise also does, not as a clearly stated learning outcome but more as a strongly intended side-effect, is to pull the void out of the margin, to bring it forth as form, to establish its significance in any formal play and to make its hitherto unspoken presence an equal partner to the 'loud' visibility of the solid form. The emergence of the void through the strategic manipulation of the solid form becomes then a revelation for incoming students, most of whom have learned to privilege the compact, the evident, the full.

This is a warm-up task for the first part of the studio project (ARCH AS101_02), a kit-of-parts exercise based on the nine-square grid. This is a well-known design problem developed by J. Hejduk at the University of Texas [3], which stripped design from functional or symbolic issues to the solution of relations between specific elements like walls/planes and axes/lines placed within the spatial rhythm provided by the frame. This artificial 'autonomy' of the architectural object may leave room for criticism [3], yet in the context of an introductory studio it allows for a gradual acquaintance with the multiple dimensions of architectural design. Starting with simple abstract forms, this exercise is grounded on the dialectic

between the initial frame and the elements added to it, and the complexities generated by a series of syntactic manipulations of this dialectic [4].

In the case of *ARCH AS101*, students are asked to transform a four-square grid, in anticipation of the second part of the project. Even so, the grid provides a series of geometric certainties (edges, corners, diagonals and symmetry axes), an 'inside' and an 'outside', a spacing of piers and a basic structural system. Students are encouraged to not only add elements to the grid, but also to repeat it, slice it, turn it on its side (Fig. 2). The grid is seen as an open framework, a field where the relations between elements unfold. The rules that the students explored in the previous task are again brought into discussion. The exercise combines the tactile materiality of model-building with the structural consistency of a game, in order to introduce students to architecture as both a discipline *and* a play.

Once the model is finished, students have to draw it in orthographic, axonometric and perspective projections [5]. The reversal of the expected order between drawing and building helps, firstly, to establish the spatial composition as the desired outcome of architecture, instead of a set of two-dimensional drawings (we must bear in mind that most incoming students have already taken courses in technical drawing, where they are expected to make immaculate *copies* of plans and sections). Secondly, it helps students understand drawing as a language with specific rules that transcribe the three-dimensional onto the planar, re-informing their previous experience as expert copiers. And thirdly, it helps them appreciate representation as yet another layer that can be manipulated to explore and communicate spatial ideas.

What seems to be missing from this abstraction is content; the notion of architecture not only as a challenge in formal configuration, but also as a physical and cultural operation that deals with the concrete specificities of time, program and context. This is what the second part of the studio project does (ARCH AS101_03). Students are asked to transform their composition into a seaside café, using the drawings and the models they have already developed as a basis of departure (Fig. 3). Before this final exercise, students have studied the space of a café, in groups, as an interim task. This is in order to understand, first-hand, the physical dimensions of objects and of their arrangements, the anthropometric necessities of a specific use and the spatial negotiations between functions. Again, this exercise takes a familiar everyday environment and asks the students to dissect it and see it anew, to try to understand the spatial devices that organize movement and symbolism, light and context through sketches, photographs and diagrams. They can apply this knowledge in the design of the café, as they begin to transform their last model into a functional space. Another reversal takes place here: function follows form, as the goal of the exercise is to accommodate a rather openly set program and a very demanding context –a near-by beach- without compromising the main compositional features of the four-square-grid exercise. Each student is encouraged to develop their own café program, taking into account the particular features of the spaces they have developed in the previous part of the studio. Forms, therewith, and their arrangements, become imbued with content, with a variety of meanings that become clearer and increasingly corporeal in the course of each project.

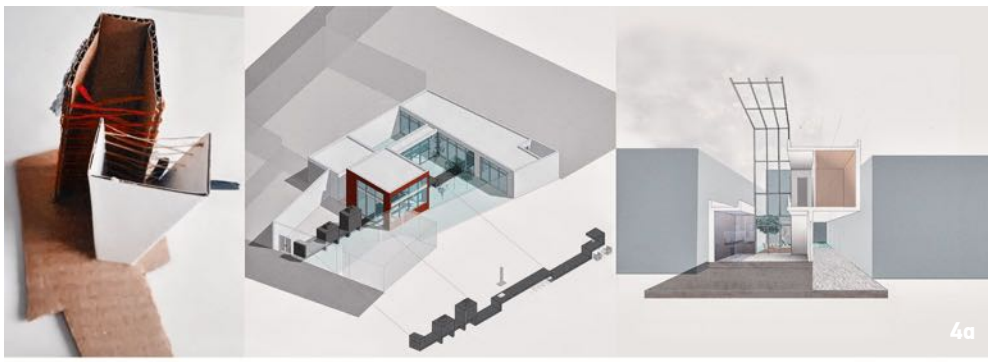
2.2. The Second Semester

Designing a house may be one of the tasks most frequently faced by architects, yet by no means is it an easy one. To tackle it, an architect has to consider issues of personal preferences and socio-economic conditions, cultural structures and psychological relations, ergonomic and environmental factors. The aim of the course "*ARCH AS102. Fundamentals of Architectural Design: The Dwelling*" is to acquaint the students with the concept of dwelling through a project directly related to issues of materiality and lived space. The second-semester studio narrows its focus and meshes narrative with visualization in order to examine the conventions of everyday spaces in the city and at home. In this semester, the scope of the studio is to explore Goel & Pirolli's idea of design as a construction of "*models of possible states of affairs*" [6], as a field of potentialities through which every designer navigates according to a specific set of criteria and assumptions, in order to narrow down the practically limitless possibilities. Therefore, the design process is as important as the end-of-semester result. Drawings, diagrams and models are explored as analytical tools and as compositional and representational devices.

The theme of the studio is the design of a home for one person, with an affiliation that incites multiple readings and contains qualities with spatial extensions. The syllabus offers a list of suggestions, but the students may come up with their own 'dweller': an acrobat, a poet, a collector, a dancer, a traceur, a carpenter, a cook, just to name a few. Keywords are also suggested, mapped unto the dwellers as themes that can be explored and transferred into space: balance, memory, order, rhythm, danger, structure, ritual, etc. Students are asked to choose a dweller, study the associated qualities and carry them into space, through drawings, diagrams, collages and models. The literal shapes of the beginning (e.g. a home for an astronaut shaped like a rocket, or a home for a storyteller that looks like a book) gradually change into arrangements of relationships and spatial forms that carry social content (e.g. a series of suspended spaces to evoke weightlessness, or a labyrinthine entry sequence), which are then further transformed as the parti develops into a spatial composition (Fig. 4a, 4b).

In contrast to the theoretical nature of the project brief, an actual plot is given. For the conventions of the Cypriot city, it is unconventional, but it is real, and it grounds what could be a very abstract project onto an urban context. It is an inner-city site in Ktima, on one of the recently pedestrianized streets in the historic center of Pafos. It has a rather narrow street front, which opens up to a wider trapezoid within the block, surrounded by small-scale commercial buildings, cafés and apartments. The site becomes an opportunity to discuss matters of scale, use, relationships between public and private space, circulation, orientation, density. Its limited frontage diverts attention from the elevation and issues of style to the section as a tool for spatial exploration and creativity.

The friction between the fictional dweller and the actual plot makes narrative an essential agent in this studio; by choosing an unconventional dweller, students have to construct not only a dwelling, but a model of dwelling quite removed from their own everyday lives. Rather than dismissing the quotidian, however, the discussions in studio aim to highlight its value as an agent of personal and collective development, as meaningful difference and as a source



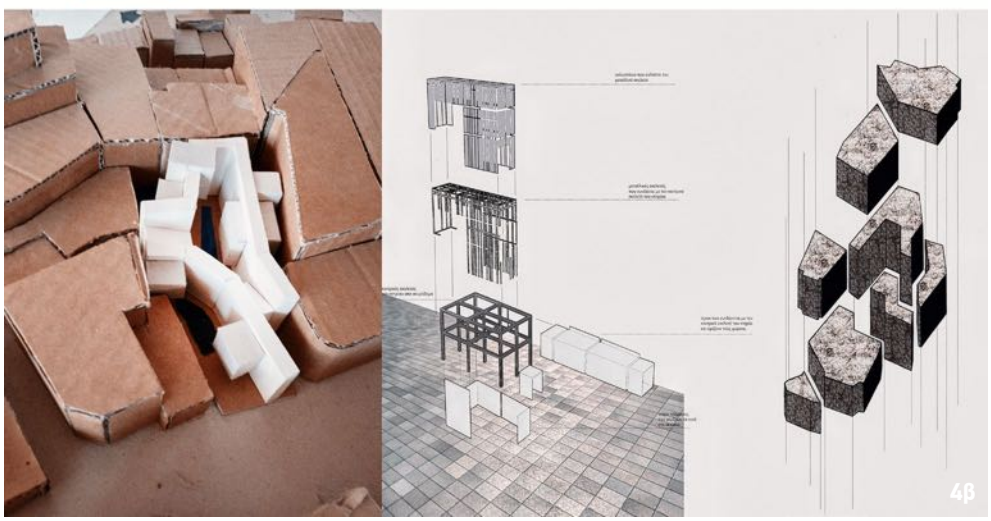


Fig. 4a: ARCH AS102 (a) E. Eliades, 2016-17, House for two acrobats; (b) C. Matsa, 2017-18, House for a cook; (c) K. Economou, 2014-15, House for a gardener.

Fig. 4b: ARCH AS102 (a) D. Mavri, 2017-18, House for a graffiti artist; (b) A. Spanos, 2013-14, House for a lawyer; (c) A. Anthimou, 2013-14, House for three bachelors.

of richness, 'magic' and revolution. The hyperbole of the studio subject makes it easier to introduce the concept of the 'promenade architecturale' as a spatial and temporal sequence and to understand program not as a series of predefined spaces and relationships but as a flexible structure that leaves room -literally and figuratively- for the unexpected.

3. A year-long process

The two first-year studios have been presented separately, but they form a continuous process to introduce students to the seldom linear, often strenuous but always exciting route of transforming an idea into space. The abstract forms and design principles of the first exercise find further application in the playful structuralism of the four-square-grid and acquire functional and cultural features through the metamorphosis of the grid into a café. The dwelling project introduces narrative and a critical awareness of everyday habits and exceptions. The emphasis given on hand-drawing and 'cardboard' modelling during the first semester is sustained in the second and integrated with digital tools, in order to encourage students in visual experimentations and design explorations. Drawing and making become the modes of understanding and thinking design problems through, and are exploited to stimulate creativity, to promote critical thinking, and to reconsider the norm. At the same time, architecture is discussed not as a stylistic pursuit, but as a rigorous discipline constantly engaged with the world around it; future architects are expected to ask questions, experiment, configure models of spaces and of relationships of spaces and of potential futures- and have fun doing this.

The sequence of the two studios is articulated with other modules in the structure of the curriculum. Within this context, the first-year studio is regarded as a component which develops along and in dialogue with other modules, so that students grasp architectural design as a composition of multiple factors and fields of knowledge. As already mentioned, modules in spatial visualization apply drawing and modelling techniques to the studio project [5]. The second-semester dwelling also has an after-life in a third-semester technology studio [7], which extends design development through an exploration of construction methods, highlighting the continuously transforming nature of an architectural project. This extension is helpful in establishing a process- rather than a result-oriented approach in design education; instead of expecting a conclusive answer to the design problem and agonizing over a pre-conceived end result, first-year students are encouraged to experiment with the unknown, learn from dead-ends, and embrace the uncertain.

Forms become a valuable ally in this quest, as they offer a basis of familiarity, a group of tangible, readily analyzable objects that can be reductive and conceptual yet full of content when it comes to discussions on structure, construction, use, socio-cultural meanings and symbolism. They are known entities in a new and strange environment, where answers are not given as definitive statements but as a series of further, deeper probes. Forms can be constructed, observed, analyzed, taken apart and put together again, arrayed, clustered, piled, scattered, sliced, split, bent, crushed, pierced; in short, they can be subjected to numerous operations. But they are not just passive objects. As boundaries, they give shape

and structure -form- to 'empty' space, and render it as graspable, legible, important and worthy of discussion as any physical figure.

Acknowledgements

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[2] T. Love, 'Kit-of-Parts Conceptualism: Abstracting Architecture in the American Academy', Harvard Design Magazine, no. 19, 2003.

[3] For a history of its development, see A. Caragonne, The Texas Rangers: notes from an architectural underground. Cambridge, Mass: MIT Press, 1995.

[4] U. Franzen, A. Pérez Gómez, and K. Shkapich, Eds., Education of an architect: a point of view, the Cooper Union School of Art & Architecture. New York: Monacelli Press, 1999.

[5] The ***ARCH AS101*** models provide the literal models that students draw in course ***ARCH SV101. SPATIAL VISUALIZATION 1: Architectural Drawing***, to develop their visual representation skills (taught by A. Sivitanidou & E. Dova). My colleague and I have found this osmosis between courses useful in overcoming the curriculum-imposed break-up of the architectural project into discrete modules. Later, module ***ARCH SV104 SPATIAL VISUALIZATION 4: Spatial Transformations*** (taught by A. Sivitanidou) explores the idea of the parti further through models, and ***ARCH SV105 SPATIAL VISUALIZATION 5: Digital Means*** (taught by J. Bellos) introduces digital skills by applying them on the students' studio projects.

[6] V. Goel and P. Pirolli, 'The structure of Design Problem Spaces', Cognitive Science, vol. 16, no. 3, Jul. 1992, pp. 395–429.

[7] This is module ***ARCH TS201. TECHNOLOGY STUDIO 1: Construction Systems***, taught by visiting prof. D. Antoniou.

Teaching the Fundamentals of Architectural Synthesis, Before a Design Studio Module that Uses Computational Design Thinking

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Abstract

This paper discusses a teaching method as a very "first contact" with architectural synthesis, prior to using any digital design tool / software. Instead, the most fundamental tool to design architecture is used: physical modelling. This approach was applied in the first year of architectural studies in a UK university, over a period of three weeks. Each student was given an already made, small physical model, named Pet Space, over their first week of their studies. Each physical model was made by the author and has a unique design language and specific architectural qualities, through the architectural elements used, such as walls and floors and ceilings. Week 1 started with a lecture, followed by one to one and group tutorials, where each Pet Space was explained and discussed with the students. Students were introduced to a number of basic architectural terms, elements and ideas we can use to organise space, based on the proportions, dimensions and position (layout) of the architectural elements used. After that, the same Pet Space was used to introduce students to graphic representation; students had to draw orthographic drawings, journey diagrams, perspectives and axonometrics for their own Pet Space. These are documented in the paper. Week 2 and 3 were about experimenting for the first time with composing architectural space. Students had to extend the initial Pet Space, while following the main design principles used for the initial physical model. Other than making a physical model that complemented (or contradicted) their Pet Space, students had again to produce drawings and sketches of their extension proposal. Again, these are documented in the paper. The documented and discussed results demonstrate how students progressed in understanding and acquiring some basic design skills, over a short period of three weeks, as an introduction to Architectural Synthesis. At the same time, the method can act as a base for a future introduction to Computational Design Thinking.

1. Introduction / literature review

Teaching design studios in the first year of architectural studies has being part of the pedagogical discourse for many years now. Nowadays, students and tutors are exposed to a plethora of visual stimuli online, with an endless inflow, which technology has imposed in every part of our lives. Within this torrent of online images, it becomes quite hard to stimulate further interest in "How" a project is composed, to any student or designer.

Architectural Synthesis, an often pain-stacking process, is rarely communicated through the lushly illustrated photographs of a project. Yet Synthesis, is maybe the most important skill one should master in Architectural Design, along with the anthropological / social aspect of a project.

At the same time, digital design tools are actually changing the way we design architecture, even if we never choose to use any software. Students get exposed to digital software on their own, even if that software is not part of a design studio curriculum. The outcome is that students end up using software as mere representational tool (Computerisation as Terzidis (2006) named it) and not as tools for architectural composition (Computation).

Thus, the second "problem" this paper is trying to address, is How to prepare the ground for a Computational Design approach, without compromising -or neglecting- the basic architectural design skills that architecture students must acquire quite fast in their first weeks of their studies. This paper is part of an on-going research on Computational Design Thinking and its possible applications within a design studio; Vamvakidis (2016, 2018).

A seminal book on Architectural Synthesis is named Form, Space, and Order (Ching, 2007). It has been the classic introduction to the basic vocabulary of architectural design for many years now. The latest edition features expanded sections on circulation, light, views, and site context, along with new considerations of environmental factors, building codes, and contemporary examples of form, space, and order. This classic visual reference helps both students and practicing architects understand the basic vocabulary of architectural design by examining how form and space are ordered in the built environment. This paper aims to add to Ching's visual approach (which is illustrated with sketches), by adding maybe the most important tool in architectural design, as part of the pedagogical approach of teaching architectural design; namely, physical modelling.

The method proposed in this paper is also more concise than Ching's book and is directly applied in teaching design studios from the first day of architectural studies, over a specific time frame of three weeks.

In parallel to physical modelling, this paper uses another tool that became part of the Architectural Synthesis due to architects such as Eisenman (1999) and Lynn (1999); the diagram.

To put it simply, the diagram is an abstract, yet clear way to communicate architectural / spatial relationships and qualities of a project. The diagram is also a tool to map / document the design process. This approach can be quite useful for architecture students, since it can offer them the chance to document their design process, advancement from initial idea to

final proposal (as well as their tests and failures), and eventually reflect on the design choices they made. A sketch, a physical or digital model can be the background for a diagram. The diagram was initially used by offices such as Eisenman, Lynn, Tschumi and OMA, and has now become a globally used design tool.

A pedagogical approach that focuses on the use of the diagram is discussed by Maldonado (2014) in Digital Recipes: A Diagrammatic Approach to Digital Design Methodologies in Undergraduate Architecture studios. This paper differs from this example, as it is focusing at even an earlier stage of architecture studies, the first year; and it requires no prior knowledge of architecture or digital design tools. Maybe the most important aim of the design method proposed here, is that it could act an introduction to Architectural Synthesis, even if someone never chooses to use any design software.

The proposed method aims to introduce students to Architectural Synthesis, while preparing students for a Computational Design Thinking studio, after the first three weeks of their studies. This paper focuses only on workshops that took place these first three weeks.

Other than Computation Terzidis (2006), The method discussed in this paper also aligns with Pask (1969) and the Cybernetics theory; especially the needed mapping of any steps in a design process, as well as adding feedback in a process that is cyclical, as the systems theory by Wiener (1969) proposed.

2. Organising Space - the method

As mentioned above, in order to avoid compromising -or neglecting- the basic architectural design skills that first-year students must acquire, maybethe most fundamental element someone can use to design architecture- physical modelling- was used as the main tool for the proposed design method. No software or digital tools were used during the first weeks of their studies. Each student was given an already made, small physical model, named Pet Space, over their first week of their studies. The scale of the model was 1:100, so that the students could easily measure it, even without a scale ruler. Each physical model was made by the author and has a unique design language and specific architectural qualities, through the architectural elements used, such as walls and floors and ceilings.

The timetable included two Design Studio days per week. Each studio day lasted six hours, with an one-hour lecture at the beginning of each day, followed by workshops and one to one and group tutorials. The method was applied for the main design studio module, to a cohort of 40 students, at an Interior Design course in a UK university.

2.1. Week 1 - Basic Architectural notions / elements

Week 1 started with a lecture, followed by one to one and group tutorials, where each Pet Space was explained and discussed with the students. Students were introduced to a number of basic architectural terms, elements and ideas we can use to organise space, based on the proportions, dimensions and position (layout) of the architectural elements we use, any space we design can be broken down into different zones and areas, creating corridors and

circulation areas, collective spaces, more private zones and rooms (Fig.1). For example, one of the Pet Spaces had a larger space as a main feature, allowing for larger numbers of people, acting as collective space. The lecture explained how ceilings, walls, floors, stairs and ramps can be used to guide people towards the collective spaces of a design (Fig. 2).

Another element / architectural tool that was explained during the lecture while using another Pet Space physical model, is the grid. The lecture explained how a grid is may be the most common way to organise space in smaller or larger increments. The grid can have any geometry, from (the most common) rectangular to square or diagonal, only to name a few. It was also discussed how it can be quite helpful to use a grid in order to place our structural elements such a columns and load-bearing walls. All architectural elements such as walls, floors and ceilings can follow the grid geometry in order to create smaller zones. Elements that do not follow the grid and are placed diagonally become more visible within the space we design. Students were explained how using a grid is there to help us compose, but it should not limit our design; we can always choose to neglect it for a part of our building (Fig. 3).

After the first lecture and one to one tutorials, on the second studio day of Week 1, the same Pet Space was used as a basis physical model, in order to introduce students to graphic representation. A lecture on this subject was followed by a workshop and one to one tutorials on how to draw by hand (and a bit of graphic software) the below for their own Pet Space:

- Sketches / Perspectives (Eye level and bird's eye views)
- Orthographic drawings (plans, sections, elevations)
- Journey diagrams (showing the different paths someone could follow in their Pet Space)
- Axonometric drawings

2.2. Week 2 & 3 - Composing Space

Week 1 was about understanding some basic architectural ideas / concepts on ways of organising Space, as well as experimenting with producing orthographic and perspective drawings. In the next two weeks, students were asked to make a space of their own for the very first time. The space they had to make would be an extension to their initial Pet Space. The scale of the extension physical model was again 1:100.

During week 2, students were asked to work in couples, while sharing any of the initial Pet Space they chose. Their task was for each student to make an extension, for the Pet Space they shared. This was done in order to promote collaboration between students. The Pet Space extension could follow the design language of the initial physical model, or neglect / contradict it. Any option could work, as long as the design elements / choices were related / referenced the design elements of the initial physical model. The first day of the design studio was about experimenting with different ideas and the second day was about making a final physical model of the Pet Space extension.

Week 3 was about producing drawings of their Pet Space extension. Students also had to document and with numbered diagrams and photographs of the physical models, the design

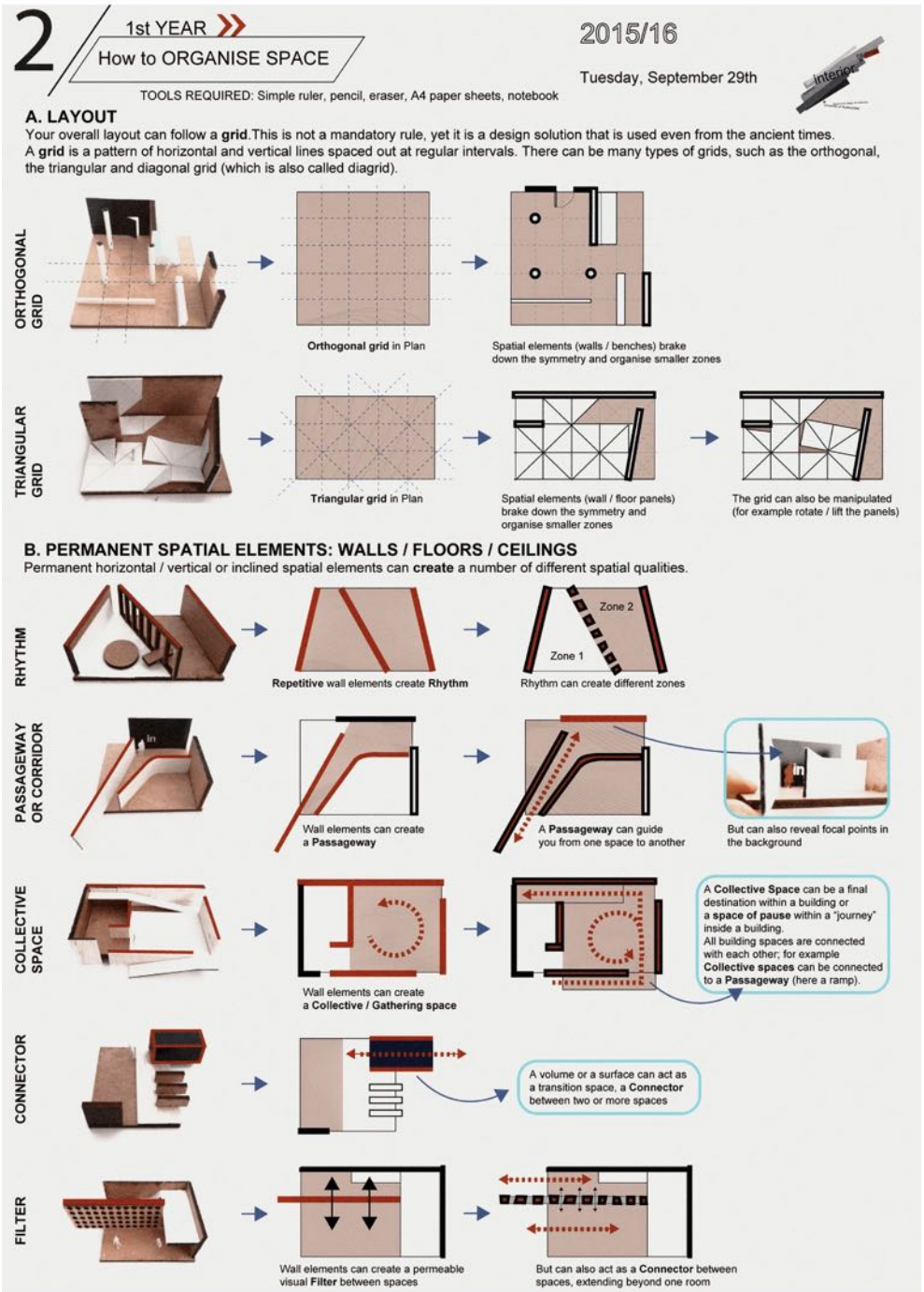


Fig. 1: Hand-out for Week 1: "How to Organise Space"

steps they followed, during their design process. This way, the instructions of their form-finding process were included in the process itself, as Menges (2011) proposes. The first day of the week started with a lecture on the tasks, which was followed by a drawing workshop and group tutorials. The workshop was about drawing the drawings mentioned above. The second studio day of the week was focusing on tutorials on the Pet Space extension drawings each student had produced.

3. Results

3.1. Results of Week 1

Each student used his own Pet Space to produce sketches / perspectives (Eye level and bird's eye views), Orthographic drawings (plans, sections, elevations), Journey diagrams (showing the different paths someone could follow in their Pet Space) and finally axonometric drawings.

Also, students had to sketch the buildings they visited during that week, as well as their Pet Spaces from different view angles, while exploring different graphic styles. This included very quick 2' sketches, left-hand sketches and more detailed, 15' sketches.

3.2. Results of Week 2 & 3

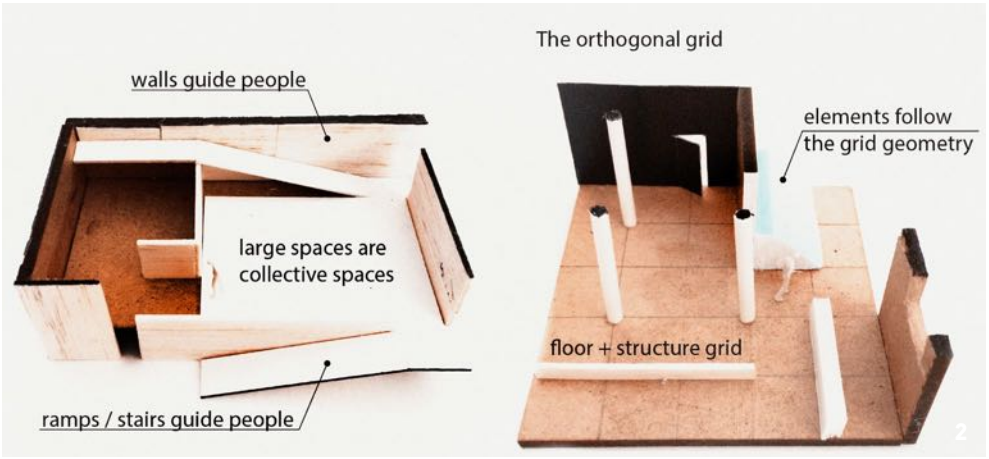
The results of week 2 were physical model extensions in a scale of 1:100, while using the same or different materials, as the initial Pet Space physical model. Students had the chance to produce a number of test physical models that showed the steps they followed in their process. This gave them the chance to document each step they followed, allowing them to go back to any previous step of their process, and iterate their design. This allowed including the needed mapping of any steps in a design process, as well as adding feedback in a process that is cyclical, as the systems theory by Wiener (1969) proposed. They also produced final physical models (Fig. 4). They had the chance to discuss with their peers in group tutorials the extension physical model each student made.

The results of week 3 were the drawings and numbered design process steps mentioned above, this time for their own Pet Space extension physical model. Again, students had to sketch the buildings they visited during week 3, as well as their Pet Space extensions, while exploring different graphic styles (Fig. 5).

4. Evaluation / conclusions

The documented and discussed results demonstrate how students progressed in understanding and acquiring some fundamental design skills, over a short period of three weeks, as an introduction to architectural synthesis.

Students managed to tackle the design studio workshops with success, and were quite enthusiastic during the tutorials and group discussions. At the end of the workshops, students were asked to fill in an anonymous student survey, which showed that that 100% of



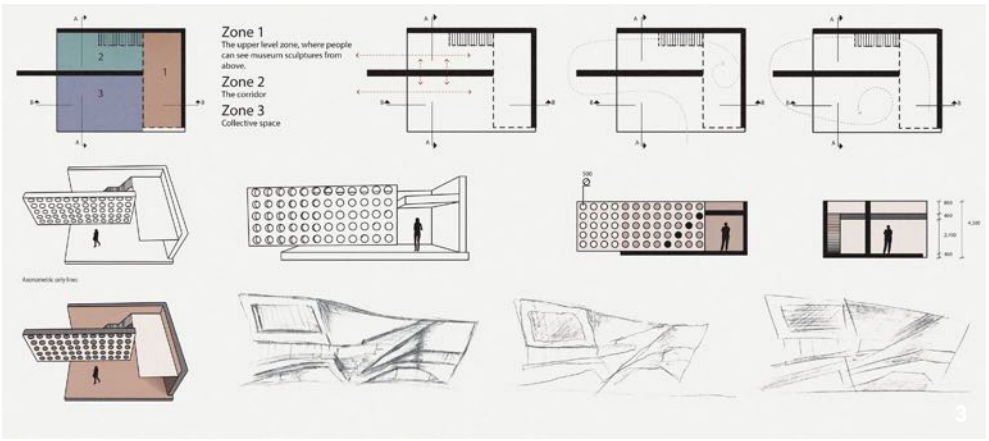


Fig. 2: Initial Pet Space physical models were given to each student during Week 1.

Fig. 3: Results of Week 1.

the students found that the workshops (combined with theory and precedents lectures) had improved their knowledge and understanding of the subject. It is noted that students had the same amount of tutoring and design studio contact hours, as our university has had for first-year students in previous years. Students were marked / moderated by all design tutors and marks were finally moderated by external examiners which the author did not previously know. Looking at the student marking statistics at the end of first year, the A marks did rise 50% compared to the previous year. All of the aboveindicate a positive outcome on the proposed design method.

5. Future research / next steps

Digital design tools are actually changing the way we design architecture, even if we never choose to use any software. The next step could be an initial design approach towards Computational Design Thinking for first-year architecture students, without the use of any parametric software. It would be again a method based on physical modeling. The next step of this research could investigate some of the main theoretical points of a Design Thinking approach and then propose a design method that refers to digital design tools / software we use as architects, introducing ways to manipulate physical form, almost the same way that digital design software manipulates digital models. The below key points will be taken from the Digital Design theory, which could then be used as design studio guidelines:

- Mapping of any steps in a design process.
- Adding feedback in a process that is cyclical.
- Using transformations in order to manipulate space.
- Using the diagram in order to map the design process.
- Including the instructions of the process itself.
- Creating a CAD - CAM convergence.

Acknowledgements

I would like to thank all the first-year students at Huddersfield University, UK for their contribution with their projects. I would also like to thank the fellow studio tutors Penny Sykes, Joanne Pigott-Hakim and Paul Blindell for their contribution and support throughout the design studio workshops, lectures and tutorials.

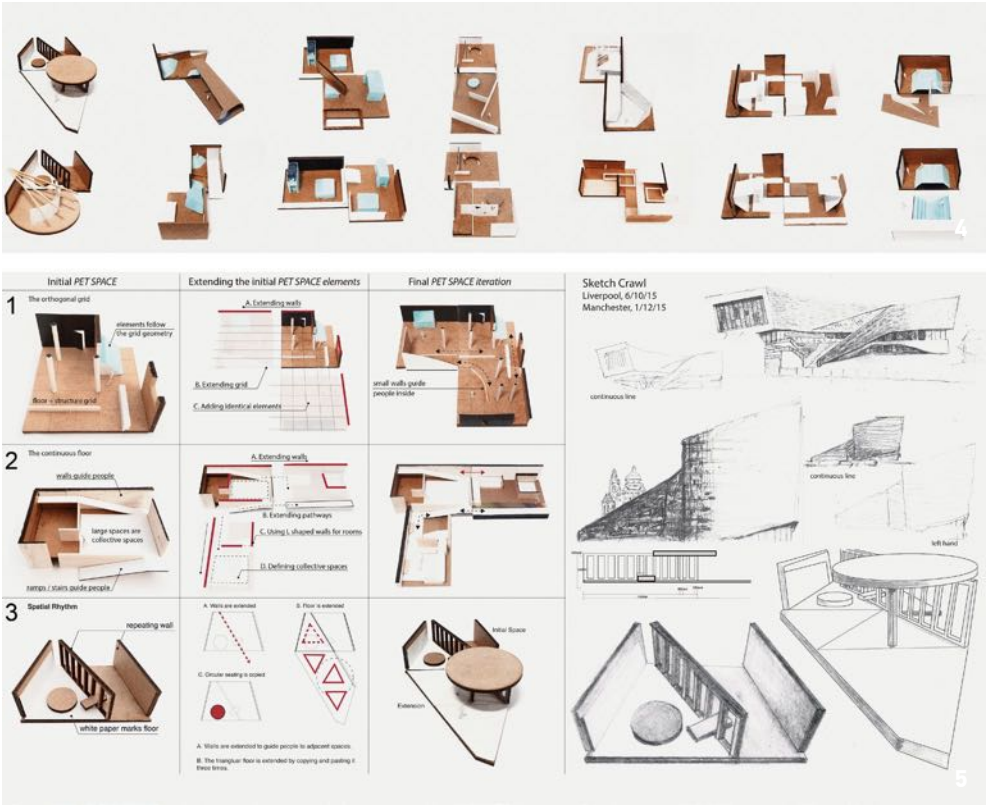


Fig. 4: Results of Week 2. Student model extensions next to the initial Pet Space physical model.
Fig. 5: Results of Week 3.

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Urban Context & the Event

Urban Glenti

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Abstract

The 'Urban Glenti' (feast) is the thematic for the first semester, first year of the Architecture Department of the University of Nicosia since 2014. The course introduces students to the notion of critical spatial interpretation through the exploration of a number of "ways of seeing". It is seen as the arena of immersion into architecture, which is driven by social issues, environmental concern, and theoretical backbone. Inventiveness and imagination are cultivated through a series of short design projects The architectural explorations took place through one of the very essential human activities, the 'event' of eating. They gradually added layers of more complexed inter-relationships: 'a supper with me', a supper with me and you' and 'not the last supper' that led to the final proposal of the 'Urban glenti' (feast). The students were asked to increase their personal ability of the 'ways of seeing' and to look beyond the visible into the unseen. They mapped and creatively and critically responded to the relationships of the elements, the systems, the spatial qualities, the parallel actions and the environment of the act of eating. Finally, they were asked to propose a new urban way of living through the urban feast. Parallel to the architectural media of representation as the drawings, models, sketches, collages and videos the students were asked to map a relevant workshop with a choreographer, to write haikus and the continuation of the 'invisible cities' in order to distill their observations and enhance their imagination. Real Urban installations, meetings with anthropologists and other interdisciplinary events increased the engaging of the social issues in their educational environment. In the process of the project, other essential human activities- the working, resting and acting were introduced, in order to raise their awareness of the relationships of the human with the system of objects and its environment.

1. Introduction to the 'Urban Glenti' (feast)

The 'Urban Glenti' (feast) understands built environment as the blending of the Architectural and the Urban realms [1], where the humans have a right to the city and a right to the Joy [2]. It also refers to the lost rituals of the glenti/ feast during the wedding ceremonies and the eastern time in Cyprus [3], where people cooked, ate and celebrated together, appropriating streets and squares with furniture and items from their houses. Since 2014, the thematic is chosen for triggering the architectural thinking through joyful –and not only- sensory and corporeal experience for the students of the first semester, first year of the Architecture Department of the University of Nicosia. The specific teaching methodology aspires to introduce the students to the notion of critical spatial interpretation through their engagement in everyday activities. It facilitates an academic and experiential environment where the exploration of a number of "ways of seeing" [4] becomes its driving force. This educational arena of immersion into architecture, driven by social and environmental concerns, theoretical backbone and interdisciplinary identity aims at breaking the preconceptions and the conventional notions of what architecture might be; especially today, bringing to students' awareness the (almost) ruthless aggravation of social and environmental conditions. At the same time, striving for inventiveness, cultivating ideas, exploring imagination and nurturing curiosity in corporation with inspiring research of the state of the arts technological and theoretical advancements filters all the given assignments. They are orchestrated through a series of short design projects.

One of the very essential human activities, the 'event' of eating is used as the primary architectural exploration. 'A supper with me' project asks the students to perform the act of eating by themselves alone in order to start paying attention on their immediate environment. 'A supper with me and you' and 'not the last supper' projects gradually add layers of more complexed inter-relationships. The three small projects introduced the students to the multilayered aspect of architecture. The students are asked to increase their personal ability of the 'ways of seeing', to understand and interpret events/objects/ places, looking beyond the visible and the obvious into the unseen, to relate spaces to human needs and scale, to discuss immaterial notions and transform them into a design language and a haptic creation. The personal way of seeing and the forging of each student's identity will be enforced by integrating your own intuition into methodological explorations. They mapped and creatively and critically responded to the relationships of the elements, the systems, the spatial qualities, the parallel actions and the environment of the act of eating.

While preparing the students with progressive increase of the complexity of interrelationships, helping them to develop personal interpretation, confidence and critical capacity by challenging their existing preconceptions, the initial assignments smoothly lead to the final project; the 'Urban glenti' (feast) requires from the students to propose a new urban way of living through the urban feast.

2. Structure of the classes

The nature of the classes keeps a vibrant rhythm with diverse sets of activities that keep the students alert and expose them constantly to different experiences. The activities and the projects built up gradually the complexity of the requirements and progressively help the students to gain architectural understanding and necessary skills.

The participation of various collaborators throughout the years infiltrated the development of the course in various ways, contributing to the enhancement of its culture: Margarita Danou, Natasa Christou, Angela Petrou, Alessandra Swiny, Petros Lapithis and student assistants Penelope Vazquez Hadjilyra, Evdokia Demetriou, Afra Omidi, George Kartsakas, Christos Xenofontos, Haris Lazarides.

The introductions gain a playful and joyful games character that trigger the interest of each individual students. The games have a structure of activities that relate to the space and facilitate the right environment to talk about Space.

The dance workshop (Fig. 1), usually held at the second class by Dara Milovanevic, the director of the Dance programme of the university, pleasantly but also intriguingly facilitates the breaking with the attachments to certain ways of the relationship of the body to the space, its surfaces and furniture. It enables the understanding of the notion of time, the sequences, the rhythms, the pauses, the balances, the structural systems of the body and the system of bodies in the space.

3. Projects

3.1. 'A supper with me' (Fig. 2)

'A supper with me' first project aims at the relative understanding of our immediate environment, with an emphasis on the human body and the various relationships creating by one activity of our body. Every student had to meticulously document the act of eating in its immediate environment. Students were asked to examine this generally 'deemed' insignificant event by recognizing that eating is a personal behavior which differs from person to person.

The project of 'acting, working, resting and sleeping' was tested as the first project in order to offer opportunity to the students to open their analytical observations into the spheres of the rest of the essential everyday human activities.

3.2. 'A supper with me and you' (Fig. 3)

'A supper with me and you' following project increased the level of observation by adding the presence of one more 'player', the 'other' in the scene of the act. The interrelationships now are expanding as the interaction of two persons reveals new qualities and complexities.

3.3. 'Not the last supper' (Fig. 4)

The 'not the last supper' project asks the students to create a group of 4-5 people to 'celebrate' the act of eating. The energy of the social interaction urges each student to immerse into new observations and understanding of the built environment, and deal with the space and an event [5,6].

3.4. Structure of the projects

The students are asked to explore the relationships of the human with the system of objects and its environment

The 'beds, sofas, hammocks, benches' (or other elements for sleeping/ resting) the 'offices, working places, studios, stages' (or other elements for working/acting) and 'tables, bars, picnic sites' (or other elements for eating) may be considered as a tabula rasa, where human activities / events may occur. They are expected to talk of the order and the systematic arrangements of things (arranged sleeping place, neat desk, dinner table) which may end to the disorder and the unexpected (after the 'party' scene). They we encouraged to discuss the notion of the multi-layered relationships especially of the built and the unbuilt environment. They are asked to argue that built objects are not static objects and deal with the understanding that 'a building is not an end itself; it frames, articulates, restructures, gives significance, relates, separates and unites, facilitates and prohibits. Consequently, elements of an architectural experience seem to have a verb form rather than being nouns' [7].

The gradual increase in number of the students involved in each project offered an opportunity of dealing with individual and group of two or more students projects, accentuating the significance of working in small big groups and alone.

For all three assignments the students had to meticulously document the act of eating in its immediate environment

- before placing themselves in it
- as soon as they place themselves in it
- during the various stages of the act of eating
- after they get out of the scene.

The documentation was initially done with a series of pictures as 4 sequences related to elevation, side elevation of at least 10 pictures for each sequence. The sequences of pictures should be taken using always a stable position of the camera.

- from above in order to generate a representational plan of the whole setting
- from the side as a side elevation
- from the front as the front elevation
- from the back as the rear elevation
- from various angles

Fig. 1: Dance workshop with Dara Milovanovic. 2018 and 2019

These relationships introduce the students to the representations of physical elements into drawings, the understanding of scales, plans elevations, materiality, and the relationship in general of the matter towards the small events, of the material to the immaterial. and the environments it takes place.

- The students were encouraged to use some of the following processes:
- Mere outlines of the main elements
- Relationship of the mass of the major elements (herself/ himself, table, surrounding elements) or small elements (plates, glass, food, utensils etc.) or both of them
- Relationship of the above with the immediate surrounding
- Recognize the relationships of the masses and voids
- Trace the various axis of the elements of the place and of her/ his body, identifying the variety of the bodily axis (hands, feet, body) and the axis of the senses' (viewing, hearing, touching, smelling and tasting)
- Find the various systems and orders that exist or do not exist or change or vanish. Focus on the changes taken place in the act of eating
- Find the relationships of the systems of things in relation to their temporality in the space.
- Trace the light or sound or smell conditions focusing on the atmospheres they create
- Examine the traces of the various items, especially of the ones that move around or vanish
- Recognize the textures, identify soft and hard materials, pay attention on the levels of transparency, trace the movements, map the visibilities, and document the gravitations…
- Discover other notions derivatives from the explorations, especially notions that do not stem out from the actual act of eating

Through the various investigations, the students inevitably delved with various notions:

- borders and porosities, territories, fluidities and flux situations
- flexibilities, temporalities, and permanence
- in and out, light and darkness, mass and void, public and private,
- materiality and immateriality and their interrelationships
- atmospheres and environments, spatial and poetic structure
- continuities- disruptions- recesses
- closed and open spaces and in between
- traces and remains of activities and materials
- rhythms and sequences, order and disorder and accidental events
- social and cultural topography

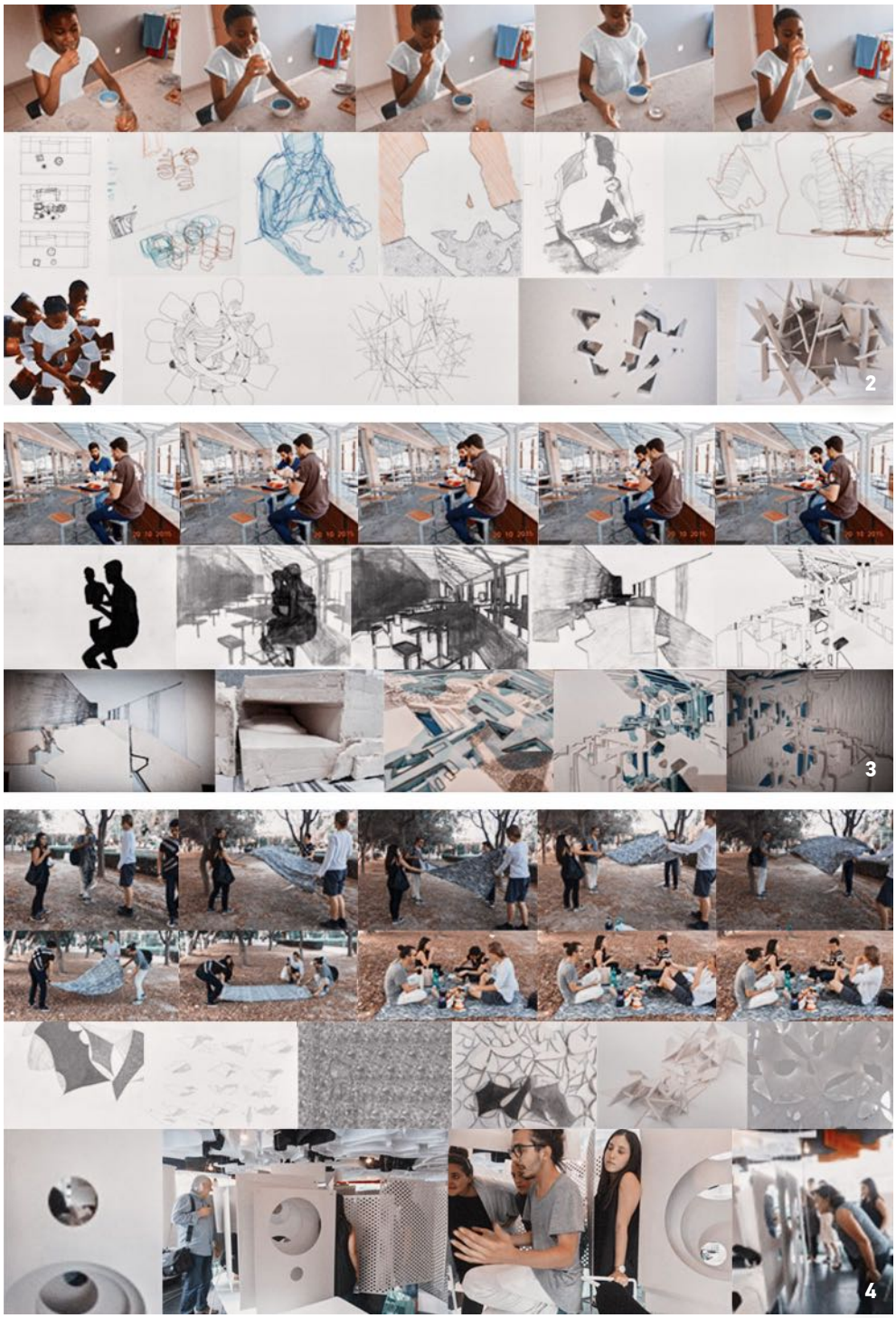

Fig. 2: 'A supper with me' by Alexina Y Larue. 2015

Fig. 3: 'A supper with me and you' by Elias Georgiou and Alexandros Kalogeropoulos. 2015

Fig. 4: 'Not the last supper' by Lukas Stocker in collaboration with Antonis Peratikos, Savoula Papadaki and Ahmed El Dakroury. 2016

4. Installations (Fig. 5)

The third 'not the last supper' project culminated with an actual installation in the real urban world. The vibrant Sushila restaurant setting was offered to create the students' first installation that can be used by the real clients that haunt the urban vibes of the city of Nicosia. Social awareness, the power of their observations and theoretical thinking and the impact of their design approach were tested.

The students' engagement with the 'Buffer Fringe performing Arts Festival of the Home of Cooperation 2019 (curator: Ellada Evangelou) further increased the students' understanding of the political character of materiality and design approach; they dealt with recycling and upcycling methods for bringing diverse groups of people together in various meaningful but also festive ways.

5. Final project 'The urban glenti'/ 'feast' (Fig. 6)

Initially The site of the project was the municipal market of Nicosia, seen as an urban space where the official function of the 'market' is expected to be reinterpreted. The students are asked to envision this urban space merged with a potential urban park/ garden, where the market can be the starting point for new urban activities as the glenti/ the feast. Through the 'glenti', each student is expected to propose a new way of living in this individual project. Eating and drinking or fasting, entertaining or being entertained, socializing or be isolated, working or resting, sleeping or doing sports, doing parkour or going around with wheel chairs were discussed and investigated.

Three different plots in Kaimakli, a traditional neighborhood at the edge of Nicosia, along the Buffer Zone served as the sites from 2018. They are related to a hybrid context of the area combining living, commercial, social and many other issues that are related to the contemporary urban scape. The 'Urban Glenti' in Kaimakli is experienced in the form of a wedding or eastern celebration [3] and through the Pame Kaimakli festivals [8]. At the same time, the overburdened character of the site, as the two Kaimakli, the Buyuk (big) and the Kuchuk (small) Kaimaklis are severed by the Buffer Zone [9] is filled with additional demographic, financial and social forms of Crises; immigrants and other diverse groups of people are attracted and join the remaining older generation of its inhabitants. The nature of the course encourages the students to take in advantage the negative characteristics of the Crises in order to invent better Living conditions [10,11,12].

An emerging built environment focusing on social and environmental concerns is expected to be embedded in the student's proposal. Living as living across the edges or along the buffer zones full of porosities was a substantial urban parameter [13] that can challenge their proposals. Working or Engaging with market and services in an area that the living and working gets blended, especially with the ever increasing numbers of immigrants and alternative groups of people attracted to the area, where the communal space and the communal kitchen of the activists' social spaces 'kaimakkin' triggers unprecedented socio-economic formulas of living.

Fig. 5: Sushila Installation by a, Myria Christodoulou and Panagiotis Andreou and b Aristeidis Violaris. 2016

Fig. 6: 'The Urban Glenti' by a,b Sande Masidza, c,d Lukas Stocker, e Savoula Papadaki, f, Aristidis Violaris, g, Yvonne Asiimwe , h. Myria Christodoulou. 2016

Fig. 7: Various media and techniques _ towards the 'Thinking Hand'

This individual project, served as the canvas of ideas that the students developed through the previous projects and the diverse set of parallel activities.

The way of seeing is deemed as a vital architectural educational approach that can create original visionaries for the evolution of our built environment. The 'glenti project' and the series of diverse and interdisciplinary mappings established a starting point for notions to be developed. It becomes also an attempt to re-establish and re-focus the direction of the discipline of Architecture towards the human being. The festive milieu is intended to render the urban, everyday life of evolving current cities as an approach to penetrate the 'flesh of architecture from a phenomenological point of perception. The projects invited the sensory and corporeal human experiences to re-establish a human centered architecture. The mapping exercises serve as a means to query conventions of the built environment. The goal is to establish a critical and explorative path towards the production of spaces and living atmospheres, setting the students free from the umbilical cord of preconceived ideas and notions.

6. Parallel activities

The studio works as a vibrant environment that is constantly infiltrated by diverse set of activities. Presentations, lectures, discussions with artists (Karampampas and Attalidou), anthropologists (lecture on the cyprus wedding- research of Vasos Argyrou' by Evi Eftychiou), architects (the Rio carnival by Monica Roccio Neves), the 'situationist city' [14] with the incessant participation of guests from all over the world and of various disciplines, of alumni and 5th year students, of high school students etc. promote the flow of diversity and of of the openness to various 'voices'.

Parallel to the architectural media of representation as the drawings (of various scales), models (of various materials and castings), sketches, collages, hybrid- mixed media representations, and videos the students were asked to crate series of diagrams of the dance and the 'aging' workshop or cognitive mapping for and an experiential happening in the buffer zone under the supporting class Experiencing Architecture (taught with Eleonore Zippelius).

The students were asked to keep all the documentation of their trials and work. At the same time, they developed the culture of keeping a personal sketchbook, where the individual way of thinking and understanding architecture was evidently harnessed.

The constant hand making of various media (Fig. 7) enhances their skills while imbues into their experience new knowledge and understanding, following the educational understandings of Juhani Pallasmaa's 'thinking hand [15]. For every part of their work, the students are required to communicate in written their main ideas and observations by distilling the main points and further enhance their imagination in the form of Haiku poems.

A series of theoretical and literary texts are given to the students throughout the classes to analyze and discuss them. Finally, each student is expected to go through a thorough

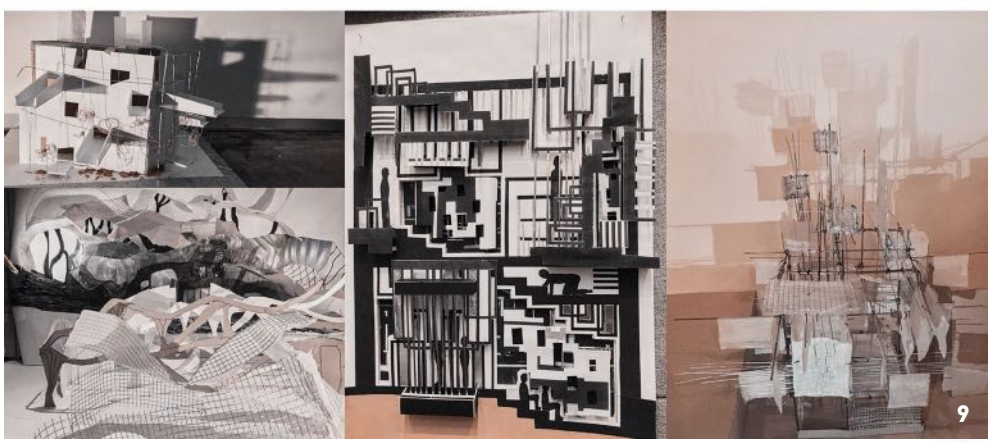

Fig. 8: End of Year Exhibitions and final reviews
Fig. 9: The Urban Glenti, Christos Benjamin, Folashade Toke, Christos Savva, Paola Tsafara

analysis of a couple of the Italo Calvino's texts and continue the writing of the 'Invisible cities' [16]. This retrofits the forging of the identity of their final proposal by scripting their own narrative.

7. Evaluations and exhibitions

Throughout the whole semester, constant submissions, pinups, reviews and assessments kept a continuous flow of high level performance with equally commendable quality and quantity body of work.

During various activities and reviews and especially the installations, midterm and final reviews, the students were called to present their work in front of invited guests, receive comments and participate in a fruitful, constructive discussion by engaging with enticing presentations their audience.

For the final exam (Fig. 8) and the annual end of year exhibition, the students exhibit their work in a way that reflects the vibrancy and the social and environmental sensitivities of the studio. Thus, a new body of creative work is produced, where they edit constantly the work, while presenting in a coherent way the evolution of the whole process.

8. Conclusions (Fig. 9)

The flooding of Extinction Rebellion movements and the ever increasing flooding of refugees cannot but shakingly alarm the discipline of architecture. An enormous responsibility lays on the Architectural education, as the future architects will have no option but to respond to these prevailing issues, the environmental and social 'Matters'. The teaching method of the first year students is crucial in order to nurture the future creators of our built environment – and the people of huge impact on the natural environment- in a way that environmental and social sensitivities become the driving educational forces.

Despite the gloomy aspect of the detrimental impact of the architectural activities on the environment and on social issues, despite the fact that we are so near to the irreversible state of a destructed planet and society, the 'Urban Glenti' (Urban feast) does not necessarily defy the repercussions of the radical deterioration of the current environmental and social conditions. It rather invites the new Architecture students to envision positively a future of the Built and Natural Environments. It welcomes them into the first meeting with the Architectural World through a series of personal corporeal and sensory experiences. It also asks them to continue the 'Invisible Cities' [16] with their proposals of new ways of living where the Human and the Nature become protagonists. Where the right to the city and the right (for everyone) to the joy of the (healthy) city [2] is main concern. 'Any place can serve as joy if it is hijacked' understanding leads them to notions of appropriations and regenerations [2]. Inevitably, the students, through the everyday activities of their future built environments will need to respond to the relationships of the humans, the humans and the environments – built and natural. That leads, also inevitably, to tackle with the reasons of the environmental

and social problems found not anywhere else but the socio-economic systems. The socio-economic systems that define and dictate the built environments and urban-scapes.

In other words, the course attempts to introduce the students to all the interrelationships from a personal experience of the essential act of eating to the structure of the society and the city.

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Urban Garden Follies: The Relevance of Live Projects

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Abstract

This paper explores the City as a Living Laboratory and how complex issues of social and environmental sustainability can be made tangible through student-initiated Live Projects. While there has been a considerable growing interest in Live Projects in different stages of architectural education, translating this Practice into the construction of temporary urban installations within the first-year school curriculum, attempts to connect larger-scale challenges of the city to personal experience. As an alternative method to traditional studio teaching, the Practice of Live Projects [1] encourages the types of collaborative interaction and participatory engagement with the concerns of the city that allow students to take action and to begin to find solutions to real world problems. A crucial step toward this practice is to establish the relevant themes and appropriate scale and timeframes to begin to draw connections between spaces of concern, experimentation and production. This paper offers such a framework developed through a series of temporary interventions that explore 'meanwhile' spaces in the city [2] as sites of engagement and provocation. I hope to suggest that playful interventions can be used as a tool to empower students' engagement with the city and different communities, and also begin to generate plausible initiatives for incremental change. The projects presented in this paper present two particular themes. Firstly, civic concerns through installations that investigated London's underused properties and types of open spaces and thoroughfares controlled by private developers, which local authorities cannot afford to create or maintain. Secondly, environmental agendas through low tech design and innovation which can transform waste into something of tangible value that can be used for providing shelter for communities and space for play and interaction. This paper argues for new types of educational projects that carry a sustained interest in both ecological preservation and in creating spaces for public engagement, and finds that these types of live project merit further exploration.

1. Urban Garden Follies

The *'Urban Garden Follies'* is a series of self-initiated public space installations for the London Festival of Architecture (2010-2013) and Clerkenwell Design Week (2019). As a point of departure, the projects identified different types of overlooked spaces in London and key concepts of sustainability were interpreted as key drivers for the temporary interventions. Constructed as 1:1 spatial interventions in the city, the follies provided potentially new ways of using and occupying London's underused properties, spaces and thoroughfares controlled by private developers. Central to the '*Urban Garden Follies*' were questions around sustainability of place – how to make places open and accessible for everyone, and sustainability through practice – how to apply processes that are environmentally responsible and resource-efficient. '*Post-It/Post-Code*' (Camden 2010) was an intervention into a vacant Victorian house employing recycled paper and timber, '*Back Yard Garden'* (King's Cross 2012) created an impromptu urban green and picnic event space through found material and plant saplings, and '*Bottle House'* (Clerkenwell 2019) [3] explored the reuse of plastic waste to construct temporary shelters.

The Live Projects took place outside of the normal first year curriculum, and introduced the students to questions around sustainable development and to alternative design approaches to engage with the city. The critical agenda behind these follies was the notion of the city as a site for ecological intervention.

The use of Live Projects and the City as a Living Laboratory had three aims:

The first aim, at a macro-scale, was to raise awareness and knowledge of what sustainable place-making actually means by directly engaging the students with the city. The shift from the studio setting to the city exposed the students to live agendas in the built environment. The Living Laboratory moved away from the traditional urban analysis of reading satellite images and invited students to directly experience conditions on the ground.

The second aim, at a micro-scale, was to develop a tool-kit for action that reinterpreted 'reuse', 'recycle' and 'recover' as sustainable forms for intervention. These design principles formed the building blocks for a lifecycle-driven approach to place-making that could be embedded in a Year 1 teaching curriculum.

Finally, the third aim was to define new forms of engagement and to rethink the agency of designers in future place-making. The design and making of the 'Urban Garden Follies' directly engaged the students to become co-creators in this design process.

The ambition for the follies was to 'reduce', 'reuse', 'recycle' and 'recover', and their designs were inspired by art and alternative cultural practices. '*Post-It/Post-Code*' reinterpreted the work of artist Heidi Bucher and Cornelia Parker, whose installations preserve, frame and reveal specific memories of a place. The cyclical reconstruction of the Ise Jingu shrine in Japan inspired the making and detailing of the '*Back Yard Garden'* and the '*Bottle House'*. In all three installations the timber and building components were sourced from reused and found materials. These were later recycled and turned into public tables or used for bonfire nights to open up dialogue with the local neighbours. All seeds and plants were shared with different participants and found their home in different local households.

The '*Urban Garden Follies*' described in this paper form a direct response to the recent 'Architecture Education Declares' movement that questions how education can play a key role in addressing our ongoing ecological crisis [4]. The projects consider an increasing interest on the improvement of social and environmental conditions, and advocate for an ecological awareness and responsibility in architectural education. Through a limited choice of materials and by having to negotiate live sites the '*Urban Garden Follies*' contribute to the students' understanding of the power urban interventions and the role design has to play in responding to the social, political and environmental challenges we face today.

2. Constructing Methods for Design

The projects developed out of range of research methodologies.

- A survey of contemporary topics relating to the city of London the students could engage with was used to construct the starting point for each project.
- A limited choice of building materials for the installations was determined from the constraints of the site and the conceptual narrative of the project.
- A design process was developed that focussed more on emphasising the directions of intent and less the finished artefact.
- An iterative development of projects that grew in scale, co-ordination and complexity aimed to engage and provoke the participating students and the wider public.

The live setting of the projects shifted the focus from the abstract research-led activities of the studio to a participatory design-led engagement with real scenarios. Having to install into real settings meant that the students needed to respond to the physical constraints of given site conditions and available resources, as well as co-ordinating as team, with real clients (the local council or developers) and against set time frames. There was a conscious shift in roles. Tutors changed their position from initiators, to that of a facilitator and co-designers, which allowed the students to take the lead on sourcing recycled or reusable materials for construction, to establish roles and areas of responsibility and to engage directly with the clients and owners of the site. In this way of working two ideas should be emphasised:

2.1. Play and tactility

Key to the design of the installations was to introduce a notion of play and tactility in the work.[5] In the initial stages of the project students were encouraged to respond to a contemporary urban issue and to develop their conceptual response through active discussion, sketching and physical model-making making. This was followed by a number of quick spatial translation exercises, using found materials to develop the final proposal for the urban intervention. Students were then invited to participate in the construction of the installations outside of studio time and could decide how long they could engage with the activity. With the project being live, the work required an amount of improvisation and on-site obstacles and complexities needed to be handled and resolved as problems emerged.

Some of these details could be pretested in the studio, and others had to be developed on site. The tactile qualities for each installation emerged from the inherent material properties and making process of each installation and ranged from photocopying onto post it notes, developing timber joint details out of found palettes to developing new façade elements made from recycled plastic water bottles.

2.2. Sustainability and engagement

The second key driver of the installations was the engagement of students and the wider public with the social and environmental agendas. With limited resources the projects needed to be considered as a full life-cycle. [6] This meant having to think logistically about where material could be sourced from, how it could be moved to site and a later point be disposed of and perhaps rhetorically what message the choice of material carried in relation to the project: How could a post-it note, a mint plant or a bottle form the material texture of the intervention, and at the same time how could the choice of material be read as a critique to a contemporary urban condition?

3. Engaging with Civic Concerns: Who owns the land?

Projects conducted with students from Central Saint Martins from 2009 – 2013, addressed specific civic concerns and played with the question of ownership in the city. Two case studies briefly describe two different questions that were tackled at that time. '*Post-It/Post-Code*' (2010) looked at the number of empty homes in London, while '*Back Yard Garden*' (2012) questioned the notion of private owned public space in the city. Both projects ran in June in conjunction with the London Festival of Architecture.

3.1. Folly #1: Post-It/Post-Code

Post-It/Post-Code (2010), an intervention into a disused Victorian house on Woburn Walk in Bloomsbury, was the first of the *Urban Garden* follies and looked into the number of empty homes in London. The site was one of numerous properties of Camden Council that were disused and lay empty at the time. According to findings from the Camden Council 'one in 16 homes is not lived in on a full-time basis, either because they are second homes, or because they are empty'. A more recent report on empty space in London also suggests that 'more than 20,000 commercial units have been empty for at least six months, and 11,000 for more than two years.' [7]

Our students came across Camden Council's initiative to activate such properties through their unique Pop-Up programme that was set up to support to the council's creative and cultural sector. Following an intense search of empty properties in Camden they discovered a vacant shopfront in Central London's historic Woburn Walk. In a next step the students negotiated a temporary contract with the Council that allowed them to move into the vacant space and set up shop, on the understanding that they would leave within an allotted time. As part of a listed street, the property had to be left as found, forming the constraints for the short-term use and temporary installation within the empty building. Over three days WC1H

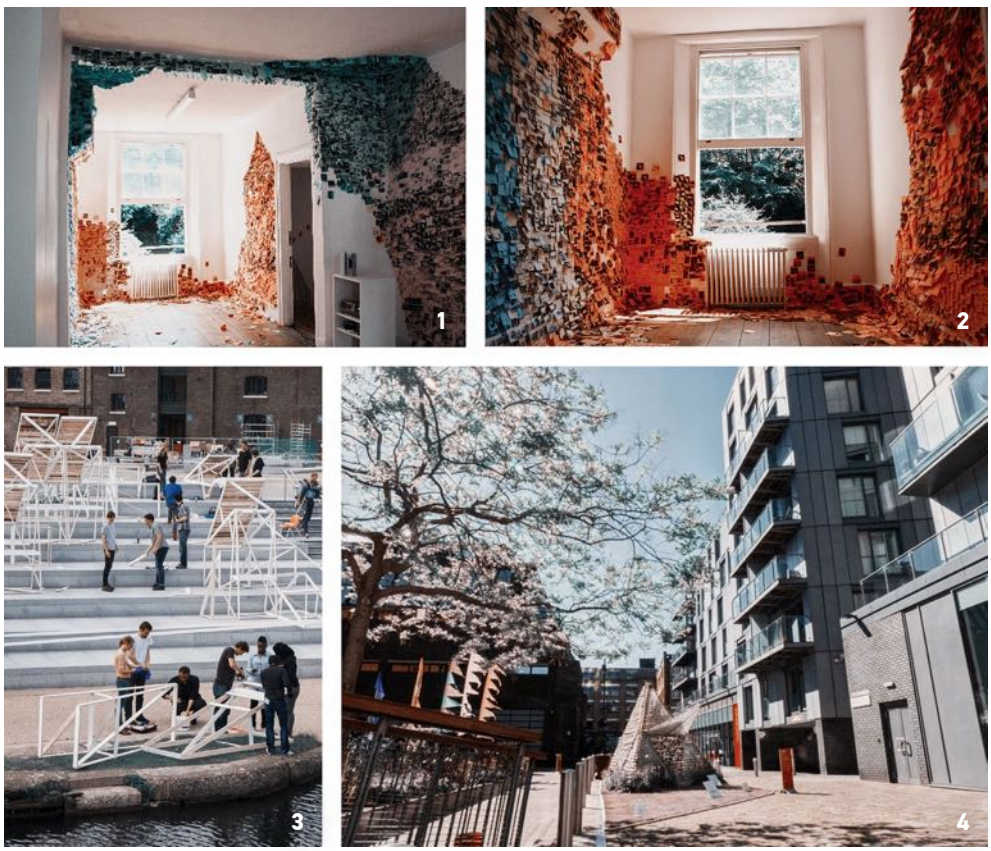

Fig. 1: Folly#1 Post-It/Post-Code (Camden 2010)
Fig. 2: Folly#1 Post-It/Post-Code (Camden 2010)
Fig. 3: Folly #2 Back Yard Garden (Kings Cross 2012)
Fig. 4: Folly #3 Bottle House (Clerkenwell 2019)

0JL Wolburn Walk was transformed into a flexible vibrant exhibition space and was made available to students and the larger local community.

The project aimed to highlight the number of empty properties in the Council, whilst also commenting on the disproportionate shortage of housing in the capital. Students decided to use drawings and photographs of their projects to share ideas as how to improve the city and to display these within the space. The concept was to represent the empty properties *('Post-Codes')* through Post-Its. With nearly 300 homes left empty in Camden for two years, the project also made reference the number of homeless in the capital. Over 9,000 post-it notes were individually produced, to create the texture of the project, which formed a subtle reminder of nearly same number of people who sleep rough on the streets of London every year. [8] The work took four days to produce, two days to install, and visitors and passers-by were encouraged to take back the memos to their own homes.

3.2. Folly #2: Back Yard Garden

The next *Urban Garden Folly*, '*Back Yard Garden*' (Folly #2, 2012), provided a similar critical commentary, this time focussing on London's growing number of Privately Owned Public Land. According to an article in the Guardian, 'the UK is in the midst of the largest sell-off of common space. It transpires that the past few decades almost every major redevelopment in London has resulted in the privatisation of public space, including areas around the Olympic Stadium, King's Cross and Nine Elms'. [9]

Back Yard Garden was the first public intervention on Granary Square since the opening of the new King's Cross development. Coined the largest redevelopment of the UK at the time, the King's Cross development designed by Allies and Morrison and developed by Argent consisted of a series of interconnecting public spaces. This is presented as a model that should form a different take on urban regeneration, one that primarily focusses on public space and the possibilities for children specially to engage in these urban spaces. The Granary Square for example is a fountain that takes the narrative of water and creates temporary water installations that attract the different children from the wider neighbourhood.

The site for the intervention, the steps of the Granary Square, was previously closed off to the public, and the buildings on the square historically faced their backs to the adjacent Regent's Canal. *Back Yard Garden* was therefore proposed as a temporary installation to reverse this relation with the Canal. The proposal was to create a visual and spatial link that would connect Granary Square with the canal through a series of small-scale interventions that pointed toward the edge of the water. It used three elements: timber frameworks, canopies and softer gardens elements that critiqued the lack of informal surfaces within the masterplan.

The elements were designed as playful and flexible components simple in their geometry, allowing a level of improvisation on site. [10] The steps therefore became a public gameboard, with different events being staged over the period of the installation. In the process the configuration of the structures changed, and the level of occupancy differed from people sitting under the canopy to enjoy the new sites to chat, picnic and converse with local

residents, in exchange, bringing different communities together. It inserted a degree of informality into the site, and formed the beginning of a relationship between Central Saint Martins and the immediate neighbours and surroundings.

The installation was made from found palettes and recycled timber, and was therefore restricted to the amount of wood that groups of students could carry. These were sourced from different back yards along the Kings Cross development, and made reference to the industrial nature of the place. The *Back Yard* included temporary mint gardens which was grown during the project – from Easter to June – a commentary on the ingredient of time that is necessary for a place and community to grow. The mint found its way into summery refreshments, and at a later stage was taken by families who dropped by; the wood was later taken to a bonfire to celebrate the end of the installation. The *Back Yard Garden* was therefore seen as a temporary occurrence that appeared for a brief moment, and will continue as a story for the people who happened to have experienced it.

4. Provoking Environmental Agendas: Tools of Engagement

4.1. Folly #3: The Bottle House

Earlier this year the work with students on Live Projects shifted its focus to more global environmental agendas. With students from Ravensbourne University, we collaborated with the design start-up 'Six Miles Across London Limited' and developed and constructed a recycled *Bottle House* shelter made out of low-cost, lightweight and sustainably sourced materials for Clerkenwell Design Week – UK's leading independent design festival. The design of the shelter was inspired by the need to find feasible and sustainable solutions to a global plastic waste challenge. According to *S.M.A.L.L.*'s founder Ricky Sandhu, 'every minute, a million plastic bottles are bought around the world and the number is set to top half a trillion by 2021, far outstripping our recycling efforts and endangering our oceans and coastlines'. [11] The purpose of the *Bottle House* was therefore to engage students with sustainable practices and the need to reduce, reuse and recycle.

Due to the size and complexity of the installation, the architectural design and construction was developed in conjunction with the professional engineering practice WSP. The resulting Kit-of-Parts system and low-tech detailing demonstrated how a simple construction could be made possible with little design know-how. The frame of the structure was made out of bamboo poles joined together in the form of a tipi, with the frame then covered with discarded plastic bottles, which were filled with hay to create more private interiors.

Before working on the project, students were presented with questions around the lifecycle economies of products and how this might feed into a way of thinking through future projects. At the same time, students were asked to collect their own plastic bottles, which would be used for the construction of the *Bottle House* installation. The project was pre-fabricated as a kit of parts in the loading bay of the WSP premises and later assembled on site at the Clerkenwell Design Festival. 1:1 construction and on-site making as a teaching method became direct tools to learn about materiality, construction and detailing, for example how

bring different materials together, how to create robust joints, and finally how to assemble and disassemble various components. The project was also a means of bringing a diverse group of students together around a common goal, providing them with the opportunity to work together and learn to rely on each other's expertise. Working together with an already environmentally-aware generation of students, the challenge was to channel their thinking, create focussed action and find a creative output and form of public engagement around environmental agendas through making.

At the end of the design festival, the grass turf the *Bottle House* had been displayed on was donated to a local children's playground and plants were returned to Camden Garden Centre, a charity that can resell the plants for profit. The project life-cycle can therefore on a whole be thought of as a way to means to reduce, reuse and to recycle.

5. City as Garden

The examples of the Urban Garden Follies provide the experimental ground to expose Year 1 students to questions about social and environmental sustainability. Where the real-life setting offers the students a new lens to the city, the tool-kit of 'reuse', 'recycle' and 'recover' enables them to generate new structures with limited resources, providing an early introduction to the potential role they may take in the process of urban transformation. While we don't quite know what a sustainable future will look like, the Urban Garden Follies provide an opportunity for learning and dialogue, so that we can collaboratively develop a tangible approach for a more sustainable future in our built environment. Similar to the *Post-It/Post-Code* and the *Back Yard Garden* installations, the *Bottle House* is less about the construction of a perfect shelter, but more about provoking and engaging students and the wider public with the urgency to address our evolving ecological crisis. What characterises these projects is how they engage with the city and what conversations they activate.

The first-hand experience of engaging with issues of the contemporary conditions of our cities is a powerful tool to directly confront the students with often neglected contemporary conditions. [12] Reading, negotiating and intervening in city are the first steps to frame their view on their city and to formulate alternative forms of practice and engagement. A real understanding of empty homes, the changing nature of our public spaces and the impact of consumption to our built and natural environments in their first year of education challenges them to directly engage with the real world and the act of making provided them with an agency to change their environment. This formed a unique situation for the students to allow them play and learn on the border between the real world and academia.

In consequence, the challenges set by the *Urban Garden Follies* began to shape common goals and manifestos, which invited the students to become co-creators [13] in the design process. This required the students to work closely together, approach stakeholders and other experts and most importantly take owner ship of the design process. Within this period our role shifted from tutor to mediator and the nature of the process from expert to participatory driven. The construction of the follies became a negotiated activity of trial and error and siting of the projects in the public realm created a unique opportunity to engage with, provoke and animate the wider public.

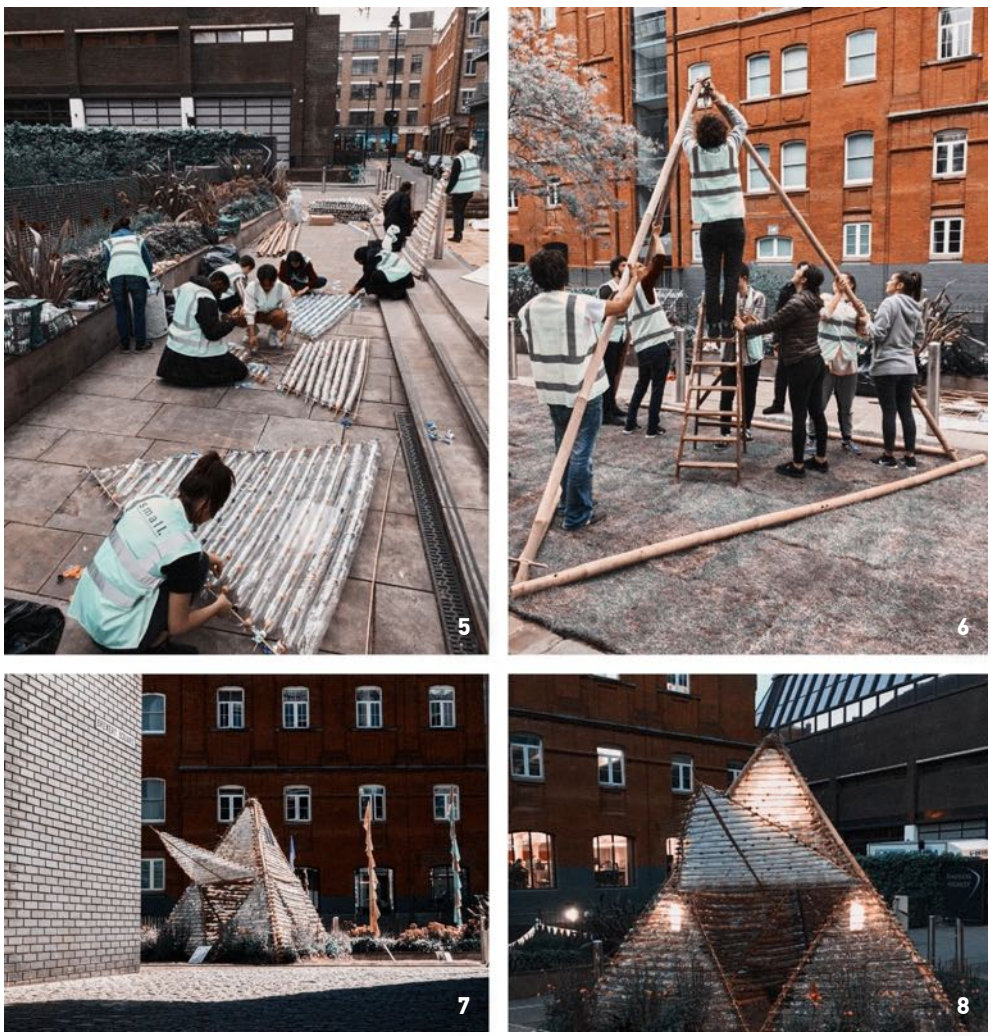

Fig. 5,6: Folly #3 Bottle House Construction (2019)
Fig. 7,8: Folly #3 Bottle House (Clerkenwell 2019)

On a broader scale the series of garden follies can also be seen as seeds for the ecological intensification of different city conditions potentially to provide discreet metabolic functions to parts of the city, from providing simple moments of colour, rest and reflection. Similar to the cultivation of a garden the development of the urban follies over the eight-year period was also a circular activity that was central to the design research and the teaching practice. [14] Reflecting and coming back to these projects, seeing and making something quite different from their original intention, were part of their organic evolution. The process was conversational as it was serendipitous, and each iteration allowed the follies to grow in scale and complexity, with the first folly referring to a local, the latest folly feeding into a global discussion. For the students and tutors involved in the project, the *Urban Garden Follies* are not about giving shape to the future, but about making sense of it. They carry with them optimistic message that through their discourse with the city they can create positive change - one post-it, one seed and one bottle at a time.

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Boundary: a Concept for Tracing Architecture in Urban Design

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Abstract

A boundary is an ambivalent word and can lead to positive or negative connotations depending on how it is applied. It can be something that confines or separates us, but it can also enable a more efficient regulation of circulation. Boundaries can be used for protection, but also to frame a view, direct the gaze or eliminate the awkwardness that can occur in certain social circumstances. Boundary can also be something theoretical, a convention aiming to a more agreeable symbiosis, in which case when crossed it can lead to misunderstandings and discomfort. Based on the above-mentioned framework the architectural design studio Introduction to Architecture in Urban Design, adopted the title boundary, as a recurrent concept for the entire semester. Under this, the students were introduced to various forms and scales of urban coexistence which they were invited to challenge, negate, alter, ameliorate, enhance, amplify, (...), through architecture. The studio's agenda has been anchored to five projects that gradually ascend from scale 1:1 to scale 1:500 so as to point out different and sometimes unexpected urban issues and themes.

Through the exploration of different manifestations of the boundary and their implication to architecture, students were acquainted with fundamental architectural typologies. Discussions, encouraged by the experimentation with variable presentation formats, raised topics regarding to what constitutes an urban experience and how architecture can promote a more efficient "choreography" of peoples' movements in an urban setting or even generate urban actions and events. The encouragement of students to produce narratives and fictitious stories, at any stage of the project, aimed to develop the ability in storytelling and in building on what they already knew while simultaneously challenging any preconceived ideas. Wrapping it up, pedagogically, variation on topics, scale and representation techniques was a means used to explore the students' latent talents and inclinations.

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1. Introduction

The "newborn" Ioannina school of Architecture is considered a rather contemporary school balancing among theory and practice. Main theme in its curriculum is the attempt to familiarize students with the concept of the city from their early years of study [1]. City and the urban is not presented as the milieu of urbanists and planners but mainly of architects and architecture. It is introduced not merely as a matter of form but as a mediated field of knowledge where different aspects of the context, meaning among others location, political, social and economic circumstances meet [2].

2. Why boundary?

The series of exercises proposed for the 2nd semester core studio revolved around the common theme of the *boundary* and the way it can be used as a framework for contemplating, discussing and practicing architecture in the urban environment. Under this theme, the students have been introduced to various forms and scales of urban coexistence which they were invited to challenge, negate, alter, ameliorate, enhance and amplify through architecture.

A boundary is an ambivalent word and can lead to positive or negative connotations depending on how it is applied. It can be something that confines or separates us, but it can also enable a more efficient regulation of circulation. Boundaries can be used for protection, but can also frame a view, direct the gaze, or eliminate the awkwardness that may occur in certain social circumstances. A *boundary* can also be something theoretical, a convention aiming to a more agreeable symbiosis, in which case when crossed it can lead to misunderstandings and discomfort.

Based on the above, students are encouraged to think out of the box and propose "boundaries" that can either separate or unite, encourage interaction, or the creation of micro-environments.

The studio's agenda has been anchored to 5 exercises that gradually ascend from scale 1:1 to scale 1:500 so as to point out different and sometimes unexpected urban issues and themes.

3. The armrest that divides but also connects

Designing an armrest for a public bench is the first exercise chosen to inaugurate the series.

The armrest is an element attached to domestic furniture used for comfortable seating such as armchairs and sofas. It is also greatly used in public seating such as in theaters and conference rooms, as well as in seating equipment used in vehicles and means of transportation such as buses, trains, airplanes etc.

In these public places the armrest, apart from providing comfort, it plays also the role of a distinct boundary which determines the space allocated for each one of its contenders.

Especially in cases where the two people "divided" by the armrest are strangers, they can rely on this apparatus for resolving any awkwardness built by the imposed proximity between two unfamiliar individuals.

The exercise has been developed by teams of two, for a specific bench situated in the campus and has been presented in physical models and drawings scaled in 1:1.

The final presentation took place around this bench. Teams took turns in adjusting their model on the bench and consequently, using their bodies, they performed a short preview of how the armrest could be used explaining the type of interaction they were opting for between users.

Therefore the human as a unit with its body and its ergonomic requirements, its attitudes and habits became a regulator in the discussion of urban coexistence. Most of the teams gave priority to the ergonomic aspect of the armrest, trying to make it as comfortable as possible, while others proposed a more conceptual design element able to promote social interaction between users, accepting the fact that awkwardness is not an issue that can be solely solved through ergonomic gestures.

During the presentation the students were asked to prepare a series of sketches under different timeframe. The degree of details and the quality of the outcome was used as a way to explain scale in architecture.

4. The bus stop, a boundary between ways of movement

Following the armrest, the bus stop was proposed as a bigger in scale, though very common urban design element that addresses a larger group of users. To make the assignment more intimate, the bus stop chosen for intervention was the main campus one located in close proximity to the classroom.

The relevance with the framework of the boundary is the object's marginal position between roads designed for traffic and those for pedestrians and among the different natures of movement –pedestrian and vehicle. On a secondary level it can also be discussed as a boundary between people and the weather.

In order to avoid destructing issues of materiality limitations, the brief asked for a project constructed solely by a fictional super material entitled *D-fi*® imagined as white, smooth, water resistant, insulating, either extremely bendable or super rigid and, if wished, transparent.

The bus stop's main function is "slicing" the buses' routes in order for people to catch them. However it can also provide shelter from the rain or the relentless sun; it can be used as a carrier for information or a sign; it can even become a meeting point.

Students are once again prompted to think of the human as a unit but, given the bigger in scale and more complicated context, this unit acted as a part of a larger total unavoidably related to other units with which has to temporarily share a space. This space is formed by a number of decisions that take under consideration issues of protection, functionality, interactivity,

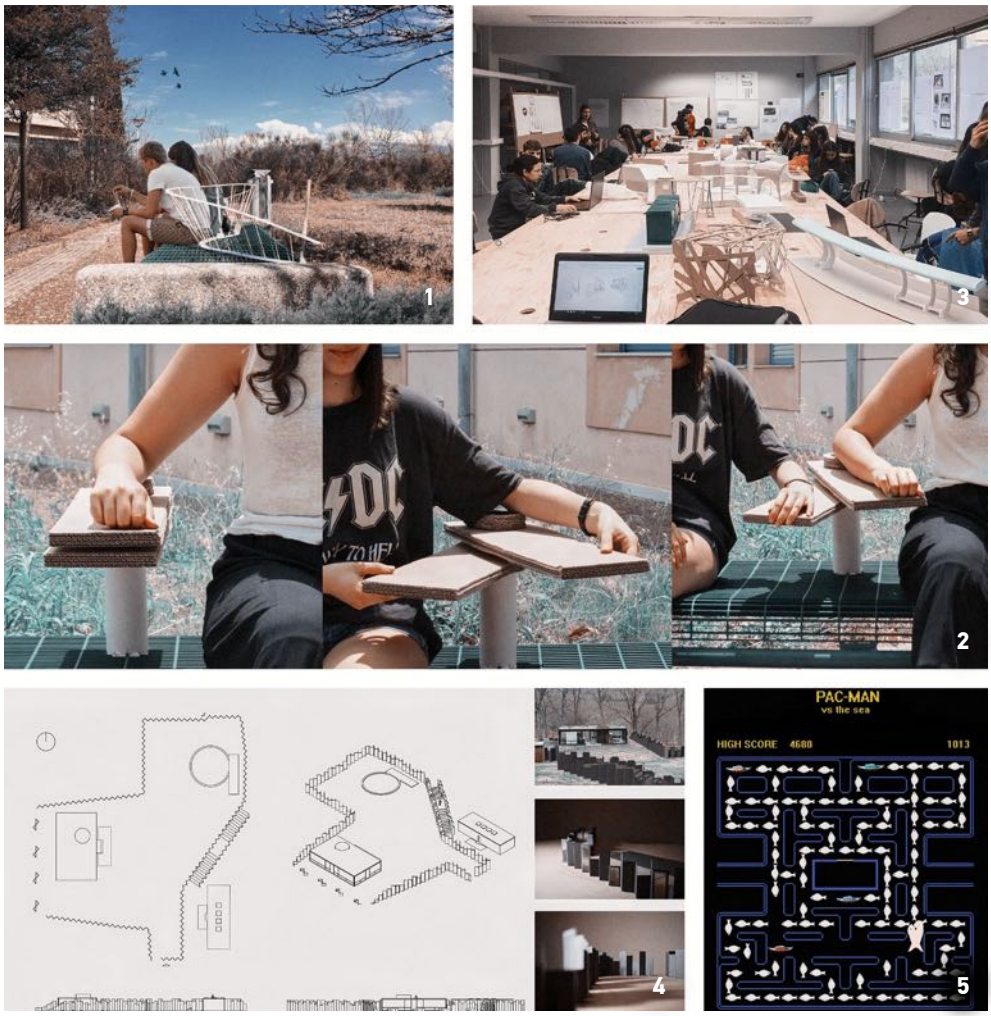


Fig. 1: Continuous armrest serving both sides of the bench proposed by Katerina Kyriazopoulou and Marilena Katsioti

Fig. 2: Rotating armrest for two proposed by Christina Ploumi and Despoina Mastromichali

Fig. 3: Bus stops' models presented in groups of the same typology

Fig. 4: Fence inspired by portable partitions and screens that control visibility, proposed by Katerina Iliadi and Manolis Ditsoudis

Fig. 5: Alexandra Koutsoupa, Despoina Kissa, Elissavet Prevezanou, Margarita Georgiadi and Maria Thalassinou proposed a myth inspired by the popular arcade game "Pac-Man"

symbolism etc. Conclusively the bus stop served as an effective tool for discussing once again people's coexistence but this time in a more complicated urban context.

Through discussions several intentions are revealed. Some students focused on ameliorating the functionality of the typical bus stop, others on the creation of an interactive space which encourages its users to socialize with each other, through the use of electronic equipment, or custom made furniture. Others on creating a quiet shelter that turns its back on the traffic and "opens up" to nature, while others saw the bus stop as an opportunity to promote ecological consciousness and behaviors.

Designing a bus stop proved to be an effective vehicle for understanding and discussing the idea of type in architecture [3] and stroll around fundamental architectural typologies. The projects have been developed in three dimensional models in 1:10 scale and for the final review students have been prompted to place their models under the typology they thought that was expressing their architectural concept more efficiently. *Shelter, Free Elements, Foundation, Canopy, Gate, Symbol* were the "families" proposed and the critique was unleashed for each family of objects rather than for each object itself. The discussion set up the stage for a dive to the history of architecture and for the exculpation of copy [4] and mimesis.

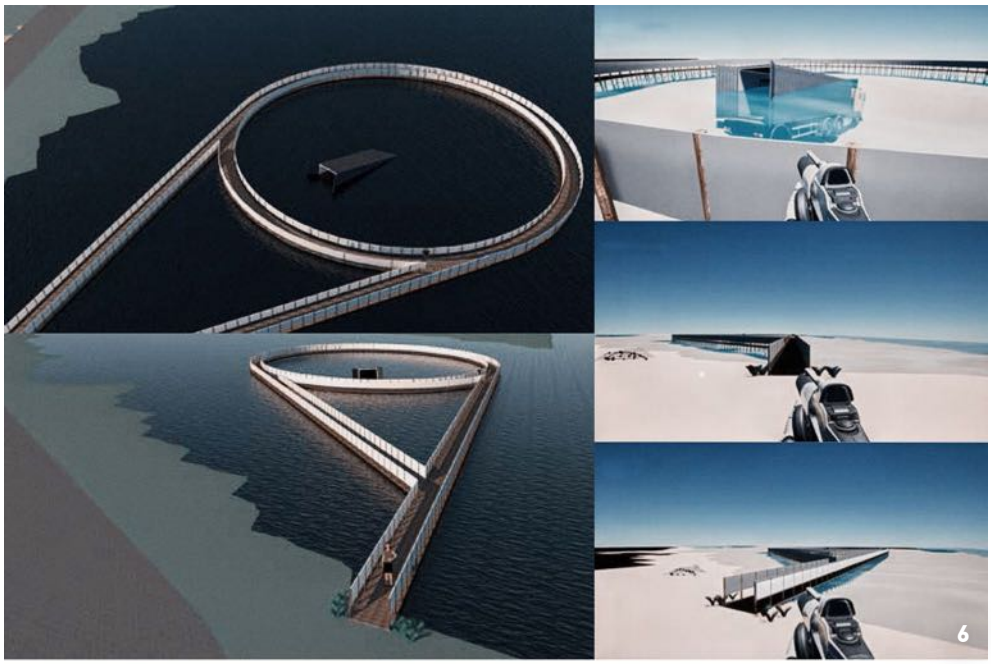
5. The (glass) fence

Moving on to a larger scale, the next project was entitled "fence". After exploring how small scale urban elements act as boundaries that can ameliorate urban coexistence, another important issue was emerged, that of the relation between the public and the private [5] and what types of physical boundaries can be used in order to make this relation either more evident or more obscure.

The fence is an architectural element that often becomes the last priority in the design process, usually outrunned by more important architectural decisions, on top of which is the design of the building it encloses. However in certain areas where privacy becomes a top priority –as for instance in the wealthier suburbs– the fence might be the only manifestation of the existence of a built structure, undertaking the importance of the façade in a dense urban context –as known by the history of architecture.

Beyond the inherent boundary concept the fence assignment focused on more complicated issues as the relation between the built environment and its landscape and the symbolic role of the enclosure for the ekphrasis of an architectural or even sociopolitical ideology. Moreover the understanding of the concept of a given architecture piece and the characteristics of the local vernacular [6] and how each of them can be followed or challenged.

To make the experiment a little more provocative the piece selected for "enclosure" was –nothing less than– the Glass House by Philip Johnson one of the most notable and iconic modern buildings. The irony is quite evident as the house defies boundaries by blurring with the generous surrounding nature. Originally it had no need for a fence, as a part of a large private area in New Canaan, pierced by a series of other pieces designed by Johnson.



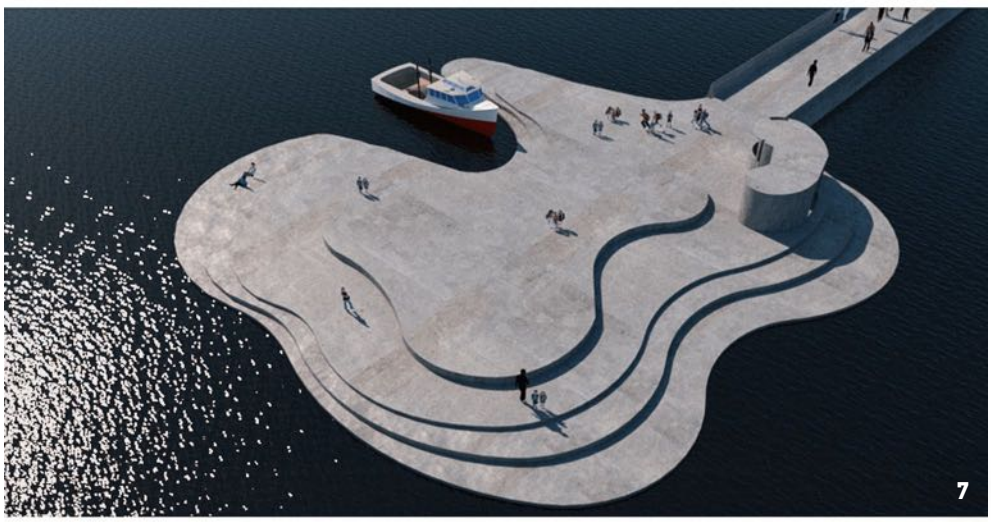


Fig. 6: Students Manolis Ditsoudis, Giannos Petroyiannis Katerina Iliadi, Omer Tshiaba and George Tsikalis made up a myth about a truck sunk in the lagoon. The story was presented as a fully functioning video game

Fig. 7: A pier seen as an artificial landscape proposed by Konstantinos Liolios

Fig. 8: Final presentation of the Pier exercise with the participation of Assistant Professor Katerina Kotzia as an external judge

However, based on a what-if idea, we devised a story according to which the buildings of the abovementioned property were inherited by different relatives who decided to separate their properties.

The responses of the students were once again diverse and sometimes unexpected. Some of them -wanting to be loyal to Johnson- saw the fence as an introduction to a musical piece whose chorus was the iconic building itself. Others employed very compact and opaque structures in order to explore the dynamics of the antithesis between the building and its enclosure. Some of them flirted with the idea of the copy either by designing full scale replicas of the building's facade that acted as a showcase of the building itself or by employing reflective materials that multiplied the buildings image. There were teams that struggled with conveying the concept of transparency and lightness, to materials and structures which are inherently opaque and rigid. Others played with the idea of the revelation and some of them explored the idea of a boundary with minimal or extremely discreet physical manifestation such as boundaries made of plants or dug on the dirt creating a new version of a trench.

Designing in dialogue to a preexisting building is always challenging as the context can be intimidating. However, it is never too early to bring the issue of the relation between the old and the new to the architectural desk. It turned out that the fence became a good starting point for such a conversation, even if the participants are still young and have not yet fully developed their -architecture related- conversational tools.

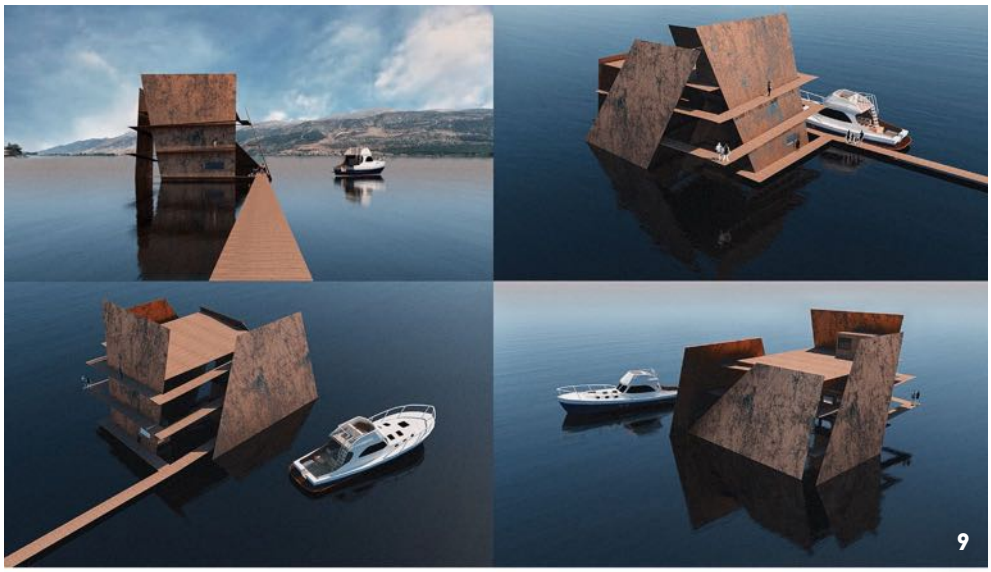
The collage was introduced as a way of presentation not merely for aesthetic purposes but mainly for exploring the idea of superimposing and looking through, or better as a way of defining the nature of visual connections. A parenthesis added to the brief was a hypothesis that students of architecture should have a way to look through the fence to the seminal building, which acted both as an architectural element and as guideline for the images.

6. The fishery as a boundary between waters

The fourth project was again about creating an enclosure, but this time for an unexpected user. It was about redesigning the natural sea farms of the Messolonghi lagoon, a town in Western Greece, also named "divaria" or "ivaria" from the Latin word Vivarium, which means generally a place of life. The sea farm consists of a system of nets and gates. Gates open in order for the fish to enter them after the tide and then they close to trap them in the lagoon.

This time the goal of the assignment was primarily to familiarize students with the concept that each construction surrounding us is the product of a number of design decisions that have reasonable explanation, which can be traced and decoded. In other words, this subject is introduced in order to promote curiosity and expand students' horizons beyond the familiar and the mundane.

The project begun with a thorough presentation of the context, meaning the town of Messolonghi, the lagoon, the fish farmers and how the practices of fish farming evolved throughout time.



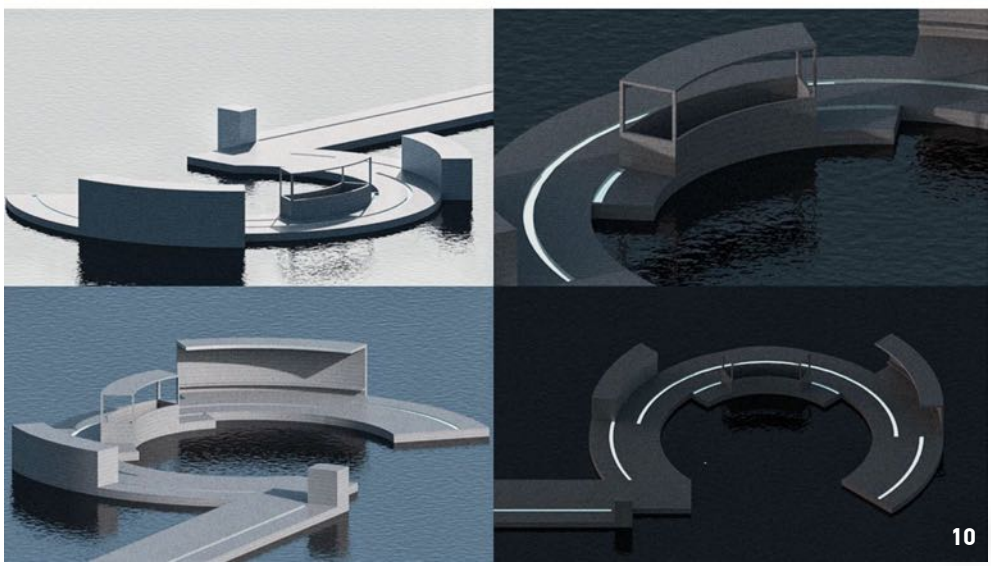


Fig. 9: Vaso Tsioni proposed a Pier that opens a dialogue with the Mitsikeli mountain seen across the lake
Fig.10: Day and Night views of the Pier proposed by Despoina Mastromihali

The brief required for the creation of a myth involving the fish and the fishermen but also mythical creatures of the water like monsters and mermaids, ancient gods and goddesses or urban myths, based on the rich archaeological and historical background of the city.

The encouragement of students to produce narratives and fictitious stories, aimed to develop the ability in storytelling and in building on what they already knew while simultaneously challenging any preconceived ideas. Moreover design based on a myth requires experimentation with representation techniques and exploring other means of expression such as video, animation, painting etc. This exercise proved to be very revealing regarding student's latent talents and inclinations.

7. A pier as an island

The final project of the course was the most complicated as it attempted to touch upon all the issues that were discussed throughout the semester. It was also a pumping in scale and an authentic urban design with programmatic autonomy, almost like designing a whole city.

The brief was asking for the creation of a pier in the lake of Ioannina city, named Pamvotida, for the lake-boats that transport people to and from the little *Kira Frosinis'* island. The proposed site for the pier was a lakeside square, a quiet central and popular area.

The pier is the par excellence boundary between the land and the element of water - be it the sea or a lake. It is mainly a transit area –an intermediate space. It is also an opportunity for expanding the cities boundaries and providing a more diverse urban space that could also serve as a floating square.

The pier had to solve the programmatic issues of a terminal that serves a great number of people while acting also as an enchanting promenade, a new destination for urban wanderers, a landmark for the city, a frame for the view of either the city or the mountains on the other side of the lake.

The project of the pier helped raise topics regarding to what constitutes an urban experience and how architecture can promote a more efficient "choreography" of peoples' movements in an urban setting or even generate urban actions and events.

The presentation introduced among others the tool of night perspectives so as to trace the ability of the pier to act as landmark and as a point of reference not only because of its form but also of its performance. The landmark had to refer to the whole basin, a unique landscape of tall mountains surrounding a lake. This commented on the ability of architecture to address not only the urban scale but also the geographical one [7].

8. Conclusion

The main goal of the course was to introduce the context and the complexity of the city in the first year of architectural education. This was attempted through a series of practices following a *one step at a time* approach. Building the exercises from the scale of the human

body to an urban scale was a tool used for helping students gradually become familiar with the notions of coexistence and cohabitation that are essential in understanding how the city operates as a system.

Encouraging students to work in different teams, to use various and sometimes unconventional means of representation that they felt comfortable with, to actively participate in the discussions that were always part of the presentation procedure, created a fertile ground for the co-creation and sharing of knowledge.

Allowing them to delve into their own experience and trust their own ability of observation, while simultaneously exposing them to unknown design territories and somewhat offbeat exercise briefs, helped in building their curiosity and keeping a balance between what they already know and the knowledge that is yet to come.

The most important tool however proved to be narrowing the discussion to a single concept, that of the *boundary.* Having a single notion as their main focal point helped students prioritize their thoughts and ideas and provided them with a safe starting step. After being confident that they were able to answer to the single requirement of how their proposal acts as a boundary, they started building around this concept and bringing to the table a whole lot of new thoughts and ideas. Thus the *boundary* instead of being a restricting factor as its terminology would suggest, proved to be an effective springboard for limitless reflections and discussions on the context of architecture and the city.

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[1] As introduced during the second half of the 20th century by architects as OMA/ Rem Koolhaas.

[2] This relates fundamentally with the conception of architecture as presented by Professor Michael Hays at Harvard Graduate School of Design theory courses “Buildings, Texts, Contexts”.

[3] Discussing among others the concept of type as presenting by architect and professor Rafael Moneo in his essay “On Typology”, published in Oppositions 13, 1978.

[4] The discussion was based on the research contacted by Korina Filoxenidou and Katerina Kotzia for the workshop “Original Copies”. The workshop was part of the Postgraduate Program “Symbioses”, organized by the Department of Architecture, University of Thessaly in 2012.

[5] The notions of privacy and publicity was discussed also through the seminal book published by Beatriz Colomina. Colomina, Beatriz. “Privacy and Publicity: Modern Architecture as Mass Media”. Mit Press: Cambridge (MA), 1994.

[6] Among others were discussed the texts: Alexander Tzonis and Liane Lefaivre. “The Grid and the Pathway. An Introduction to the Work of Dimitris and Susana Antonakakis,” Architecture in Greece, 15 (Athens: 1981), 178. Kenneth Frampton, “Towards a Critical Regionalism: Six Points for an Architecture of Resistance” in The Anti-Aesthetic – Essays on Postmodern Culture, ed. Hal Foster (Seattle: Bay Press, 1983).

[7] The concept of geographic architecture, an architecture that despite is small scale can achieve a larger character, was discussed under the prism of “new geographies” a research unleashed by architect and professor A. Hashim Sarkis and a team of researchers in the “New Geographies Lab” of Harvard Graduate School of Design.

In Pursuit of Genius Loci:
Developing Urban Awareness at the 1st Year Architecture Design Studio at the University of Brasilia

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Abstract

This paper discusses a pedagogical experiment developed by professors of the first-year Architecture Design Studio Course at the University of Brasilia. The developed method aims to target recurring design problems, particularly the disconnection between the building and urban context and difficulties with ground design. Our goal was to increase urban awareness during design practice and instigate students to see beyond pre-existent scenarios. We designed our method based on the concept of *genius loci* presented by Norberg-Schulz to deepen our understanding of the relationship between the social and physical features of places. The concept helps to interpret architecture as a mean and not the end. We wanted first to improve students' views on the city and ground before design practice. Thus, we divided the course into three parts: "experience", "analysis", and "imagination". In the first part, we invite students to experience Brasilia's urban fabric through site visits, urban sketches and topographic exercises. The second part of the course involved the analysis of contemporary buildings emphasizing relations with the environment. At the third moment students were challenged to design a shelter at a chosen site. As the course advanced, we increased complexity and developed a different representation skill. Brasilia is a symbol of modern architecture worldwide. Its construction marked an important period in Brazilian urban history. Unfortunately, after its construction, the city faced an uncontrolled urban sprawl and a decrease in public spaces and life quality. This paper describes some of our attempts to increase urban awareness and foment the social commitment of architects to build a better environment in the city.

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1. Introduction

In Brazil, undergraduate courses are structured in semesters, not in years. Some courses start the design approach only in the second term. Usually, the first contact of undergraduate students with design is with form studies. In the Faculty of Architecture and Urbanism at the University of Brasilia (FAU-UnB), students have seven semesters of Design Studios, and one year of Final Studio as shown in Fig. 1. Each semester, design complexity is increased as far as the number of functions and urban variables is added to the architectural project. Yet, in the last ten years, it was observed a trend to focus on function rather than urban context. The result is projects where the building is dissociated from the ground and urban environment. Aiming to reverse this situation, we developed a set of strategies at the first Design Studio course (*Projeto Arquitetônico 1*) to approach the ongoing dynamics of the city into design practice. We believe that tackling urban issues and landscape features at the beginning of the design practice can increase urban awareness and gradually encourage students to be more committed to local demands.

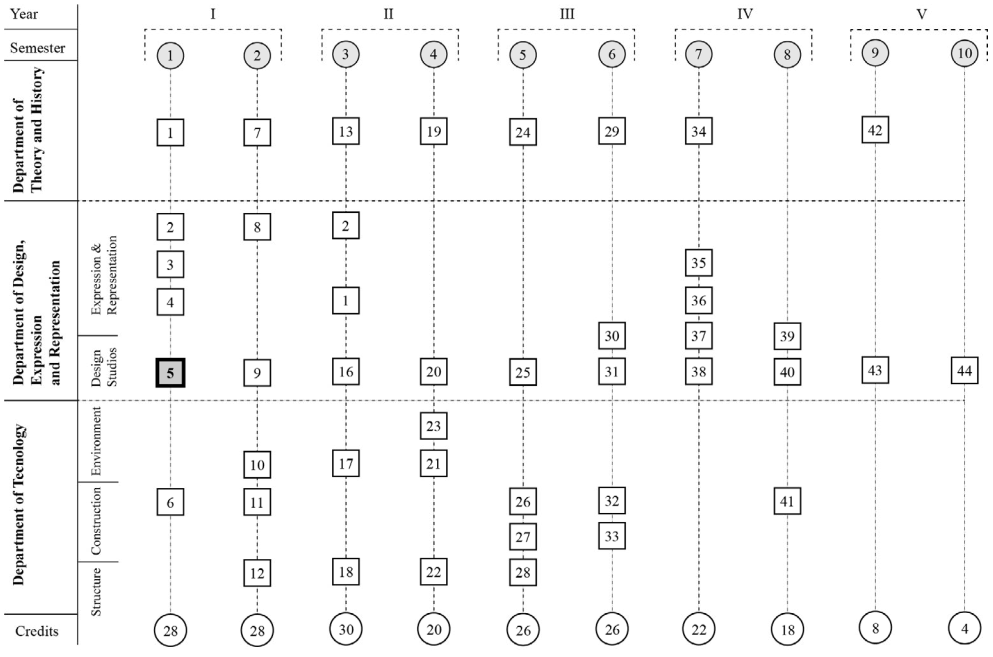
Brasilia is a city that brings together features of the functionalist urbanism of the first half of the twentieth century in a complex arrangement of scales. Beyond its symbolic spaces, the city today thrills in a dynamic of intense population growth and expansion of the territories that orbit its Pilot Plan (the central area designed by Lucio Costa that gathers the powers of the republic and other civic administrative functions, as well as the iconic residential superblocks, commercial and institutional centers, and the areas that border *Paranoá* Lake, the so-called, "bucolic scale"). The arrangement that prevails in the Pilot Plan does not resonate with the other regions of the metropolis - many of which are also designed, but in stark contrast to the city center, especially, the social gap between central and peripherical areas.

Since 2003, the University of Brasilia (UnB) instituted affirmative actions to promote access to college by black and indigenous people, and students from public schools. As a result, cultural and social diversity has increased within UnB and student profile has also changed in the past years. Racism still structures social relations in Brazilian cities and urban configuration. Brazil was one of the last countries in the world to abolish slavery (it occurred only in 1888 with the Aurea Law). Due to the great correspondence between race and class, these policies made it possible for people living in the Brasilia's peripheral nuclei to access college school - many of whom have vague notions about the elements that shape the logic of modern urbanism postulated by Lucio Costa.

1.1. Genius loci as a starting point

In our view, the concept of *genius loci* helps to understand the different urban layers that intertwine on Brasilia's contemporary condition. The term *genius loci*, from a Roman origin, can be translated as "spirit of place". Ancient Romans and Greeks believed that every place and person was born with a guardian spirit that would define their character and essence. According to them, the "spirit" (*genius*) was what gave life to things (NORBERG-SCHULZ, 1980). In the present context, many authors borrowed the concept of *genius loci* to build

the notion of place and locality differing it substantially from the notion of space. Norberg-Schulz (1980) settles the concept of *genius loci* to claim that architecture is the practice of recognizing the *genius* (spirit) of a place, in other words, to recognize the physical, historical, social, and environmental aspects that shape it. Furthermore, the author defends that architects should take an active role to design meaningful and living places. The author has a very critical view of the role of architects towards the urban environment. He claims that architects should focus on situations with their specific design demands instead of analyzing the different kinds and styles of architecture. We believe this phenomenological view of architecture can help us recognizing concrete urban reality beyond the physical and functional approaches.



1 Credit is equivalent to 1 hour/class per week.

1st Year
1. Introduction to Arch. and Urb.
2. Drawing and Plastic 1
3. Architectural Drawing
4. Constructive Geometry
5. Design Studio 1
6. Introduction to Technology
7. History of Arch. and Urb. 1
8. Digital 3D Modeling
9. Design Studio 2 - Language and Expression
10. Environmental Studies
11. Topography
12. Structural Systems in Arch.

2nd Year
13. History of Arch. and Urb. 2
14. Drawing and Plastic 2
15. Building Information Modeling - BIM
16. Design Studio 3 - Housing
17. Thermal Comfort
18. Structural Systems - Reinforced Concrete
19. History of Arch. and Urb. 3
20. Design Studio 4 - Large Spans
21. Acoustics and Sound Comfort
22. Structural Systems - Steel
23. Lighting Comfort

3rd Year
24. History of Arch. and Urb. 4
25. Design Studio 5 - Tower Bldg.
26. Installations and Equipments
27. Construction Materials
28. Structural Systems - Timber
29. History of Arch. and Urb. 5
30. Design Studio 6 - Complex Functions
31. Landscape Design 1
32. Urban Infrastructure
33. Construction Techniques

4th Year
34. History of Arch. and Urb. 6
35. Aesthetics and Art History
36. Urban Planning
37. Urban Design 1
38. Supervised Practice in Design
39. Urban Design 2
40. Design Studio 7 - Historic Heritage
41.Supervised Practice in Construction Site

5th Year
41. Theoretical Essay
41. Introduction to Final Design Studio
42. Final Design Studio

Fig. 1: School program of Faculty of Architecture and Urbanism (own translation). Last updated: 1st March 2016.

2. The ongoing process of design

Taking the concept of *genius loci* as a foothold to prepare the course, we developed observation, analysis, and design exercises to educate the eye about the landscape and urban environment. The activities are assembled into three units, namely: experience, analysis, and imagination. In the first unit, we introduce urban context through site visits and topographic studies. The second is an analytical phase with the study of repertoire and site intervention analysis. The last unit is devoted to design a project inserted in a real site. All the activities of each unit are listed as shown in Table 1.

2.1. Unit 1: experience

Our theoretical inquiry has on the horizon the exchange among all who seek to imagine future alternatives to the present condition of the city. Therefore, we consider the experience a generator of meaning for urban life and, therefore, potentially capable of destabilizing the perception of the city, ruled by the homogenizing dimensions prevailing in the architectural practice in Brazil. Experiences are considered here fundamental in the conceptual and practical elaboration of city planning because they provide us with consistent inputs for intervention in the built reality, at local scales, and even in territorial areas. Moreover, they are markers of historical trajectories and help us to reflect on the time and space woven of material and cultural relations. In practice, experience destabilizes the hegemonic notions of intervention in the cities. We do not propose a dissociated reading of the place, its context, and senses. From the beginning, we reiterate the serious reality of the metropolitan area of Brasilia. The conflicting relationship with the urban milieu, experienced firsthand by many students, leads us to build problems with them as we travel through the city spaces, and thus cross a new world of phenomena and expressions.

Body-space-city

Before introducing design practice, we start trying to enhance the comprehension of the human body. At the first exercise, students are urged to elaborate on another understanding of the link between human body's proportions and its relations with space. Students themselves choose activities in which they are familiar or interested in (like dancing, cooking, playing an instrument, etc.) and have the task to produce observation drawings on these themes (see Fig. 2). In this first activity, we also read essays about two core topics that lead the first-semester course: to inhabit and to design. The readings contribute to arouse understandings about the disciplinary connections between built space and architecture. Simple and objective questions are presented for students to relate to the activities, such as size and proportion. In this way, we believe students maintain intense contact with the context in which they are inserted.

Ground experiences

The rarefied and abstracted urban fabric, the isolated buildings, and the projection system leaving the ground floor free, impose particularities on the design. We point out deployment as an essential aspect to be considered in the project. This is the starting point for the exercises that follow. After explanations about the urban configuration of Brasilia's Pilot

Plan and its appropriation, we introduce essential concepts on topography. Students are instructed to intervene in hypothetical or existing sites with the following limitations: adopting a predetermined arrangement (e.g. a mesh organization; a combination of triangular shapes; an association of circular forms, among others); and making use only of elementary geometric shapes (points, lines and planes) as shown in Fig. 3. This exercise leads students to reflect on the impact of ground design in shaping the landscape and the complexity of soil manipulation.

Theme	Representation abilities	Exercise	Unit
1. Relations between body and space; 2. Theoretical definitions of "design" and "inhabit"	Drawings of the human body in action.	T1	Unit 1 (experience)
3. Grounding procedures; building deployment; Topographic elements manipulation	Physical model; plan and sections.	T2 T3	
4. Comprehending interior scale / intervention in a built area.	Two vanishing points perspectives.	T4	
5. Introducing structural systems	Isometric views; diagrams; physical models.	T5	
6. Urban analysis	Urban scale physical model.	T6	Unit 2 (analysis)
7. Project Analysis; repertoire	Isometric views; diagrams.	T7	
8. Preliminary studies of an urban intervention Conceptual and formal definitions	Physical model; orthographic representation; plan and sections; two vanishing points perspectives; Isometric views.	T8	Unit 3 (imagination)
9. Urban Intervention	Physical models; orthographic representation; plan and sections; two vanishing points perspectives; Isometric views.	T9	

Table 1. Relations of themes, representation's abilities and exercises.

2.2. Unit 2: analysis

Our emphasis is on a fundamental activity of architecture: building a shelter. From this general definition, each semester we develop a different theme, for example, a space of light, a sound space, a water space, and so on. Before designing the shelter, the second unit is devoted to the site analysis. First, students analyze an existing project, observing deployment, form, and urban constraints. Secondly, students analyze an urban area of Brasilia's Pilot Plan selected for the shelter project. To support the analysis, students have to build a scale urban model using maps and doing site visits (see Fig. 4). This task was conceived to promote collective work. In class, we stimulate group discussions on urban situations using the model prepared by the students. We believe this activity gives a wider perspective of the intervention area's surroundings and develops the ability to evaluate peers' works on future tasks. In this unit, it is important to observe the existing uses and the different possibilities that the chosen urban stretch evokes. General themes are distributed so that the class can produce a joint interpretation, namely: the main elements that shape the landscape; the main activities identified in public spaces - and the possibilities that may arise from it; the built and vegetation elements; and the morphological configuration of the urban fabric.

2.3. Unit 3: imagination

As we begin the design studies, we encourage students to think about issues identified in the second unit (devoted to an urban analysis) and initial course experiments (focused on representation abilities and in comprehending architectural conceptual notions). At Unit 3, students have the task to place a small shelter in the urban fabric of Brasilia's Pilot Plan. The assignments are individual and each student is responsible for intervening in a specific area of the selected urban area. According to our teaching guidelines, the shelter should work as an urban intervention fitting the topography of the land. So, ground design plays an important role to establish the connection between the building and the surroundings. Considering the level of complexity, we set some limitations on the shelter size and area (one single floor and maximum area of 100sqm), but none on the ground design to encourage students to expand their projects on an urban scale. At the end of the course, we expect students to better measure the urban impact of their projects, to understand the social interactions within the heritage area of Brasilia, and to reframe their image of the city.

3. Concluding remarks

The main goal of the proposed method was to broaden students' understanding of the urban context in which they lived and designed, expanding their abilities to perceive that every project begins tied to specific urban conditions. Brasilia is a World Heritage City, which brings us the symbolic challenge to propose interventions in its spaces. The city also has its dynamics in the present. Thus, the formal basis is as much important as the generative principles that govern urban interactions. We worked on the links between these two dimensions, establishing a sense of belonging and identification that enable students to

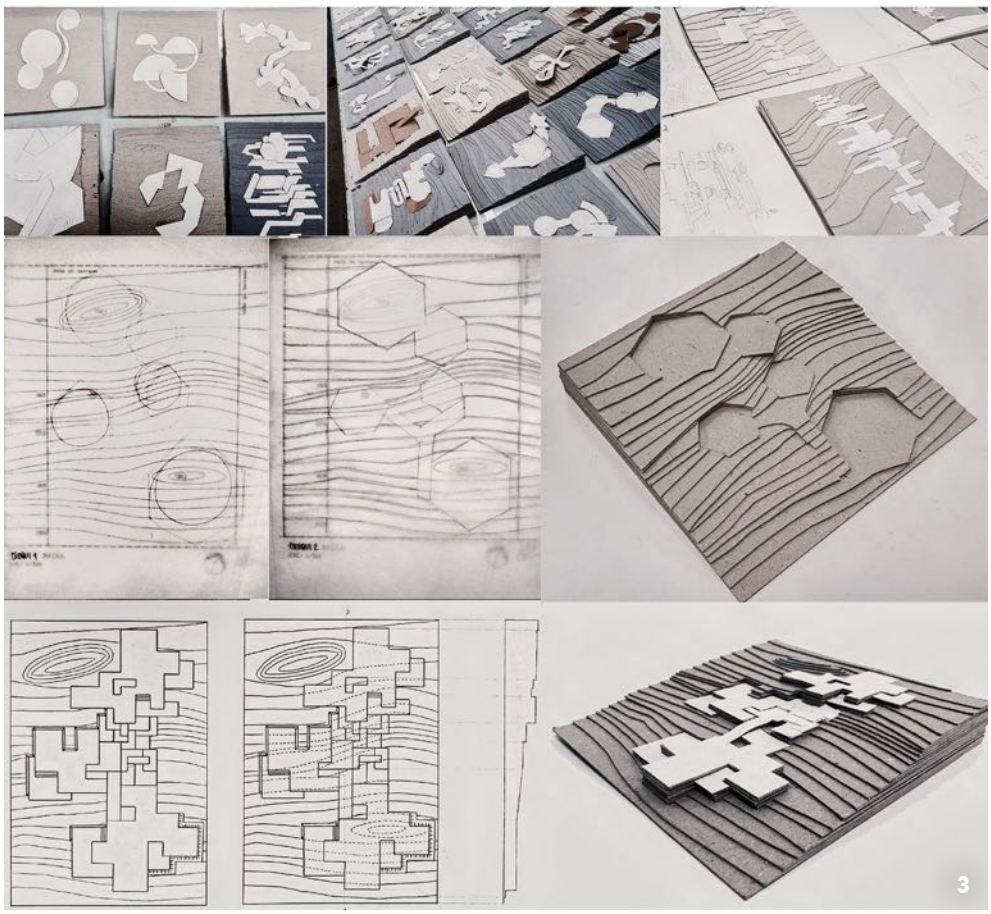


Fig. 2: Studies on the relations between body and space through observation drawing (exercise T1).
Fig. 3: Ground design works using different themes (exercise T3).

intervene and propose built spaces. We tried to identify the characteristics that define livable spaces and give meaning to the place they share in the city.

This pedagogical experiment has been developed and transformed over the last five semesters. As the course went by, we did changes based on the results achieved in each class. As soon as an exercise was completed, we had collective discussions on how we could improve the course. In this sense, some important challenges emerged: a) to broaden the links between representation and proposition, since mastery of drawing techniques is still limited among newcomers. As a result, this creates a divide between what they can think and what they can draw; b) to improve the dialogue with professors of other subjects that constitute the initial cycle of the architecture and urbanism course to promote a coordinated rhythm between the contents taught and the activities developed; c) to deepen the theoretical-conceptual understanding of the importance of architectural design in the contemporary urban space, formed by a myriad of fragments which is the result of the intervention of different actors.

Our main target was to educate the eye about the landscape and to develop a critical view of Brasilia's plan and its urban development throughout the years. In this sense, the term *genius loci* was a fundamental inspiration to provide us with a phenomenological approach to space and a broader sense of the city's complexity. Yet, there was no intention to discuss this philosophical concept with students, but an attempt to apply it to design practice.

Fig. 4: Scale urban model made by students for site analysis (exercise T6).

Fig. 5: Students' architectural interventions on different urban situations (exercise T9).

Fig. 6: Seminar presentations of the final assignment.

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Inventing Fundamentals

Constructivism in Architectural Design Education

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Abstract

The set-up of the first-year courses in architectural design at Eindhoven University of Technology (TU/e) has, in recent years, shifted from general design assignments ('design a building for given requirements on a given site') to assignments divided into clear consecutive steps, each aimed at particular operations in the design process – and, accordingly, from a teacher-centered to a student-centered approach. This allows the students to slowly but steadily build a coherent collection of skills, which together form the skill-set and experience needed for the complex operation of architectural design. This has been done based on two ideas, on the notion that design is a complex and open-ended skill, and on constructivism as a theory of learning. The first of these ideas has been elaborated by multiple authors, for example by Donald Schön in *The Reflective Practitioner*. The second idea, that of constructivism, is based on the work of Jean Piaget and Lev Vygotsky, which says that learning is the active construction of meaning by the learner. Learning happens when the learner is confronted with new understandings about reality that are in conflict with his or her prior knowledge, and because of this is forced to reconstruct his mental representation of the world. In a constructivist course the role of the teacher changes to being the facilitator for this process of constructing meaning. In the first-year design courses at TU/e, 'scaffolding' for the students has been provided with sketch workshops, a set of categories to help to explore different possible solutions, and a sequence of themes as a framework for the course (space – sequences of spaces – light – sightlines – façade composition – structure - material – detail). To make this approach effective the didactical idea should be made explicit to the teachers, and reflection should be well-integrated in the set-up of the course.

Keywords

education / architecture / urbanism / constructivism / reflection-in-action / design / design process

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1. Introduction

The set-up of the first-year courses in architectural design at Eindhoven University of Technology (TU/e) has, in recent years, shifted from general design assignments - 'design a building for these requirements on this site' - to assignments divided into clear consecutive steps, each aimed at particular operations in the design process. This has been done based on two ideas, the notion that design is a complex and open-ended skill, and on constructivism as a theory of learning. The two architectural design courses in the first year of the bachelor curriculum at TU/e will be discussed below from the point of view of these two ideas. The questions which will be discussed are whether this approach would benefit from being applied in a more radical way, and whether – and if so, how - it should be made explicit to the students.

The first year of the three-year bachelor program at the department of the Built Environment at Eindhoven University of Technology is mainly a general introduction to the entire field of the built environment, and to engineering in general. Next to basic courses, which every first-year student at TU/e has to follow, the first year courses of the department give an overview of its four units: next to architecture and urbanism, these are urban systems and real estate, structural design, and building physics and building services. This has as a consequence that the amount of time specifically dedicated to architectural and urban design is relatively limited in the first year: 7 ECTS of the total of 60 - about 12% of the credits of the first year program. This specific design education takes place in the two courses which will be discussed below. Both courses, *BAU Studio 1* and *BAU Studio 2*, are project courses, in which students work on more or less realistic design assignments, in small groups, the result being an individual design. The first assignment, in BAU Studio 1, lasts a mere four weeks, the second, BAU Studio 2, has eight weeks.

2. Design as a complex, open-ended and sophisticated skill

In his book *The Reflective Practitioner* Donald Schön contrasts the model of what he calls 'Technical Rationality', the scientific way of working in which theoretical knowledge precedes action, and variables are always controlled and preferably only changed one at a time, with the way *practitioners* work, who operate in situations which are complex and cannot be controlled as if in a laboratory-like setting, situations in which it is impossible to isolate variables and assess the influence of each individual variable unequivocally. These are situations of "uncertainty, instability, uniqueness and value conflict" [1, p. 50]. The practitioner is not acting from outside, but he himself is part of the reality he is acting on, and with his actions, this reality changes. According to Schön, the way practitioners approach a situation like this is by first forming a hypothesis about it, and then testing the validity of this hypothesis by (hypothetically) applying it in an experimental way. Applying and testing, or action and reflection, happen simultaneously: Schön calls this *reflection-in-action*. Practitioners base their hypotheses on their knowledge of previous examples which are similar to, or have characteristics in common with the situation at hand. Often this is *tacit knowledge*, and the selection of these previous examples happens intuitively. The kind

of situations practitioners have to deal with are therefore complex – many variables change at the same time -, open-ended – depending on the hypothesis, the course the experiments take and the way the variables influence each other, the outcome will be different –, and sophisticated – dealing with these situations requires experience and skill. Two of the practices Schön uses convincingly as examples for his argument are architecture and urban planning.

In *Making Explicit in Design Education: Generic Elements in the Design Process*, Elise van Dooren et al. elaborate, starting from Schön's observations, and using findings of many more authors on the subject, a generic framework for the design process. Made explicit, this framework can be used for design education. The framework consists of five elements: design is done by *experimenting* and *exploring*, uses *hypotheses* or *guiding themes*, works on different *domains* or *work fields* simultaneously, needs a *frame of reference* or *library* (of possible solutions), and has its own *laboratory* (in case of architecture the visual language of sketching and modelling).

If design is indeed complex, open-ended and sophisticated, the question is how it can be taught.

3. Constructivism and learning in small consecutive steps

Constructivism, as a theory of learning, says that learning is an active construction of meaning by the learner. Learning happens when the learner is confronted with new understandings about reality that are in conflict with his or her prior knowledge. With the effort of bringing the knowledge already present in accordance with the new experiences or knowledge, the learner constructs new meaning, which he adds to his view of the world. New stages in the development of the learner are understood as "constructions of active learner reorganization" [3, p.11].

The theory of constructivism is about cognitive development, and generally seen as being founded on the work on the cognitive development of children of Jean Piaget, Swiss psychologist (1896 – 1980), and of Lev Vygotsky, Russian psychologist (1896 – 1934). Generalizing, the emphasis in Piaget's work is on the stages of cognitive development, and, later on, how cognitive development takes place, by *assimilation* (fitting new experiences to already present knowledge), *accommodation* (adjusting the current structure of knowledge to be able to fit in new experiences) and *equilibration* (balancing the opposed effects of assimilation and accommodation). Vygotsky's work emphasizes the role of language and the importance of social interaction in constructing meaning – interactions with other human beings are internalized to form new mental constructs. Vygotsky says that learning happens in the *zone of proximal development* (ZPD), which spans the distance between the current state of development of the learner and the level he could potentially reach "through problem solving under adult guidance, or in collaboration with more capable peers" [4, p. 86].

Constructivist education should therefore be *active* – it is the learner who actively constructs new meaning, and who is responsible for his own development, *constructing* – in the sense

that the learner must build new knowledge on prior knowledge, *cumulative* – development is adding new knowledge to prior knowledge, and *goal-oriented* – learning happens most effectively if the learner knows that he will gain from it [5, p. 277].

Typically, education in architectural design by means of practical project assignments has many characteristics of constructivist learning already – and it is, because design is a practical activity, particularly well-suited for a constructivist approach. It is active, constructing and cumulative because students have to actively construct their own solutions to the problem given, and they have to construct new knowledge from what they experience in doing this. It is goal-oriented as it is very clear what the purpose of the activity is. It is learner-centered as the outcome of the project will be individual and the role of the teacher can only be to guide the student through the process needed to get to a solution – this solution is not predetermined by the teacher. It is challenge-based: the student will only reach the goal by working actively on a solution. Working in a studio provides the social environment in which sociocultural meaning can be constructed in dialogue with peers and teachers.

Apart from emphasizing the active role of the learner, constructivism also suggests that effective learning should be done in well-determined steps: these steps should build on each other, should not be too big (as each step has to be connected to the knowledge, or skill, gained in the prior step) and should, in order to be goal-oriented, be tuned to the exact new knowledge or skill which has to be gained. A well-determined succession of steps can, in that sense, act as a 'scaffold': the steps provide a ready framework or model for the process needed to complete the assignment. This tuning has been attempted in the two first-year design courses mentioned above, based on the notion of design as a complex, open-ended and sophisticated skill.

4. First first-year architectural design project at TU/e

The first experience with architectural and urban design for students starting at the department of the Built Environment of TU/e is short: about two days during four weeks, eight days in total, are devoted to a first small architectural design project in the first semester of the bachelor program – other subjects covered in the same 10 ECTS course are planning and real estate, structural design, building physics and drawing and digital media – the course is explicitly a general introduction. The assignment is structured as a typical design assignment in a nutshell: the first week is devoted to first sketches and the analysis of the context and the list of requirements, the second to explorative sketching and generating design variants, the third week is for refining and elaborating material and detail, the fourth is for presentation and processing feedback. This division in four steps may already be seen as a scaffolding framework to facilitate constructivist learning, but this is not different from typical design assignments at TU/e.

Two elements in the framework of the assignment are more specific. The first is the start of the work of the students at the first studio meeting of the course. The very first thing the students do is a pressure-cooker style sketch workshop: in one and a half hour the students have to make first very quick sketch proposals, considering at least positioning, massing

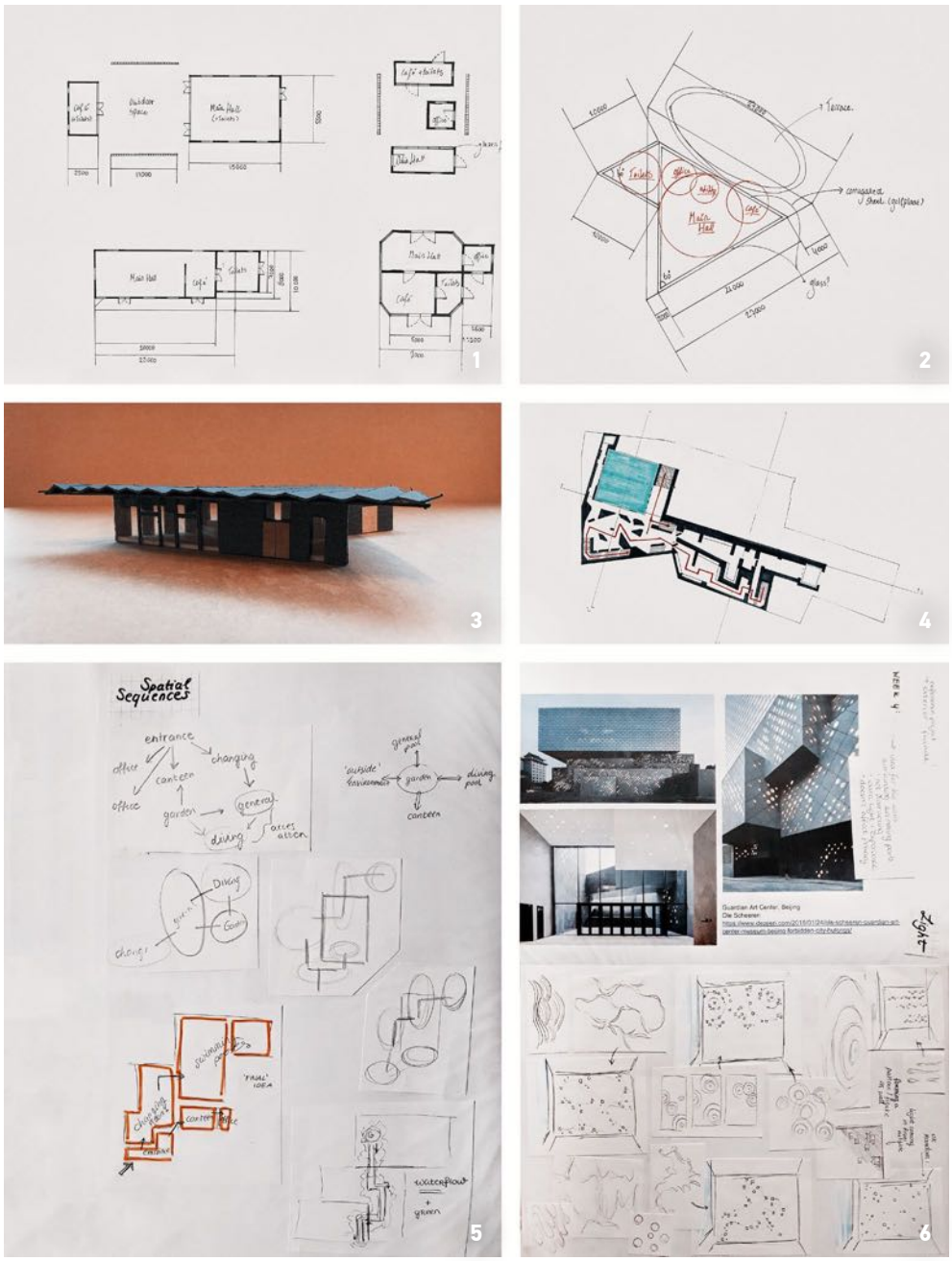


Fig. 1: Variants of the lay-out of plans - Fenne Jansen
Fig. 2: Abstract lay-out of the final plan - Fenne Jansen
Fig. 3: Model of the final result – Fenne Jansen
Fig. 4: Sequence of spaces – Babette van Tilborg
Fig. 5: Sequence of spaces – Lieke Diederen
Fig. 6 Studies on light – Lieke Diederen

and possibly the overall organization of the plan. This is meant to confront the students with all things uncertain and unclear about the task they will have to perform – in constructivist terms, to confront them with all aspects for which their current skill and knowledge does not have solutions yet, as to challenge them and 'open' their minds for new knowledge.

The second is a set of categories given to the students in the beginning of the second week, as a guide for generating variants, or alternative solutions. The categories are taken from *The Place of Houses* by Charles Moore, Gerald Allen and Donlyn Lyndon and give four principles for fitting a building to its context (merging, claiming, enfronting and surrounding) and six principles for organizing plans (rooms linked, rooms bunched, rooms around a core, rooms enfronting the outside, a great room within, and a great room encompassing). This is to help the students to generate variants, and to provide them with three of the building blocks of the skill of designing seen as complex and open-ended: that design is done by exploring (in this case: with variants), on different domains (in this case: context and lay-out of the plan) and with a frame of reference (in this case: one of the many possible categorizations).

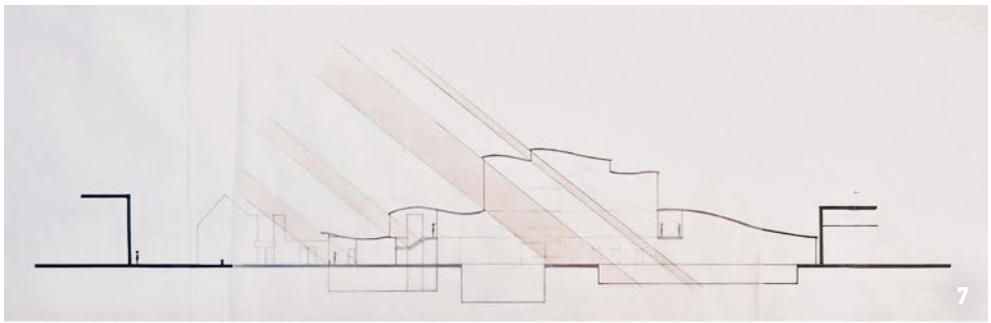
One example of student work with these categories can be seen in Fig. 1. In this stage the variants are still very basic. But apparently the exercise triggered thinking about the organization of the plan in more abstract categories, which can be seen in Fig. 2, after four weeks resulting in the design shown in the model seen in Fig. 3.

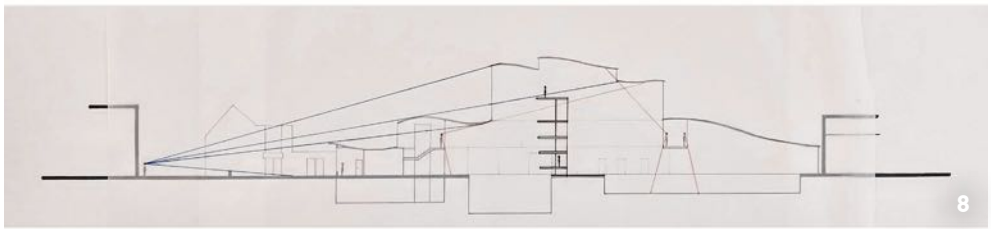
5. Second first-year architectural design project at TU/e

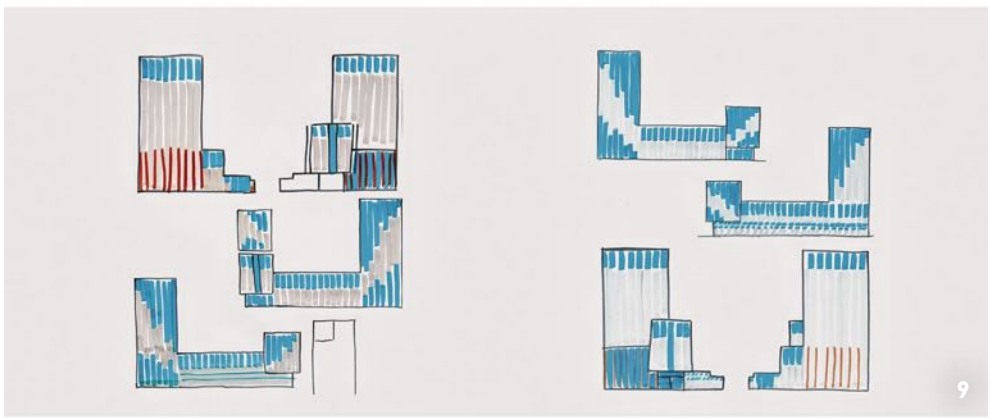
The second design project takes place at the end of the first year. This time the project has eight weeks and 5 ECTS, which is entirely for the architectural and urban design project (students who decide to specialize in another direction – planning and real estate, structural design, building physics – do other assignments, however with the same program and the same site). This time, the steps in the framework of the project are not about how to organize a design process in general, but take urban and architectural aspects as guiding themes. The aspects are, consecutively: *space* ('start with the design of the most important interior and exterior space), *sequences of spaces* (again interior and exterior), *light* ('determine how light, natural and artificial, enters your building'), *sightlines* and *façade composition, structure, materials*, and *detail*. These aspects are formulated as abstract categories on purpose, to ensure reflection on an abstract level.

So again the structure of the course is designed as a 'scaffold' to help the students to construct their own knowledge and skill – their own meaning for the material they discover. In relation to the view of design as a complex, open-ended and sophisticated skill, the steps in this case are aimed at making *domains* explicit, and at building a *frame of reference* – a personal library of possible solutions for all kinds of design problems. The element of exploring and experimenting is incorporated in the steps themselves – if all went well the students learned in the first project how to explore in order to find design solutions.

The illustrations show the way the students worked with the given steps (no final results are shown). In Fig.4. the question to think about sequences seems to have triggered an







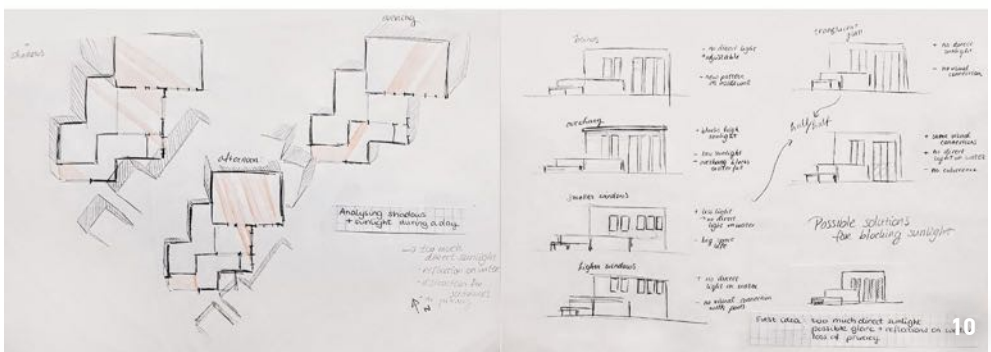


Fig. 7,8: *Studies on light and sightlines – Jeruël Schut*
Fig. 9: *Façade composition – Camille Kleibergen*
Fig. 10: *Light and façade composition – Lieke Diederen*

idiosyncratic solution. A way of thinking that stays closer to the organization of the program is shown in Fig. 5.

Two examples of students working on light show that this aspect too can be approached in many different ways, Fig. 6 and 7. Fig. 8, from the same design, shows sightlines. The fact that the students first worked on light and sightlines apparently gave them clues about façade compositions, as can be seen in Fig. 9 and 10.

6. Discussion

The first question to address here is whether this approach would benefit from being applied in a more radical way. This question arises because there seems to be a tension between, on the one hand, the strictness suggested by the structure in well-determined steps and, on the other hand, the (individual) freedom needed for a constructivist approach, where the learner constructs his own new meaning, which he therefore has to be able to construct individually. This freedom also seems to be needed for the complex and open-ended character of the design process, which needs exploring, and hence the freedom to do so. As it is now in the two projects, the freedom teachers and students take seems to prevent the constructivist set-up to be exploited to its full potential. But if a more radical application would mean that the steps of the framework would have to be followed more strictly, the structure would probably become too much of a straight-jacket. As a constructivist approach is learner-centered by definition, an improvement of the effectiveness of the courses might very well be found in teachers being more aware of their role in such a set-up. A pitfall for design teachers can be to concentrate on the actual design (with the risk that the teacher only imposes his own convictions), instead of on the skill of designing (in which case the teacher is more of a facilitator, as he should be in a constructivist set-up). In the end, the goal of the education is not the quality of one particular design a student makes, but the acquisition, by the student, of the *ability* to make *many good designs*. A more radical approach has to be found at the side of the teachers.

The second question is whether the courses would benefit from making the didactical ideas behind them explicit to the students. From a constructivist point of view one could say that this would improve the extent to which the courses are goal-oriented: it would make the goal of the courses more clear. But the goal of the courses is not insight in didactics. And as the scaffold of the didactic structure is only there to help the learner to construct his own meaning, the scaffold itself is of no importance for the learner to know. As the goal of the courses is to acquire the skill of designing, making this *skill* explicit would be very beneficial. Donald Schön already emphasized the importance of reflection. And the reflection should not only be about the design at hand, but also about the methods used: only then tools to solve future design problems are internalized. The same is true from a constructivist point of view: when the learner reflects on *how* he constructed new knowledge and skills, when this is made explicit, retention - the soundness of the newly formed structure - will be much better. Again, the teacher has a role in this: he has to make these things explicit, and include reflection on what has been done in the tuition. Peer-reviews could serve the same purpose, as reflecting on the work of peers of course help to make own considerations explicit too.

As learning is development, and reflection and making explicit are driving forces for development, the two first-year courses in architectural and urban design at TU/e will benefit from making the didactical ideas more explicit to the teachers, and from a better integration, in the set-up of the courses, of reflection and making things explicit.

Acknowledgements

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Bauhäusler in Chicago: László Moholy-Nagy, Mies Van Der Rohe and the 'Re-invention' of Teaching Models

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Abstract

This paper focuses on the analysis of Ludwig Mies van der Rohe's curriculum at the Department of Architecture of the Armour Institute of Technology, which would be renamed Illinois Institute of Technology (IIT), and László Moholy-Nagy's curriculum at the New Bauhaus in Chicago. Special attention is paid to the teaching of the "Visual Training" course at the Armour Institute of Technology, which had some affinities with the "Preliminary Course" (***Vorkurs***) of the Bauhaus and was taught by Walter Peterhans, a Bauhäusler invited by Mies to join the Armour Institute of Technology, and served "to train the eye and sense of design and to foster aesthetic appreciation in the world of proportions, forms, colors, textures and spaces". Mies prioritized "Visual training" over freehand drawing. For him, visual training was "indispensable as a means of recording an idea", and drawing was to be understood as "a means of fostering insight and stimulating ideas". Mies's "Program for Architectural Education" was founded on his belief that students should be confronted, during their very first year, with the awareness that technique and ideas are interlinked. For this reason, he encouraged students to use drawings as a means of seeing. The overarching curriculum moved from "Means" to "Purposes" to "Planning and Creating". Among the most discussed features of Bauhaus pedagogy is the Preliminary Course, the so-called ***Vorkurs***. The way László Moholy-Nagy, director of the New Bauhaus founded in 1937, incorporated certain aspects of the ***Vorkurs*** in his curriculum, and especially in the Preliminary Course, at the New Bauhaus maintained the binary relationship between technology and aesthetics characterising Bauhaus pedagogy: that between ***Werkmeister*** and ***Formmeister***. However, Moly-Nagy replaced this binary relationship by a more complex tripartite system organised around art, science and technology. Moly-Nagy believed that a new individuality was a prerequisite condition for a new society and his pedagogy was based on an ensemble of concepts drawn from Goethe's under-

standing of epistemology and John Dewey's pragmatism. One of the main objectives of this paper is to show that Moly-Nagy's pedagogical and epistemological vision was based on an effort to reconcile humanistic anti-materialism, and a perception of experience as a set of situations linked to Dewey's conception of education.

The paper examines the philosophy of Mies van der Rohe's curriculum at the Department of Architecture of the Armour Institute of Technology, which would be renamed Illinois Institute of Technology and László Moholy-Nagy's curriculum at the New Bauhaus in Chicago. It sheds light on the different successive phases of the pedagogical process at the former, and the significance that the notions of civilization, culture and *zeitwille* had for Mies van der Rohe's pedagogical agenda. In parallel, it presents the philosophical context on which Moholy-Nagy based his choice to pay particular attention to the relationship of arts with technology. It also explains why Moholy-Nagy intended to replace the bilateral relationship between aesthetics and technology with a more complex tripartite system connecting arts, sciences and technology.

Mies van der Rohe's "Program for Architectural Education" (Fig. 1, 2) for the Department of Architecture of the Armour Institute of Technology, which would later be renamed Illinois Institute of Technology (IIT), was founded on his belief that students should be confronted, during their very first year, with the awareness that technique and ideas are interlinked. For this reason, the first-year programme encouraged them to use drawings as a means of seeing. The overarching curriculum moved from "Means" to "Purposes" to "Planning and Creating". In other words, Mies divided the curriculum into three main progressive stages, that would be preceded by a short period of "preparatory training", which was influenced by the so-called *Vorkurs*, the preliminary course at the Bauhaus. For Mies, the main components of "preparatory training" would be mathematics, natural sciences and drawing. In parallel, he considered that the main objective of the preparatory training would be "to teach the students to draw, to see proportions and to understand the rudiments of physics before starting the study of structural means" [1].

The "means" were divided into material, construction and form. Informative for understanding the philosophy of not only the "preparatory training", but also of the whole educational programme that Mies suggested as newly-appointed Director of the Armour Institute of Technology is what he called "General theory", which included the six following sub-categories: mathematics and natural sciences, the nature of man, the nature of human society, analysis of technics, analysis of culture, and culture as obligatory task. As George Schipporeit remarks, in his foreword to *Mies van der Rohe: Architect as Educator*, Mies's curriculum was based on the idea that during the first phase of education, the students should focus on the development of their "drawing ability and visual perception, progressing through Construction as an understanding of principles, acquiring the technical knowledge of related Engineering and studying Function as a way of understanding problems and building types" [2]. Therefore, during the first three years the pedagogical agenda was concentrated on the sharpening of visual and spatial perception, while the last two years of education were conceived as serving to enhance the synthesis of the skills acquired previously.

Walter Peterhans, who used to teach photography courses at the Bauhaus and was invited by Mies to join the faculty of the Department of Architecture of the Armour Institute of Technology, started teaching the "Visual Training" course there in 1938. He placed special emphasis on the role of visual perception for architectural practice. Of great importance for understanding the main principles of Mies van der Rohe's curriculum in Chicago are the remarks in his text entitled "Program for Architectural Education", in which he comments on the logic of the "Visual Training" course. Mies believed that the "Visual Training" course served "to train the eye and sense of design and to foster aesthetic appreciation in the world of proportions, forms, colors, textures and spaces". In parallel, he prioritized "visual training" over freehand drawing. For him, "visual training" was "indispensable as a means of recording an idea", while freehand drawing should be understood as "a means of fostering insight and stimulating ideas". Mies described the philosophy of the "Visual Training" course as follows: "*Visual Training is a course which serves to train the eye and sense of design and to foster aesthetic appreciation in the world of proportions, forms, colors, textures and spaces. We attach incomparably more importance to visual training than freehand drawing or drawing from nude. Sketching is indispensable as a means of recording an idea, clarifying it and communicating to others; but as a means of fostering insight and stimulating ideas visual training has quickly shown itself to be a greatly superior method since it begins as a deeper level in training the eye for architecture.*" [3]

In order to better grasp Mies's pedagogical agenda of one should take into consideration the attention that he paid to the notion of *Zeitwille*, which expresses simultaneously a Schopenhauerian "will of the age" and a "will of time", as it is developed in his article "Baukunst und Zeitwille" (1924), but also his understanding of individuality. [4] In "The Preconditions of Architectural Work" (1928), Mies claimed that " [t]he act of the autonomous individual becomes ever more important" [5]. The ambiguity of Mies's simultaneous interest in impersonality and the autonomous individual is pivotal for understanding the tension between the universality and individuality in his thought. Mies favoured the acts of the autonomous individual, while rejecting the endeavour to "express individuality in architecture", as becomes evident when he affirms that " [t]o try to express individuality in architecture is a complete misunderstanding of the problem" [6]. Mies until the end of his life believed that "architecture must stem from sustaining and driving forces of civilization." [7] He believed that if the architect, during the procedure of concretising his ideas, manages to capture the "driving forces of civilization" and to convert them into a space assemblage through the process of "Baukunst", then the products of human intellect, in his case the architectural artefacts, acquire a universally and timelessly valid effect on the human intellect. What is very interesting and paradoxical is that, in order to achieve this timeless and universal validity, the individual intellect, in our case that of the architect, should manage to grasp the specificity of the "Zeitwille". These ideas had an important impact on his conception of architectural education, as becomes evident in a letter he sent to Henry T. Heald in December 1937, in which he claimed that the curriculum he proposed "through its systematic structure leads an organic unfolding of spiritual and cultural relationships". In the same letter he also declared that " [c]ulture as the harmonious relationship of man with his environment and architecture as the necessary manifestation of this relationship is the meaning and goal of the course of studies" (Fig. 3).

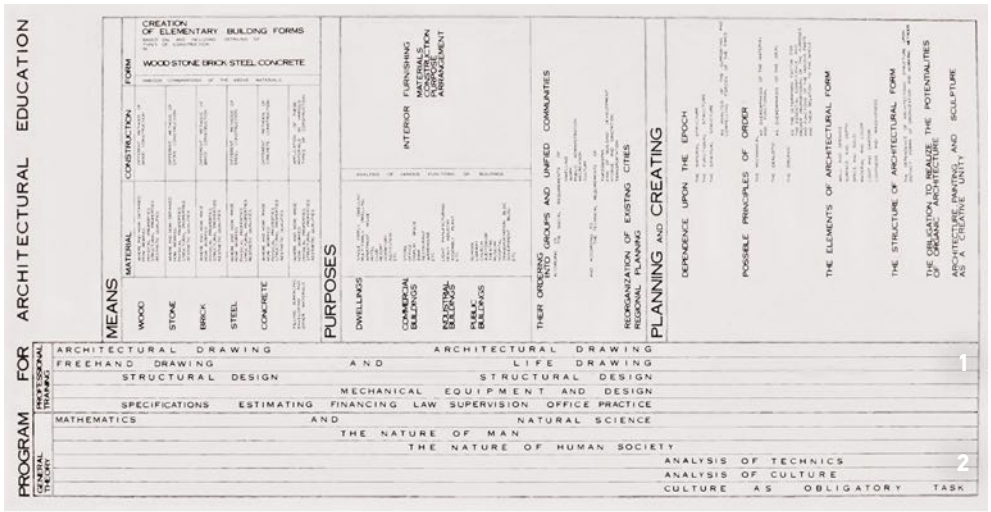


Fig. 1: Program for Architectural Education. Illinois Institute of Technology. 1938. Courtesy of Brenner Danforth Rockwell.

Fig. 2: Mies with his students at IITdiscussing some problems they have come up in their individual projects. While emphasizing fundamental principles of architecture, he reminds them that "God is in the details". Photography taken by Frank Scherschel on 1 November 1956. Credit: Getty Images (Source: "Emergence of a Master Architect," in Life 42 (18 March 1957): 68.)

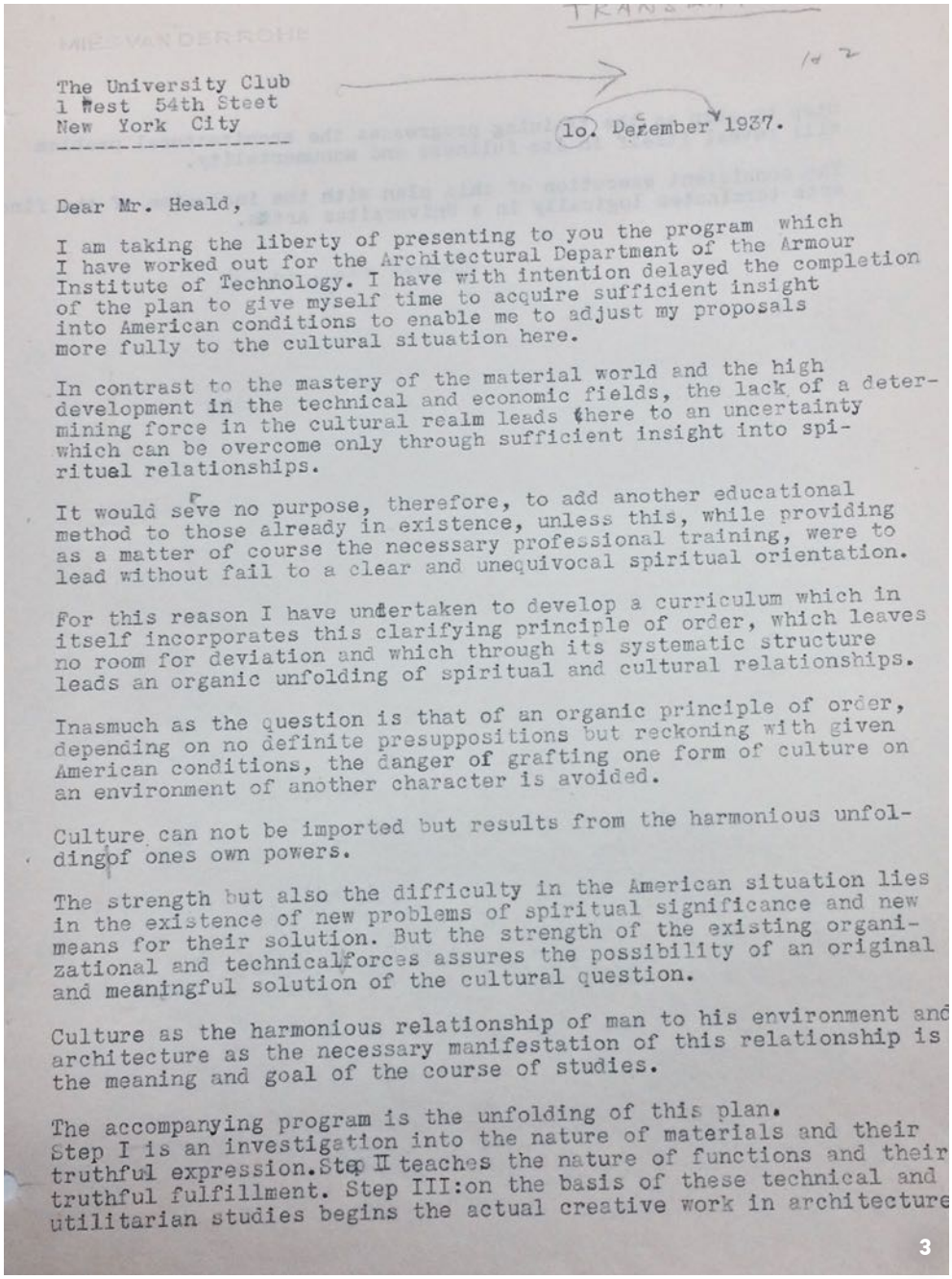
This quotation makes the importance of culture for his pedagogical agenda clear (Fig. 4). He continued writing: *"The accompanying program is the unfolding of this plan. Step I is an investigation into the nature of materials and their truthful expression. Step II teaches the nature of functions and their truthful fulfilment. Step III: on the basis of these technical and utilitarian studies begins the actual creative work in architecture."* [8]

A year before his death, Mies declared, in January 1968: *"Teaching forced me to clarify my architectural Ideas. The work made it possible to test their validity. Teaching and working have convinced me, above all, of the need for clarity in thought and action. Without clarity, there can be no understanding. And without understanding, there can be no direction — only confusion."* [9]

Undoubtedly, the strategies employed in the *Vorkurs* at the Bauhaus constitute the precedents for the exercises given to the students in the framework of the "Visual Training" course. According to Peterhans, who taught this course, "Visual Training [...] [was] a [...] conscious education for seeing and forming, for aesthetic experience in the world of proportion, shape, color, texture, space" [10]. Its philosophy was based on the conviction that sensory knowledge can be a path to insight. What is of particular interest for this paper is the fact that the innovative quality of the "Visual Training" course taught by Peterhans lay in his intention to reconcile aesthetic and scientific perspectives instead of prioritizing one over the other. Another distinctive characteristic of the didactic vision behind "Visual Training" is the fact that it treated the students' own work as its main material. Thus, tutees were invited to sharpen their visual perception on their own artefactual products, and not on pre-existing cases or works of major architects that already occupied an important position within architectural epistemology.

For Mies, clarity was important not only in terms of its application to the design process, but for pedagogy as well. This becomes evident from what he declared in his inaugural address as Director of Architecture at Armour Institute of Technology, in 1938, in which he underscored the significance of "rational clarity" for education. More specifically, he declared that " [e]ducation must lead us from irresponsible opinion to true responsible judgment". His pedagogical vision was characterised by the intention to replace "chance and arbitrariness" with "rational clarity and intellectual order." [11] The main principles on which his curriculum was based were, thus, the promotion of clarity and order. Regarding the importance of clarity for education, he remarked: "If our schools could get to the root of the problem and develop within the student a clear method of working, we could have given him a worthwhile five years." [12] In a letter that accompanied the "Explanation of the Educational Program" (Fig. 5), which Mies sent to Henry T. Heald on 31 March 1938, he wrote: "I lay special worth upon the sharpening of the powers of observation and the development of the capacity to create imaginatively as well as a general control of the quality of the students' work by photographic methods" [13]. Mies believed that the teaching of "Visual Training" by Peterhans could serve this purpose.

László Moholy-Nagy resigned from his teaching position at the Bauhaus, where he had served as the director of the *Vorkurs* and head of the metal workshop in Weimar (1923-1925) and Dessau (1925-1928). On 6 June 6 1937, Moholy-Nagy received a cablegram from the



The University Club
1 West 54th Steet
New York City

1o. December 1937.

Dear Mr. Heald,

I am taking the liberty of presenting to you the program which I have worked out for the Architectural Department of the Armour Institute of Technology. I have with intention delayed the completion of the plan to give myself time to acquire sufficient insight into American conditions to enable me to adjust my proposals more fully to the cultural situation here.

In contrast to the mastery of the material world and the high development in the technical and economic fields, the lack of a determining force in the cultural realm leads there to an uncertainty which can be overcome only through sufficient insight into spiritual relationships.

It would seve no purpose, therefore, to add another educational method to those already in existence, unless this, while providing as a matter of course the necessary professional training, were to lead without fail to a clear and unequivocal spiritual orientation.

For this reason I have undertaken to develop a curriculum which in itself incorporates this clarifying principle of order, which leaves no room for deviation and which through its systematic structure leads an organic unfolding of spiritual and cultural relationships.

Inasmuch as the question is that of an organic principle of order, depending on no definite presuppositions but reckoning with given American conditions, the danger of grafting one form of culture on an environment of another character is avoided.

Culture can not be imported but results from the harmonious unfolding of ones own powers.

The strength but also the difficulty in the American situation lies in the existence of new problems of spiritual significance and new means for their solution. But the strength of the existing organizational and technical forces assures the possibility of an original and meaningful solution of the cultural question.

Culture as the harmonious relationship of man to his environment and architecture as the necessary manifestation of this relationship is the meaning and goal of the course of studies.

The accompanying program is the unfolding of this plan.
Step I is an investigation into the nature of materials and their truthful expression. Step II teaches the nature of functions and their truthful fulfillment. Step III: on the basis of these technical and utilitarian studies begins the actual creative work in architecture

3

Fig. 3: Mies van der Rohe's letter to Henry T. Heald, 1 December 1937. Credit: Ludwig Mies van der Rohe papers, BOX 5. Manuscripts division, Library of Congress, Washington, DC.

Association of Arts and Industries inviting him to become director of the School that would be named "The New Bauhaus: American School of Design". Three months later, Moholy-Nagy presented the education programme of the New Bauhaus at Knickerbocker Hotel in Chicago (Fig. 6-10). When he left from London, where he had been living since 1935, to settle in Chicago on 2 July 1937, as Terence A. Senter remarks, Moholy-Nagy "left unfinished the management of a MARS exhibition" [14]. In "Why Bauhaus Education?" [15], published in 1938 in *Shelter,* he presented the main points of the programme of the New Bauhaus, which officially opened on 18 October 1937. In an article entitled "The New Bauhaus and Space Relationship" published in 1937, Moholy-Nagy defined space as "the relation between the position of bodies", and underscored the significance of the biological bases of space experience, drawing an analogy between the experience of space and that of colours and tones. He also maintained that one can sharpen the way one experiences space through practice, and highlighted the need to create "a genuine space system, a dictionary for space relationships". In the same article, he also argued that one of [...] [the] most important components [of architecture] is the ordering of man in space, making space comprehensible" [16]. The New Bauhaus had to close after a year of enrolment because the above-mentioned association stopped supporting it. After its closure, Moholy-Nagy founded the School of Design (1939-44), which would be renamed Institute of Design in 1944 and would later be integrated in the Illinois Institute of Technology (IIT).

It is worth noting that Moholy-Nagy paid particular attention to the relationship of arts with technology. In parallel, he placed emphasis on the introduction into arts education of methods coming from philosophy and social sciences. A main characteristic of his curriculum at the New Bauhaus was the replacement of the bilateral relationship between aesthetics and technology with a more complex tripartite system connecting arts, sciences and technology. This gesture of bridging arts, sciences and technology offered Moholy-Nagy the possibility to give a more "scientific" dimension to the interpretation of the design process. Moholy-Nagy believed that the preliminary course could help students acquire "technique and skills" and increase "their expressive power". In parallel, he was convinced that it could contribute to the accumulation of experiences that could help students shape and refine their spiritual background, and their emotional existence. Regarding this issue, he made the following remarks, in *Vision in Motion: "The acquisition of technique and skills increases the expressive power of the individual; and with the accumulation of experiences his intellectual status is refined. The refinement in turn affects his emotional existence."* [17]

If one wants to grasp the nature of the interconnections between arts education and philosophy education in Chicago in the late forties it would be useful to reflect on the connections between Moholy-Nagy's pedagogical agenda and the logical-positivism-oriented context at the Department of Philosophy of the University of Chicago during this period. Within this context, important figures were Rudolf Carnap, who was a major member of the Vienna Circle and an advocate of logical positivism and had also been invited to the Bauhaus to give lectures on several occasions, but more importantly Charles Morris. In the framework of his effort to introduce philosophy into the education of the arts, Moholy-Nagy invited Charles Morris, who at the time was teaching at the Department of Philosophy at the University of Chicago, to contribute to the teaching of the New Bauhaus. Morris, who taught a course

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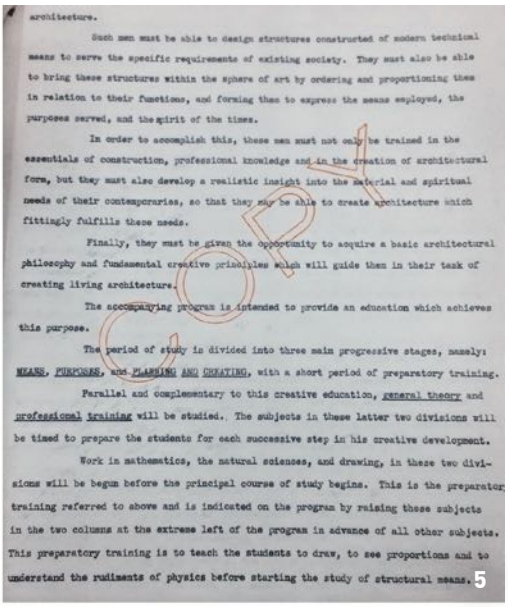

architecture.

Such men must be able to design structures constructed of modern technical means to serve the specific requirements of existing society. They must also be able to bring these structures within the sphere of art by ordering and proportioning them in relation to their functions, and forming them to express the means employed, the purposes served, and the spirit of the times.

In order to accomplish this, these men must not only be trained in the essentials of construction, professional knowledge and in the creation of architectural form, but they must also develop a realistic insight into the material and spiritual needs of their contemporaries, so that they may be able to create architecture which fittingly fulfills these needs.

Finally, they must be given the opportunity to acquire a basic architectural philosophy and fundamental creative principles which will guide them in their task of creating living architecture.

The accompanying program is intended to provide an education which achieves this purpose.

The period of study is divided into three main progressive stages, namely: MEANS, PURPOSES, and PLANNING AND CREATING, with a short period of preparatory training.

Parallel and complementary to this creative education, general theory and professional training will be studied. The subjects in these latter two divisions will be timed to prepare the students for each successive step in his creative development.

Work in mathematics, the natural sciences, and drawing, in these two divisions will be begun before the principal course of study begins. This is the preparatory training referred to above and is indicated on the program by raising these subjects in the two columns at the extreme left of the program in advance of all other subjects. This preparatory training is to teach the students to draw, to see proportions and to understand the rudiments of physics before starting the study of structural means.

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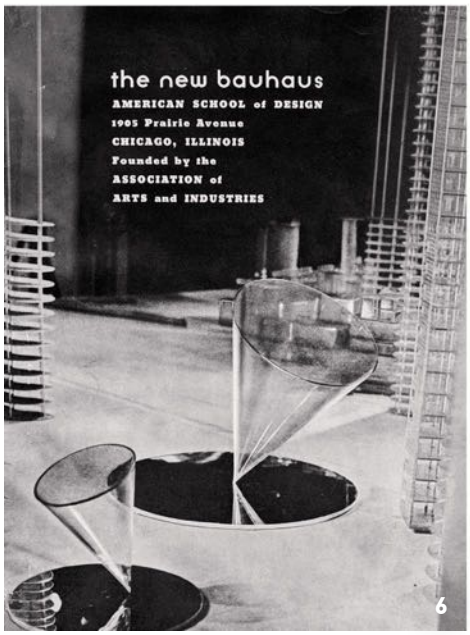

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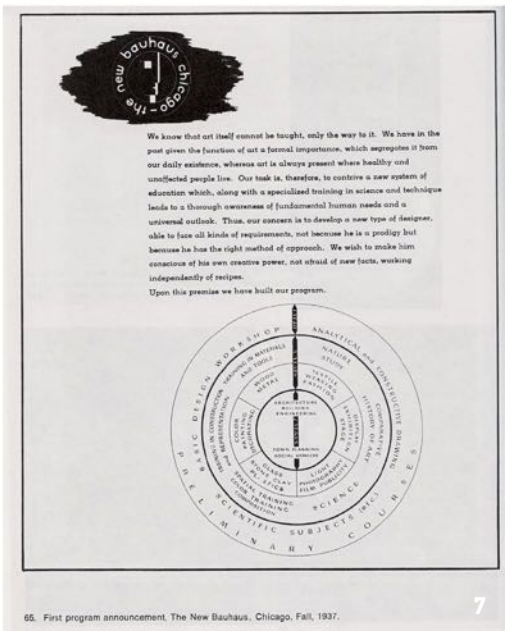

65. First program announcement, The New Bauhaus, Chicago, Fall, 1937.

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Fig. 4: Ludwig Mies van der Rohe's notes for his speeches. Credit: Ludwig Mies van der Rohe papers, Manuscripts division, Library of Congress, Washington, DC.

Fig. 5: Mies van der Rohe, Explanation of the Educational Program sent to Henry T. Heald on March 31, 1938. Credit: Ludwig Mies van der Rohe papers, BOX 5. Manuscripts division, Library of Congress, Washington, DC.

Fig. 6: László Moholy-Nagy, "The New Bauhaus: American School of Design". 1905 Prairie Avenue Chicago, Illinois. Founded by the Association of Arts and Industries, Chicago, The Dartnell Press 1937. Dimensions: 33,5 x 25,5 cm. Designed by L. Moholy-Nagy).

Fig. 7. First brochure of the New Bauhaus. Source: Halluta Moholy-Nagy Collection.

entitled "Intellectual Integration" at the New Bauhaus, remarked, regarding Moholy-Nagy's interest in "the unity of life" in the prospectus for the New Bauhaus: "*Moholy-Nagy knew of the interest of Rudolf Carnap and myself in the unity of science movement. He once remarked to us that his interest went a stage further: his concern was with the unity of life.*" [18]

An enlightening text regarding the relationship between the teaching approaches at the Bauhaus and the ideas of logical positivism is Peter Galison's "Aufbau/Bauhaus: Logical Positivism and Architectural Modernism", in which the author interprets both logical positivism and Bauhaus as "attempts to interiorize an image of the machine world [...], one through language, logic, and thought, the other through color, geometry, and architecture". Galison also argues that "the New Bauhaus imported the Vienna Circle's logical positivism as a fundamental component of its basic design program" [19]. The fact that the geographical trajectories of certain major figures of both the Bauhaus and logical positivism coincided – given that they emigrated to Chicago during the same period – contributed to the intensification of their exchanges. Carnap, for instance, settled at the University of Chicago in 1936, a year before the arrival of Moholy-Nagy in Chicago. The recruitment of several members of the positivists' Unity of Science movement to teach at the New Bauhaus further reinforced the cross-fertilisation between logical positivism and arts education.

Moholy-Nagy was much influenced by American pragmatism, and especially by John Dewey, a leading proponent of the American school of thought known as pragmatism. Dewey's book entitled *Experience and Education* (1938) [20], which the author himself had offered to Moholy-Nagy shortly after its publication when the two men met in New York for first time, played an important role in shaping Moholy-Nagy's teaching approach. In parallel, in the New Bauhaus curriculum one can discern several ideas that bring to mind Dewey's *Art as Experience* (1934)[21], such as the concern about process-oriented education. Moholy-Nagy's interest in the concepts of experience and "self-experience" could be interpreted as an expression of his attraction to Dewey's approach. Dewey's understating of "situation" and Moholy-Nagy's intention to enhance the conditions that would permit to conceive education as a prerequisite for changing society are close.

Another connection that should also be highlighted is that between Raoul Heinrich Francé's work and Moholy-Nagy's approach [22]. The former, who was a renowned Austro-Hungarian botanist, microbiologist, natural and cultural philosopher, developed a reflection on how the biotechnic principles could be applied in the fields of art and engineering. Francé's concept of *biotechnik* as well as his understanding of the so-called "objective philosophy" had an important impact on Moholy-Nagy's pedagogical vision. A work of Francé that had a significant impact on Moholy-Nagy's biocentric vision is *Das Buch des Lebens* (*The Doctrine of Life*), which had been published in 1924 [23]. Moholy-Nagy's understanding of architecture as "an organic component in living [and] as a governable creation for mastery of life" brings to mind Francé's biocentric approach, as does his conviction that "architecture will be brought to its fullest realisation only when the deepest knowledge of human life in the biological whole is available" [24]. Moholy-Nagy's holistic biocentric approach could not but be related to the broader context of the so-called *Lebensphilosophie*, and its emphasis on the meaning, value and purpose of life as the foremost focus of philosophy. Moholy-Nagy's pedagogical

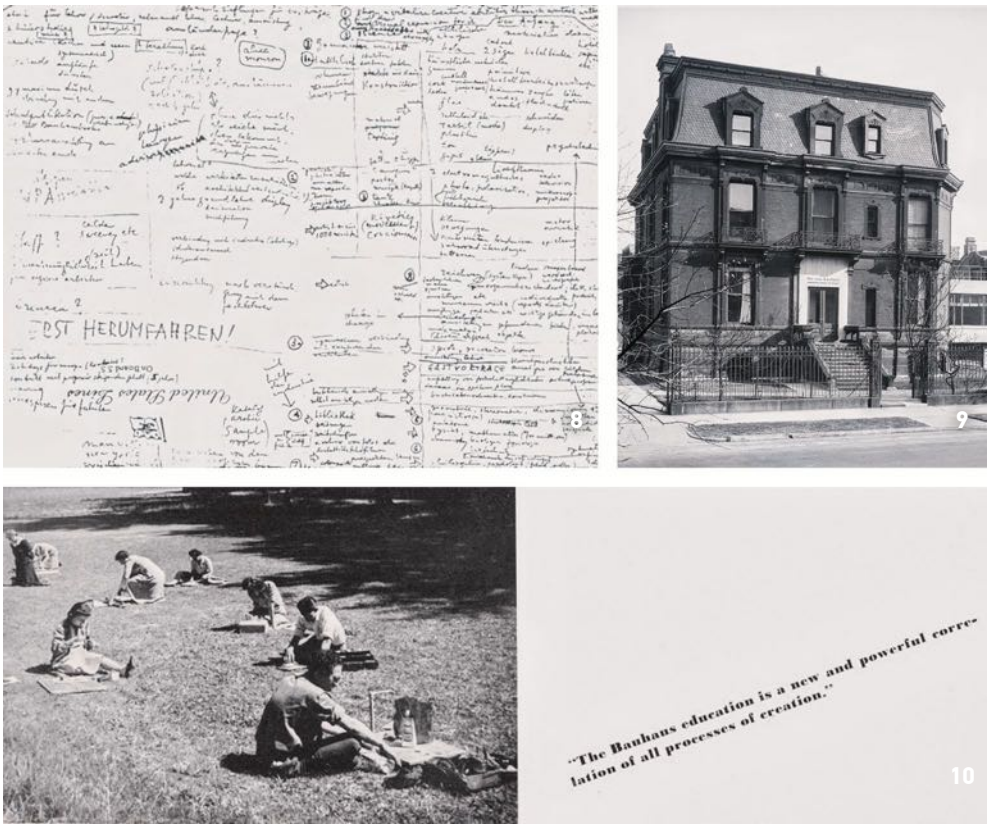

Fig. 8: First draft of New Bauhaus curriculum, prepared by Moholy-Nagy while crossing the Atlantic, August 1937. Source: Halluta Moholy-Nagy Collection.

Fig. 9: Marshall Field's former mansion served as the New Bauhaus, Chicago, Illinois. Bettmann Archive. Source: Bettmann Archive.

Fig.10: Brochure, School of Design, 1941. Source: Artist files. A0008. Solomon R. Guggenheim Museum Archives, New York, NY

approach at the New Bauhaus, the School of Design and the Illinois Institute of Technology (IIT), was based on his vision of pursuing a new way of life, as expressed in the following words: *"It is the artist's duty today to penetrate yet-unseen ranges of the biological functions, to search the new dimensions of the industrial society and to translate the new findings into emotional orientation. The artist unconsciously disentangles the most essential strands of existence from the contorted and chaotic complexities of actuality, and weaves them into an emotional fabric of compelling validity, characteristic of himself as well as of his epoch."* [25]

According to Joseph Malherek, "Moholy [...] based his pedagogy on a coherent, well-articulated Weltanschauung" [26]. "Weltanschauung" is a concept fundamental to German philosophy, especially to epistemology, and refers to a wide world perception. Moholy-Nagy's holistic approach becomes evident in his following words: "It is astonishing how differentiated knowledge can be in spite of a generally similar educational and social background. By directing interest to commonly accepted tasks and problems, this varied knowledge of the experts could easily be united and synthesized into a coherent purposeful unity focused on sociobiological ends" [27]. As Victor Margolin underscores, Moholy-Nagy's efforts to establish a pedagogical agenda at the New Bauhaus and the School of Design in Chicago were characterized by a tension between "his vision of a holistic and humanistic European art and design", on the one hand, and "the pragmatic expectations of the American businessmen on whose support he depended" [28], on the other hand. Hattula Moholy-Nagy, László Moholy-Nagy's daughter, has interpreted the difficulties her father faced as Director of the New Bauhaus and the School of Design in Chicago as a result of the perplexities related to the necessity "to adapt [...] to the culture and social structure of a country considerably different from any of the European lands with which he was familiar" [29].

A point of convergence between the Mies van der Rohe and László Moholy-Nagy's pedagogical agendas was their insistence on the understanding of education as a process that shapes one's own way of conceiving life. Their perception of the process of teaching had an existential value that one can only grasp when diving into the guiding principles of both Mies and Moholy-Nagy's understandings of the praxis of creation. In parallel, they both perceived education as a transformative experience. The evolution of the individual through the pedagogical process was at the heart of their thinking, and their conception of pedagogy could be described as process-oriented. One could claim that the models of education promoted by both Mies and Moholy-Nagy are characterised by a desire to bridge the humanistic anti-materialism that characterizes Goethe's approach with Dewey's perception of education, which places particular emphasis on the importance of experience for the shaping of one's world view.

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Primary Architecture

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Abstract

There are many ways to form architectural space. This paper describes various approaches to the teaching of the subject "The Fundamentals of Architectural Design". The methodology of Primary Architecture is based on the Swiss model of Pierr von Meiss [1] and was further developed at FA BUT at the Department of Spatial Design and Department of Experimental Design. The main aim of the course is to provide first-year students with experience in spatial design using two different sculptural methods (addition vs substraction) and applying them to different spatial principles (Raumplan vs Plan Libre). The next part of the methodology is the stimulation of students' abstract thinking (the transcription of a graphic or literary template into a three-dimensional composition). There is particular emphasis on the presentation of the project itself (inhabiting the space and presentation with hand drawings). The aim of this presentation is to re-open the discussion on the key creative possibilities of an architect. The paper deals with individual aspects of architectural design and their verification through design and physical modelling. The results of the Primary Architecture course are subsequently used as source materials for further design projects. The main goal of the course is to ask what is the foundation stone of contemporary architectural spatial design. Despite the general formulation of this question, the methodology of Primary Architecture is aimed at the examination of specific aspects, such as composition, light, materials, the atmosphere of a place, function, significance, symbolism etc.

Keywords

architectural education / basics of architectural design / Z generation / current methods of educating architects

1. Who is learning?

Before we address the question of HOW to teach architecture in the first year of university studies, we need to realize WHO we want to teach. What kind of student faces us? This topic touches not only on the usual generational exchange, but is also related to the rapid development of information technology, which affects the traits of students entering the university education process. So, who are the Z generation, how do they see the world and in particular how do they learn? This generation, born between 1995 and 2010, lives, according to Noreen Hertz [2], in a world of media, technology and a wealth of data. It is growing up against a backdrop of turbulent and highly publicized events (economic and environmental crisis), which raises concerns about the future and foments general mistrust of the government, larger corporations and institutions themselves (such as universities).

Adam Renfro characterizes this generation as the first to be born into an Internet-connected world and therefore extremely flexible, resourceful in the use of digital technology and also intelligent (their IQ is on average higher than that of the previous generation). [3] In the educational process, universally valid theories and their technological applications are questioned by young students. Petr Zappe draws attention to the ubiquitous interaction of the Z generation with social media, which negatively affects their interpersonal skills on the one hand, but on the other hand teaches them to cope emotionally with the permanent pressure of large amounts of synchronous information. During their studies, students are not distracted, but they have a so-called "rapid focus", with which they are able to concentrate well. Within 8 seconds they can decide whether or not the information offered will benefit them. When the educator arouses their interest, he or she is no longer a coordinator of their interest. Students want to learn new ways and be part of their creation. The emerging generation no longer wants to be a passive recipient of information, but to participate directly in the learning process. The educator they respect is not necessarily infallible, but open and authentic. [4]

Ivan Horký also draws attention to the change in the traditional role of the teacher, which is increasingly shifting into the position of mediator of information and initiator of study activities. He describes the contemporary student as capable of searching for and obtaining information, but he sees their weakness in the sorting and assimilation of acquired information and sometimes in the inability to put it in the right context and category of meaning. Horký describes a move away from the straightforward rationality of the modernist perception of the world: "While the generation of parents of today's students, and even more so of the generation of university teachers, built their knowledge on three pillars, reading, writing and arithmetic, today's students build their knowledge on six completely different pillars: communication, cooperation, computing, computer literacy, creativity and critical thinking." [5]

Pierre von Meiss identifies a loss of complex vision in his students, probably due to the advent of CAD technology. He, therefore, draws attention in the architectural design teaching process to one of the key educational goals: to teach students not to distract their attention with details, but to see the whole. [6]

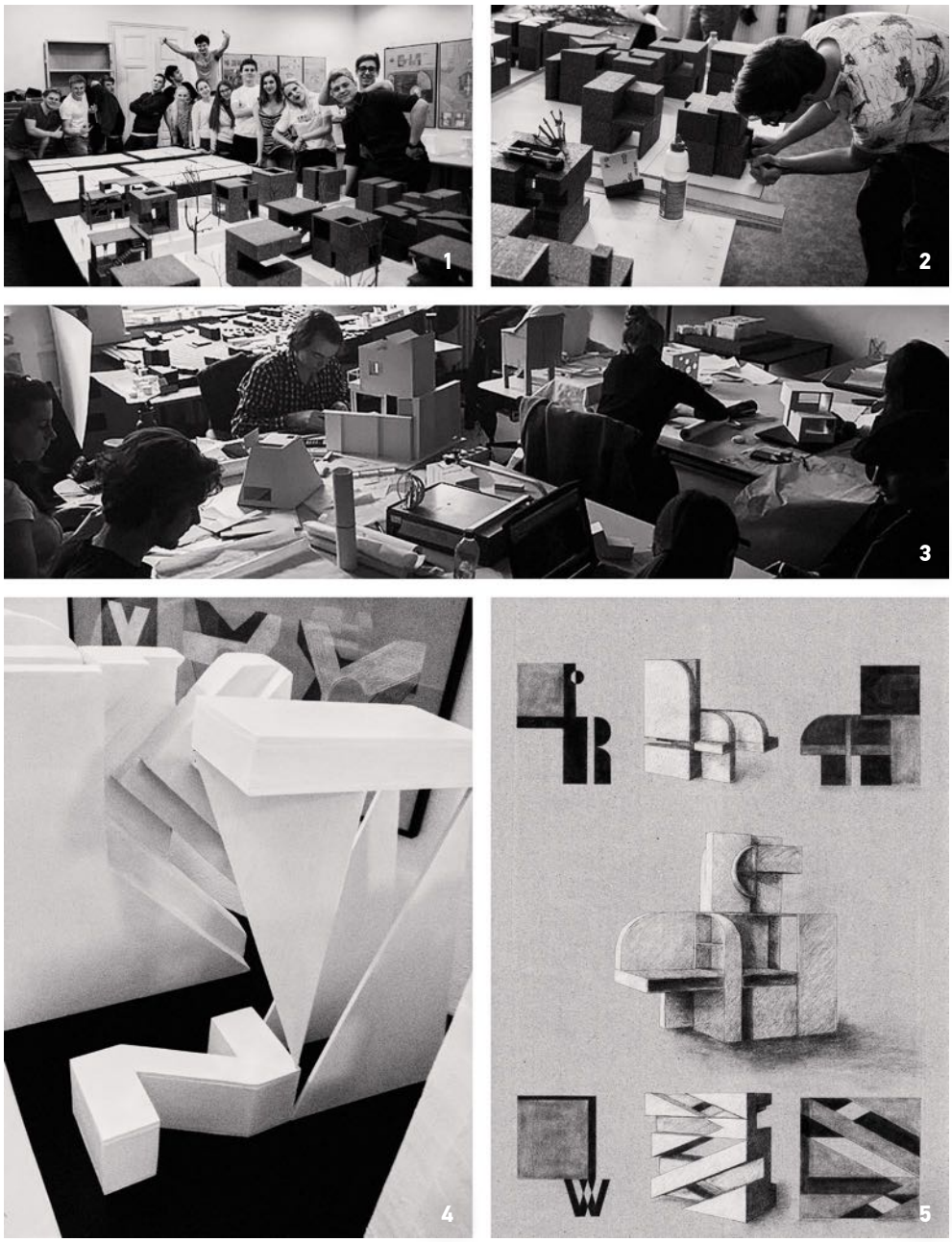

Fig. 1: First Year Students, Basics of Architectural Design (ZAN), Studio Ponešová / Foretník, 2017 (Ondřej Zavadil)

Fig. 2: Basics of Architectural Design (ZAN), Studio Ponešová / Foretník, 2017 (Ondřej Zavadil)

Fig. 3: Basics of Architectural Design (ZAN) at the Departments of Experimental Design, Studio Gale / Sládeček, 2018 (Nicol Gale)

Fig. 4,5: Outcomes "Live Alphabet", ZAN 2018 (Barbora Ponešová, Bevelaquová Diana)

In connection with the progression of the so-called Generation Z into higher education, it is necessary to re-evaluate existing teaching methods. In particular, the traditional concept of information flow, which ceases to be strictly one-way, should be reassessed. Lectures should allow students to be involved in the discussion. Horký stresses the need for added value, which he sees in the explanation and illumination of the subject matter from various aspects, in the explanation of practical meanings or impacts, and in particular in the evaluation of the context by the teacher. The learning process in general should reflect students' interest in the practical use of the information obtained. The theoretical and design part of education should also include case studies with examples of the impact of designs, illustrating reality from various aspects and perspectives. In the course of study, more and more emphasis should be placed on information gained through experience rather than the memorization of data, and there should be emphasis on teamwork that is close to current design practice. According to Horký, contemporary postmodern education is about the construction of knowledge and not about its reproduction. Adam Renfro aptly compares the future model of education to computer games: the education process generates a continuous flow of data, continuous feedback, defines clear challenges, goals and rewards. Renfro also points out what the universities themselves have already started to recognise: that the gap between that which schools teach and the skills required by the new generation is widening. This is one of our key motivations for looking at the re-definition of the educational method used in teaching foundations of design at architecture schools.

2. How do we teach today?

2.1. The concept of teaching at FA BUT

The history of teaching the fundamentals of architecture and the fundamentals of architectural design at the Faculty of Architecture of the Brno University of Technology has a long tradition, based on the principles of modernism. The foundation of the faculty itself dates back to the interwar period (after 1919), when the international avant-garde movement was established. Thanks to its geographical location, Brno absorbed influences from both the West German BAUHAUS School, and the Moscow VCHUTEMAS School. The atmosphere of the academic environment and the city as a whole was favourable for the development of modernism, whose strong legacy is still present in the whole concept of teaching.

The Faculty of Architecture in Brno takes much of its prestige from the functionalist era. A number of prominent personalities of the modernist movement (Jiří Kroha, Bohuslav Fuchs, Bedřich Rozehnal and others) took professorships there. Another advantage is its relatively small size (approx. 500 students), while at the same time being part of the University of Technology in Brno, which provides it with a stable position within the European Higher Education Area (EHEA).

Taking into account the modern history of the faculty (after 1989), when a new concept of architectural studies was adopted and a two-stage model of study was introduced - bachelor's

and master's, then we can say that teaching is continually guided within three basic groups of subjects. These courses are currently taught across the whole tutor group and cover the basic disciplines of architectural education. From the second semester, compulsory courses are supplemented by the core subject of study - studio design - as a subject students must take choosing from many options.

With regard to the nature of the student's abilities, the accredited study program at the BUT FA recognizes technical, theoretical and imaging subjects. While individual categories of subjects focus on a certain component of the student's abilities, they can develop a variety of skills. [7] The division of the subjects in the three categories above corresponds to the educational objectives of the faculty.

The definition of an educational goal as it is generally understood is to achieve a certain state of mind and a change in the personality of a pupil [8]. This aim is to be achieved by developing three complementary abilities of a student: cognitive, affective (value based) and psychomotor. At the same time, these objectives should be consistent (goals hierarchically lower should be subordinate to higher goals and help to achieve them), adequate (demanding but at the same time achievable), unambiguous and controllable. [9]

With some degree of simplification we can say that technical subjects develop mainly cognitive abilities, theoretical subjects are mainly focused on affective abilities and imaging subjects are aimed at improving the psychomotor skills of students.

Apart from all these subjects stands the design work itself, where a student deepens all the above mentioned abilities - cognitive, affective and psychomotor.

In order to determine the continuity of the curriculum with regard to its difficulty and to plan and control the learning objectives, the taxonomy of educational objectives is applied. Jaroslav Vávra [10] describes individual models: For cognitive goals, Bloom's taxonomy of cognitive goals [11] or Anderson's and Krathwohl's revised Bloom's taxonomy [12] are used today. For educational affective goals the Krathwohl taxonomy [13] and for psychomotor goals the Simson taxonomy [14] are used.

The question is, which taxonomy to use in the case of studio teaching in connection with its holistic character? Trum and Bax modified Bloom's taxonomy for architectural education in their work on research on architecture concepts [15]. In the hierarchy of the learning process itself, they copy Bloom's pyramid; their work focuses more on the characteristics of the individual phenomena they define. In this context, the so-called New Taxonomy, presented by Marzano & Kendall [16], seems more appropriate.

According to Vávra, their Model of Behavior is aimed at students themselves. It is a metacognitive system in which students set goals and strategies, as well as a cognitive system in which they process relevant information. One of the goals of Marzan & Kendall was to integrate cognitive, affective and psychomotor goals into one model. That is, the model allows for a hierarchical approach from the Retrieval level to the Self Belief level, all three spheres being parallel. This method is typical for teaching studio work and for teaching the foundations of architectural design.

2.2. Methodology of studio teaching at FA BUT

In terms of the development of the pedagogical model (generally) we distinguish between two opposing positions: on the one hand there is a traditional concept (instructivism) and on the other there is a modern approach (constructivism). Rohlíková, Vejvodová describe the differences between the two models as follows: Instructivism sees learning as a linear development of knowledge. The student is expected to master theoretical information and acquire habits by practising. Constructivism, on the other hand, regards learning as a deeply individual process and emphasizes that knowledge and reality have no objective or absolute value. [17]

Constructivism seems to be a suitable model for studio teaching at the Faculty of Architecture, because of the unique and irreplaceable individual experience of students. They are acquainted with various theories and on the basis of active discussion with teachers and classmates, critically (re) evaluate their original views and build their own and unique structure of knowledge and attitudes. Rohlíková, Vejvodová state that the methodological basics are: learning through activity, experiential learning in a real context and self-reflection. Emphasis is placed on the social dimension of education (shaping one's own views in confrontation with others). In doing so, the constructivist concept does not exclude instructivism where it is appropriate and desirable, in the educational process. [17]

In the course of studio teaching at the Faculty of Architecture at the Brno University of Technology, a shift from so-called "master studios" to a model supporting individual student approach (constructivism) has been observed in the last 20 years. The subject "basics of architectural design" is a foundation design course, taking place in the second (summer) semester of the first year of the bachelor's degree program and following on from the Basics of Architecture module. Master studios (also within the ZAN model) were led by a distinctive personality and the teaching process was based on the acceptance of the value system and imitation of the skills of the tutor by a student. At present, on the other hand, the design courses have a tendency to develop key competencies and independent thinking in students. In design courses, the need for a two-dimensional nature of education should be emphasized. Studio work integrates both theoretical (critical) and practical (skill) dimensions. The learning-by-doing approach is used for the skill concept. According to Vízková, the concept of learning by doing develops those competencies that are neglected in theoretical preparation: expressive skills, creative and critical thinking, team collaboration, group coordination, work under time constraints, the need to explain one's own views and progress, and last but not least, the active use of new technologies. This practically-focused teaching is typical of the USA model and falls into the category of what is known as experiential learning. [18]

The close relationship between practical experience and effective education has been described by John Dewey, and based on his theory, Edgar Dale has created a so-called cone of experience that depicts the relationship between the teaching method used and the effectiveness of teaching. It shows that 90% of the information the student remembers comes from real activity, imitation of experience and presentation, ie what we do and say [19].

The method of Basics of Architectural Design (in Czech Základy architektonického navrhování - ZAN) occupies an exceptional position among other design courses. It is the first lesson with an emphasis on architectural design experience. During this course, students are confronted for the first time with the design process, while integrating the level of knowledge and practical skills they acquire in a relatively short time prior or in parallel with the course. In the structure of studio teaching it is a kind of initiation course in which a student acquires the key concepts of creating space. Currently, this subject is taught using several different methodologies. The teaching methods described below are the basis for the principle of teaching the Basics of Architectural Design (ZAN) at the Departments of Spatial and Experimental Design, in the studios led by Ponešová / Foretník and Gale / Sládeček, which we present here under the name Primary Architecture.

3. Primary architecture

The ZAN teaching method is developed on two levels. The first is the content of teaching itself, the second is the chosen methodology with regard to the changing character of the younger students (generation Z).

3.1. Content

The content of tuition is chosen according to the educational goal, which is the ability of the student to distinguish and use the basic principles of composition, defining the concept (story) of the building, mastering a simple typology and the context of the site and the final presentation of the design. In accordance with the above goal, the work is divided into several smaller, consecutive tasks: Story, Shape, Inhabiting, Context and Presentation. Two different, usually opposing, options are examined. Students try different approaches to design and realise that there is no single right solution. During their work, they have the opportunity to test their own affinity for different design methods.

Story

The aim of the introductory task is to find inspiration in other fields and to develop abstract reasoning, uncovering the inner structure of the image, literary text or marginal architecture, naming and working with compositional principles, searching for poetics, transcribing the story into space. The first task is to deepen students' abstract thinking, to stimulate their imagination and to develop the ability to transcribe a certain meaning into matter. Over the past four years we have tried various sources of inspiration: abstract painting, photomontages, poems and stories. Svatopluk Sládeček uses as inspiration „low" architecture, structures standing on the periphery of our interest: courtyards - the dirty insides of the cityscape, extensions, shelters, sheds, barns, cabins. This gives the design a storyline, which in normal practice is provided by the place itself and the client.

Shape

Students are given a predetermined volume (in the form of a cube, prism or cylinder) and are given the task of shaping the inspirational story into a physical model. This phase is intended to teach students to create spatial composition in two different ways: addition (by adding mass) or subtraction (by removing mass). At the same time, students utilise two spatial concepts - Raumplan and Plan Libre [20]. Students develop two spatial compositions into two different spatial forms. From the beginning, only working models are consulted. During discussions that are held with the whole group, the model may become deformed or rebuilt if necessary. This phase is a live process corresponding to the Learning by Doing method.

Inhabiting

Students "inhabit" the proposed spatial compositions with a simple typology - usually on the scale of furniture and a small dwelling. At this point, the students gain experience looking at the relationship of a particular spatial form to function. Although in standard practice the function lies at the beginning of an assignment and a suitable shape is sought for it, in this case the chronology is intentionally reversed. Based on the chosen spatial composition (Raumplan or Plan Libre), the student can literally "get in touch" with the function that is more or less suitable for the spatial form. At the stage of „inhabiting", students encounter a relationship of the basic anthropometric necessities and spatial possibilities of the composition. The educator corrects the process with information about the recommended dimensions for the selected function and explains the legislative background. Often students work by trial and error and try out more functions before they find the one that is most appropriate.

Context

In the next phase, students impose the proposed spatial composition on a specific environment and explore the nature of the relationships that an architectural object can have with its surroundings. Again, the inverted principle is used as compared to standard practice. The point is to observe, realize and define the nature of the relationships between the house and the landscape, between the interior and the exterior. The students are acquainted with the basic nature of relationships, the way in which the architectural object can behave in relations to its surroundings. The tutor introduces students to the theoretical principles of "object - anti - object" [21] and principles of "glass - clay" [22]. This is particularly challenging for students.

Presentation

At the very end, students learn to present their designs graphically. They work out schematic floor plans, sections and views of the selected composition and supplement them with an axonometric projection or perspective of the whole and the interior. All work is done manually, without a computer. When drawing, students use working models which they illuminate with light and observe the interesting aspects that light modelling brings into space.

Fig. 6: Outcomes ZAN 2019, Studio Ponešová / Foretník (Barbora Ponešová)
Fig. 7: Model, General Urbanism, ZAN 2017 (Ondřej Zavadil)
Fig. 8: Interior Drawing, Lighting Study, ZAN 2017 (Ondřej Zavadil)
Fig. 9: Exhibition "Live Alphabet", Mini Gallery, FA BUT, Brno, 2018 (Barbora Ponešová)
Fig. 10: Workshop for primary school at FA BUT, 2017 (Igor Serenčko)

3.2. Methodology

The methodology itself is based on the pedagogical model of constructivism, with a distinctly individualized form of teaching and the active role of the student. At the same time, it aims to develop students' cognitive, affective and psychomotor abilities (multitasking). Direct experience is emphasized, using the learning by doing method. Compared to the methodology of master studios, it is more adapted to the needs of the incoming Z generation, especially in dividing the process into a number of smaller tasks with clearly defined outputs. Experimenting and testing (trial-and-error) are allowed when designing. Students are perpetually faced with new inputs and new information that hierarchically develop the original phases of the assignment. Ongoing consultations ensure constant feedback. Experience is gained by directly verifying different approaches, giving the student a choice. The students thus acquire a model of behaviour in addressing the key moments of architectural design and are led to actively seek their own approach to creation.

4. Conclusion

The method described above has been practised in the last four years at the Institute of Spatial and Experimental Design, in the studios Ponešová / Foretník and Gale / Sládeček. It is based on models of teaching at FA BUT, which were developed with regard to the educational needs of the youngest generation. This method is continually tested in a simplified form with primary school pupils at various workshops or public events. It is noticeable that many of the outputs of younger pupils are at a relatively high level and in some respects are comparable to those of first-year students at the Faculty of Architecture in Brno. There is a growing interest in architecture among children and the general public. Our wish is to continue these activities and to develop a lively creative environment within the ZAN classroom.

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Education as Transition

Practices of Teaching 1st Year Design in Architecture

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Abstract

"The beginning is said to be half of the business" (η αρχή είναι το ήμισυ του παντός) claimed Aristoteles (Politics: 1303b 29). The initiation to Architectural Design equals to an actual invitation to a mission to save the world, to change the world, to be part of history that has not been written yet. By realizing a project we influence people and guide their emotions, their relationships, their thoughts; and we provide the practical basis for theory, for philosophy, and a prime field for developing technology. By pointing out their eventual role and their potential impact on the lives of lots of people, we imbue students / architects-to-be with tension and a sense of responsibility so that they feel compelled to pursue knowledge in the most diverse fields, and to strive to conduct their business with the highest moral standards, just as Vitruvius urged us. An in-depth reading of the world provides the means to represent its most essential features and meanings in the way Leonardo did. Therefore, pointing out the importance of initiation into the magic of the world, and requesting that the freshmen students present their knowledge, their feelings, and their personal experiences on paper should be central in the first-year curriculum at Schools of Architecture.

1. How to be a better person, a better student

By initiating our freshmen students into the miracle that is architecture, and the mission it accomplishes, and the duties it has towards its audience and users -since we play God designing new worlds and offering its inhabitants new experiences and manipulating their relationships to each other- we should be aware that we need to keep up to date this God -ourselves.

People at the age the majority of freshmen students are, are more or less simultaneously free of prejudices and biases, and locked-up in the role imposed on them of good kids waiting for clear instructions.

They have wings, but don't realize they do; and they have no clue how to use them, or they are scared to use them. We should encourage to use them, and reminding them that *with great power comes great responsibility* - a dictum that dates back to at the latest the French revolution, and the early 19th century British political rhetoric (Convention Nationale 1793; Habeas Corpus Suspension Act, 1817): responsibility requires an emotional responsive attitude and empathy, not a detached approach and apathy; deep knowledge of a variety of subjects from psychology to cultural theory, not solely technical skills; and an ethical stance in the designing process and everyday business**.**

Acquisition of abilities is not accomplished by reading a manual or taking shortcuts; it is time-consuming process requiring from the very beginning practice and critical thought. Mastery of architecture can be developed through ongoing discourse, when its products are constantly put under scrutiny. The architects work has to be subjected to questions so that criteria can be developed it can be measured against.

Consequently, the imperatives of a successful and meaningful first year design studio can be categorized as follows.

1. Integrated knowledge of different subjects. Such knowledge, should constantly be updated and should be used to dissect reality in depth. Geometry, music, theory of architecture and history of art, cultural anthropology, philosophy and psychology, have much more in common than hits the eye at first glance. Architecture cannot be "measured" if there are no other "measures" it can be set against.

2. Awareness of the significance of architecture. Architecture is a serious business affecting the well-being of people and the budgets of nations. Still it is worth making it enjoyable.

Architecture is representative of the society of that place and that time, and as such it is resilient; it acts through history as a model for new projects that will help configure and transform the society in the future.

3. Experimentation. Experimentation with new forms is one way to make architecture enjoyable. Sophie giraffe, a toy popular with kids, visualizes this objective. Kids obviously appreciate its soft texture, and its flexibility: it can be bitten and tasted, and reshaped, which apparently gives them a sense of control over it, but not easily destroyed -it doesn't matter

how many times it is twisted and bent and squeezed, the giraffe is always on her feet, as if it were new -the lesson is that when playing with shapes while working on a model we should notice the steps we are taking, so that we are able to go back to the one that still appeared, for any possible reason, as the most promising. (Fig. 1)

4. Playing like kids. Kids are very serious when playing, but can still accept missteps far better than grown-ups -and consequently are able to learn from mistakes. On top of that, kids know their position. They always ask if they can put their own creations in the museum they visit; they know that in the playground there are rules- in contrast to most architects and other artists audaciously disregard.

5. Fall in love with the project they are working on. Students must develop a relationship to the object they design; a relationship of persistence and passion and, at the same time, of comprehension. And be guided to expose their object of love to others to admire it, and to be able to soberly hear their opinion, openly, as if it was about somebody else's love affair; and to look deep into the eyes of the building they are falling in love with, so that they can come into contact with their own soul, and the soul of others around them.

Students should learn to develop criteria by which they would check their projects -if these are really beautiful, but also, and vastly more crucial, if we really need them, and why. (Fig. 2)

6. Appropriation of the project.

Appropriation forges powerful ties.

"Come and play with me," proposed the Little Prince. "I am so unhappy." "I cannot play with you," the fox said. "I am not tamed." "What does that mean–– 'tame'?" asked the Little Prince. "It is an act too often neglected," said the fox. It means to establish ties. If you tame me, then we shall need each other. To me, you will be unique in all the world. To you, I shall be unique in all the world..." "You are not at all like my rose," he said. "As yet you are nothing. No one has tamed you, and you have tamed no one. You are like my fox when I first knew him. He was only a fox like a hundred thousand other foxes. But I have made him my friend, and now he is unique in all the world." And the roses were very much embarrassed.

"You are beautiful, but you are empty," he went on. "One could not die for you. To be sure, an ordinary passerby would think that my rose looked just like you—the rose that belongs to me. But in herself alone she is more important than all the hundreds of you other roses: because it is she that I have watered; because it is she that I have put under the glass globe; because it is she that I have sheltered behind the screen; because it is for her that I have killed the caterpillars (except the two or three that we saved to become butterflies); because it is she that I have listened to, when she grumbled, or boasted, or ever sometimes when she said nothing. Because she is my rose.

And he went back to meet the fox. "Goodbye," he said.

"Goodbye," said the fox. "And now here is my secret, a very simple secret: It is only with the heart that one can see rightly; what is essential is invisible to the eye."

"What is essential is invisible to the eye," the little prince repeated, so that he would be sure to remember.

"It is the time you have wasted for your rose that makes your rose so important."

"It is the time I have wasted for my rose—" said the little prince, so that he would be sure to remember.

"Men have forgotten this truth," said the fox. "But you must not forget it. You become responsible, forever, for what you have tamed. You are responsible for your rose . . ."

"I am responsible for my rose," the little prince repeated, so that he would be sure to remember.

(de Saint Exupery 1943: Chapter 21).

7. Aesthetical enjoyment. The issue of how to experience aesthetical enjoyment, and the nature of aesthetical enjoyment, and how to design so as to provoke aesthetical enjoyment should be dealt with exhaustibly, since architecture can and should offer such experiences to its audiences.

We experience illusion spaces by submitting playfully and consciously to appearance (i.e. to what we see), that is the aesthetic enjoyment of illusion claims Oliver Grau (2003: 17)

Who can resist quality aesthetics, even if they belong to different systems addressing different tastes? If we stand in front of a beautiful palace we are attracted to enter it. We all want to rest on a magnificent hillside. Correspondingly we discern and are attracted to these qualities in all spaces – real and virtual. These are the experiences that we want to live again and again, we revisit the spaces, we watch over and again the same movie.

Awesome view, great architecture, tasty food, paralyzing love -it is interesting to coordinate these delights. We watch the sunset with our lover on delectable journeys, we enhance love with nice meals and fine wines. Or is it that we marry in Santorini, in a nice setting, to make good what our relationship lacks?

8. Create narratives *"A strong grasp of narrative structure is as essential to a novelist as a sense of empathy and a reasonable vocabulary. The secret to a great novel isn't just what you say, or how you say it, but where it's said, and when. The way a story is structured enables a writer to build and release tension, reveal and resolve conflict, and to lead the reader from a gripping introduction to a satisfying conclusion"*, says Orange Prize-longlisted author Kathryn Heyman (Heyman, 2014).

The narrative is the most essential guide, on which the visitor is attached (or even hooked) in order to explore the environment he/she has entered. It is most important in fiction and non-fiction literature, and in story-telling, where is clearly apparent; but also –although less visible, sometimes almost non-discernable- in architecture, in theater, in music, in painting, in video-games... The TV series' seductive power is based on narrative, which is practically their only merit. Just after the war in former Yugoslavia, people in all areas of the country used to get home at 20:00 hours to watch the TV series Kassandra that was aired by Belgrade national television network.

The narrative carries in itself complexity and multiplicity. 1. It handles the guidance through the artificial environment, so that the visitor hasn't to create his/her own points of interest.

Fig. 4: George Clooney and Yayoi Kusama.

Fig. 5: This extremely rare and enchanting carousel horse by Charles W. Dare is a highly important piece of antique Americana. One of the earliest works by one of the first carousel makers.

2. It elevates or suppresses the spirit, it tires or it relaxes the visitor. 3. It connects and disconnects. 4. It binds things together and creates associations and sequences rich in meanings and connotations.

9. Design open forms. Forms who do allow for multiple readings spark interest and breed a healthy dose of anticipation -and the consequent surprise. We should leave forms unfinished, in order to leave space for fantasy. The user must contribute something to the integrity to the object, so that he/she get attached to it. Martin Heidegger has long argued against the detachment, and for the involvement with things, that allow us to dwell- which is the way people are in our world. (Heidegger 1954). This idea was adopted by phenomenological anthropology in its attempt to avoid the sharp distinction between biological process and cultural history, and show that involvement with things and making things are essential features of being human (Ingold 2000), and transcribed in economics as the IKEA effect, – a term coined recently to describe the "increase in valuation of self-made products" (Norton et al. 2012).

"So then I made a drawing. He looked at it carefully, then he said: "No. This sheep is already very sickly". Make me another. So I made another drawing. My friend smiled gently and indulgently. "You see yourself," he said, "that this is not a sheep. This is a ram. It has horns".

So then I did my drawing over once more. But it was rejected too, just like the others.

"This one is too old. I want a sheep that will live a long time." By this time my patience was exhausted, because I was in a hurry to start taking my engine apart. So I tossed off this drawing. And I threw out an explanation with it. "This is only his box. The sheep you asked for is inside." I was very surprised to see a light break over the face of my young judge:

"That is exactly the way I wanted it! Do you think that this sheep will have to have a great deal of grass?" "Why?"

"Because where I live everything is very small...

"There will surely be enough grass for him," I said. "It is a very small sheep that I have given you."

He bent his head over the drawing.

"Not so small that—Look! He has gone to sleep . . ."

And that is how I made the acquaintance of the Little Prince.

(de Saint Exupery 1943: Chapter 2). (Fig. 3)

10. Furthering the ability to fully perceive space. Such an ability is acquired through training; it requires full sensitivity and openness to every kind of emotion; it is nevertheless anchored on logic to full investigate and comprehend the mechanisms that underlay a rich perception of space. Developing a relation to the space we visit means experiencing contact, surprise, emotions, happiness. Music kind of decorates time; architecture should mimic that quality. Music sticks in our mind and is vivid in our emotional world; long after it has stopped, it's still there, it's still alive. (Fig. 4)

11. Become familiar with scale in 3d and 2d. Playing with models will help students to easier manipulate the world. However, we should also ask them to be aware of reality, of the scale of real things. The human figure can help when represented in models and drawings. If students learn to work and manage magnitudes they will be able to admire the complexity and richness of things; and they will be able to grasp a three-dimensional object and then spatially lay it out on paper. The work Yayoi Kusama, the queen of the dots, who transforms the real, 3d, world into 2d pictures makes abundantly clear the importance of this procedure.

Yayoi Kusama was born in Japan in 1929. She studied *Nihonga* painting, a rigorous formal style developed during the Meiji period (1868–1912) to deflect the wholesale influence of Western art through the revitalization of the traditions of Japanese painting and their synthesis with aspects of Western art. (Fig. 5)

12. Create balanced personalities. If we don't want to create a greedy architecture, we must not be greedy persons. We should know what is necessary and what should are priorities be, and what has to take center stage. We are not allowed to overshadow buildings which are of greater importance than we or our buildings are. Architecture often is akin to television. We see what cannot touch, and want to have it all -as we do when we eat even when we are not hungry. Our home probably hasn't velvet armchairs and doesn't overlook the ocean; it hasn't high ceilings, or the shiny marble table we suppose some banker has. By shaping nice house fronts, by configuring pleasant public spaces, we construct temporary homes, like real ones.

13. Learn to see the invisible. At any given moment we should be able to discern the hidden beauty of our surroundings, to observe the unnoticed, and reproduce the invisible; the city isn't just what can be perceived by our sight, but also what can be felt, and set our thoughts and fantasy in motion, the untold stories imperceptibly hewn on every stone.

14. Tutors should learn anew, with, and parallel to, the students, to design. No matter how much experience in design a tutor has, and how many architecture projects he/she has done they can always start from the beginning. In this way the teacher will rediscover what is important, he/she will take nothing for granted, which is the basis of every innovative approach to problems posed. He/she will take the students through the pains of design process, and guide them towards to the ever elusive goal of making good architecture. Tutor and student will both grow together and mature through that interaction. That collaboration must be true honest.

In places with intensive histories, where the city and the lives have been ripped apart, it is as if they were designing from scratch, because even if the lives of the students were not directly impacted by past events, these -having impacted the lives of their parents and the parents of their parents are carried by the city itself, on every street and on every building.

2. Conclusion: Good people will make good architecture, a better world

Pointing out the importance of initiation into the magic of the world, and requesting that the freshmen students present their knowledge, their feelings, and their personal experiences

on paper should be central in the first-year curriculum at Schools of Architecture. Our students are our future. Good people will make good architecture. As much as we grow and build them they will grow and build us. We can always learn anew how to be architects and that is what teaching architectural design should do. It is essential to keep students aware of the importance of architecture, to teach them how to percept their surroundings, how to explore shapes, in 2D and 3D, how to play like kid, but never lose their ability to critically "measure" the outcome of their work; and, also to teach them how to create objects offering rich experiences, how to aim to design environments where people will likely develop better behaviors and relationships between each other, and first of all relationships with themselves.

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1st Year Architecture Student: Recalling the Experience

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Abstract

To prepare this presentation, I tried to recall the experience of being a first year student in architecture. I still remember the difficulties I encountered. Hence, I will speak of 18 key-points, which I believe could unlock imagination and open the way to professional maturity.

The most challenging things I recall are:

- Grasping the notion of a "leading idea"
- Comprehending the dialectics of synthesis
- Working together with others and trying to agree on a common topos
- Getting across messages that tutors taught us whilst correcting our drawings
- Realizing that design is a way of thinking rather than the extravagance of a designed object
- Measuring everything with the blink of an eye
- Understanding the different scales and thus exercising the perceptive muscle to adjust to corresponding qualities
- Understanding the laws of nature and speaking about stability and feasibility
- Conquering geometry.
- Viewing life as a network
- Understanding semiotics and metaphors of design
- Cultivating sensitivity on social issues and an inclusive way of thinking
- Understanding that, architecture, because it is an art that we live in, is characterized by a high grade of responsibilities
- Seeing the aesthetic part through the ethical role of architecture and vice versa.
- Learning different ways of representing truths and realities
- Giving reason to each and every initiative and intention while designing
- Learning how to give feedback and think aloud
- Presenting and exposing own creations and supporting them in front of an audience

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1. Introduction

As the subject of this conference is initiation in architecture, I tried to remember the experience of being a first year student in the National Technical University of Greece, School of Architecture. There are many things that formed my way of thinking, which I am now able to decode and evaluate. M.Glyniadakis, my first teacher in architectural composition, told us the first day we entered class: "You are not born an architect, but you become one", a very encouraging word for young students. This presentation is also homage to my teachers, both to the ones I listened to and to the ones I read about. They gave us the supplies of architectural thinking, and pushed us to the limits of revelation of the discipline of architecture, a branch of studies which I still believe it is difficult to conquer.

2. 18-key points

I recall the difficulties I encountered specifically in architectural composition, being the core module of the studies, for we were introduced in a total new way of thinking. Thus, I will speak of 18 key-points and skills, which I believe could unlock the imagination and open the way to professional maturity and a way to become an architect. The most challenging things I recall are:

2.1. Grasping the notion of a "leading idea"

Leading ideas can be central ideas or concepts. By central ideas we imply codes that run through the wholes of architectural design processes, informing their parts and binding the solution to an initiation program and intention. Professor T.Biris detects in a central idea the birth of the identity of each architectural building. [1] (Fig.1)

On the one hand, in order for an idea to become central, it needs to be planted amid the design process and become a literal seed of the upcoming imaginational structure. On the other hand, a concept is not necessarily central, nor is it incurring the whole of a design process in a genetic manner. A concept could be an image of the world, a picture, a frame of reality or a notion, a word, anything that can motivate a mind into producing a sequence of ideas and associations. It can preserve a referential relationship to the design process, and function metaphorically through a series of transcriptions or... translations.

Literally or metaphorically, leading ideas preserve strong relationships with the design processes. These relationships, an architect must cultivate since the initiation of his architectural studies throughout his professional life, for architecture is doomed to fail "without the guidance of matrix ideas". Decorations or formal solutions will not turn into 'Architecture. [2] Scenography is not the issue, rather it is the structural.

2.2. Comprehending the dialectics of synthesis

Synthesis or composition is the interweaving of two or more discrete things in a common perspective, such as: space/time, content/context, public/private etc. Hegel supports the

Fig. 1: Leading ideas.

Fig. 2: An example for the function of dialectics.

Fig. 3: Agreement on a common topos.

Fig. 4: Adjusting the perceptive muscle to a variety of scales.

Fig. 5: Life and Design as networking.

idea of a dialectic triad, i.e. of a thesis and an antithesis that converge to a synthesis, which then becomes the new thesis to begin with.

Dialectics flourishes in a world of different points of view, producing open-end processes being kneaded by dipoles. (Fig.2) It flourishes in a branch like architecture, which firstly constitutes a constant effort to bridge its own "gap" between art and science. A.Tombazis, consulting a young architect, puts it nicely by saying: "Remember that Architecture is all about the synthesis of art and technique. [...] Throughout your life you will have to learn to live and work with a split personality". [3] Dialectics is firstly rooted in the relationship between the designer and his second-self... A young student must create room in his thought in order for dynamic dipoles, struggling and the renunciation of easiness, hence dialectics, to take place.

2.3. Working together with others and trying to agree on a common topos

Especially for a first year student, it is not easy to learn how to negotiate or retreat from a position that he supports with enthusiasm. Nevertheless, architecture is a field where revising and understanding grow and above all it is a profession that requires cooperation. No architect can or must complete his work without help. Like the conductor of an orchestra, an architect is a fully depended from other professionals. The composition cannot be "heard", if the spectrum of specializations is absent. Architectural composition is a work of polyphony. The result has to be the achievement of a common topos, i.e. an agreement. (Fig.3) Architectural composition and design is a battle field, where diplomacy, dynamism, flexibility, sincerity and respect are tested and these are skills one student must gradually obtain.

2.4. Getting across messages that tutors taught us whilst correcting our drawings

While tutors correct students' projects, students must try to follow the ways of thinking presented, receive the messages, be critical and gradually build their own architectural language. We have preferences on some teachers, but a selective mind is able to absorb, glean and distill information in favor of a positioning towards architecture that will eventually lead to a personal vocabulary and a personal architectural identity. Sometimes, silence is the best answer for it gives voice to the thing that must be heard.

2.5. Realizing that design is a way of thinking rather than the extravagance of a designed object

Although design is often used in order to describe the extravagance of some products that are highly evaluated in the market for the uniqueness of their form, commerciality is not the issue. First and foremost, design is a way of thinking and it is about the meeting of the designer with social parameters. This does not exclude the pursuit of uniqueness in design, but it is not an end in itself. Uniqueness basically stands for the recognition of social issues. Unfortunately, in a world of images, the fashionable and imaginative becomes a wrap of political issues. Design must be a conscious process and conscience is an insistent effort and a constant pursuit of advanced realization of our being as political beings. [4] The power of designing depends on the stochastic and perceptive ability of the subject, concerning its contribution to society.

2.6. Measuring everything with the blink of an eye

"It is important to calculate", says A.Campo-Baeza. [5] An architecture student gradually becomes a calculative mind, since architectural design must be accurate. It is also parametric and a matter of proportions. During the first classes of architectural composition, we were told and encouraged to walk around with a meter and measure everything, until we start understanding sizes and analogies of things. How high a table or a chair is, how big a single bed is, how high the ceiling of a house, a staircase or an elevator cabin are, how wide a door is etc. A student must be so well exercised, in order to be able to recognize things with the blink of an eye. A plaid paper he must know how to use.

2.7. Understanding different scales and thus exercising the perceptive muscle to adjust to corresponding qualities

What is important about the notion of scale in architecture isn't the reduction of actual things to a smaller size. Rather it is the scaling of experience and the understanding of quality of space in architecture. Each different scale outlines corresponding qualities and an architect's mind becomes a perceptive muscle that can grasp things both in their generality and their singularity. (Fig.4) The more detailed design becomes, the more the designer ventures to reduce the proportion between reality and drawing, and the less there is to hide. However, each scale is a framing of things, i.e. it is simultaneously an inclusive and an exclusive action. When things are put in a frame, other things are left out of it. Thus, the totality of a building's design is described through a variety of scales.

2.8. Understanding the laws of nature and speaking about stability and feasibility

In order to understand architecture, we must inhabit it. The laws and conditions of nature, i.e. gravity, earthquakes, wind, warming, water and humidity become actual restrictions for a sustainable design. To overcome these restrictions, students must cultivate common sense and knowledge for materials and their properties. These will become the practical vocabulary, with which architects try to poetically express habituation. K.Manolidis develops an aesthetic text about materials: "Stone speaks the dialect of the ground", "Brick conserves as active as it can the kind presence of the soil" etc. [6] As a student becomes more and more familiar with architecture, the restrictions of his design become the actual challenge for an upcoming excess and the birth of surprising ideas.

2.9. Conquering geometry

Above the entrance of Plato's Academy, one could see the so known label *"Let no one ignorant of geometry enter",* meaning that geometry is the way to approach the realm of Ideas, where geometry stands for measure, just and prudence. Even the mental development of a baby starts with the understanding of geometry of space. In architecture, geometry is a presupposition for the composition of space. To geometrize the world means to be able to grasp the size and form of things and make them tangible. Geometry is the actuality of architectural thinking, and the clever-making of things into facts. Moreover, the skill of becoming geometrical reveals the quality of a philosophical mind that can comprehend things

in terms of analogy, symmetry, repetition, isonomy, equilibrium, limits etc. Architectural models are important, because students investigate the tangibility of their ideas.

2.10. Viewing life as a network

"Water is the first internet of the world", R.Piano professes. [7] Today, in the Information era, networks are ubiquitous. It has become easy to access information. Exchange, transformation and comparison of things in a digital environment are possible. We participate in a global network of relationships, interactivity and mutuality and design as a language becomes an effort to expand a network of exchanging ideas and information. A city is a network. Thought is a network.

A few years ago, A.Bijl saw design as "an overall transportation system", [8] so true and important and yet quite difficult to comprehend as a first year student of Architecture. Indeed, design is a study on connectivity and a vehicle of thought going through in an overall information infrastructure. (Fig.5) In order to survive in these velocities, an architect must work like a filter of stimuli, but also become an archive machine, that collects, classifies, and finally retrieves information. His role as an archive maker contributes to the sharpening of his critical ability towards spatial, social and political components of reality. [9]

2.11. Understanding semiotics and metaphors of design

Semiology and metaphors belong to symbolic language, reaching beyond the literal meanings of things. It is a true challenge to exceed the borders of design as language, by realizing the fact that we are intrinsically involved in a game of language with specific tools and limited vocabulary. In such context, sometimes a metaphor can become more literal, than a literal meaning, as the poetic "sounds" more true than the persuasive. Students must learn how to use alternative paths in approaching truths and reality. (Fig.6)

2.12. Cultivating sensitivity on social issues and an inclusive way of thinking

To understand society, architects must think inclusively. For a sustainable design, they must take under consideration historical knowledge, social dynamics and ecological and economical balances. Snodgrass and Coyne believe that in order for the subject to be connected to the context, i.e. designer to society, design must better be described through the hermeneutical metaphor between a reader and a text. These two interact and interaction takes place inside contextuality [10], rather than outside it, as it happens when we speak of objects and subjects. In other words, a first year architecture student must start cultivating sensitivity on social issues, meaning that he must become an active part and a reader of society, in order to be able to transform things from within. (Fig. 7)

2.13. Understanding that architecture, because it is an art that we live in, is characterized by a high grade of responsibilities

"When we make architecture, at that moment we touch life and death", Prof. T.Biris says. [11] Architecture is a serious thing. Although architecture is serious, architectural design is a language game. However, between a game and seriousness, reality is at stake! (Fig. 8)

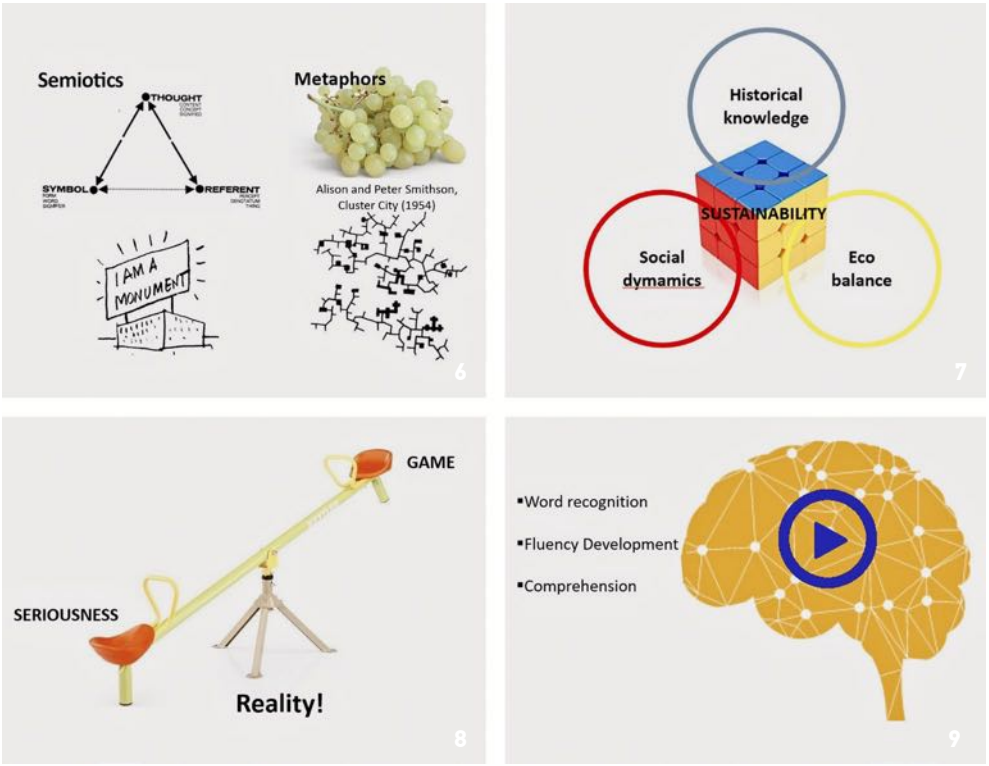

Fig. 6: Semiotics and metaphors of design.

Fig. 7: Cultivating an inclusive way of thinking.

Fig. 8: Between seriousness and game, reality is at stake!

Fig. 9: Think-aloud processes.

On the one hand, a game constructs own reality with specific rules. One who doesn't obey to these rules, destroys the illusion preserved by the game, says Huizinga [12]. On the other hand, reality outside a game is a social product, hence a serious game.

Hilde Hein professes that a game is different from reality, and that it provides a medium for escaping from it. [13] On the contrary, we argue that architectural design is a language game targeting at reality, in order to reform social "balances". This means that design is a responsible act, because it structurally interferes to social issues. Teachers must raise architecture in front of students' eyes, in order to realize the importance of their professional role towards society.

2.14. Seeing the aesthetic part through the ethical role of architecture and vice versa

As the vertical flight for seagull Jonathan Livingstone followed the lesson of a horizontal flight, so the vertical perception of things denotes an advanced spiritual situation than the one that is trapped in horizontal relationships and materiality. Jonathan says to his young students: "To begin with, you have got to understand that a seagull is an unlimited idea of freedom [...] Break the chains of thoughts and you will also break the chains of the body." The students looked at him, slightly confused. "Let's start with a horizontal flight", he says. In verticality, we detect three aesthetic categories: beauty (aesthetics), ethos (ethics) and the sublime. Beauty and ethos prepare the way to the sublime that passes through grace, as P.Michelis professes. [14] A student must realize that architecture is an expression of values. In verticality, we detect three aesthetic categories: beauty (aesthetics), ethos (ethics) and the sublime. Beauty and ethos prepare the way to the sublime that passes through grace, as P.Michelis professes. [14] A student must realize that architecture is an expression of values.

2.15. Learning different ways of representing truths and realities

The kind of architecture we produce is strongly related to the media we use in order to represent thoughts and intentions. As M. McLuhan professes, "the medium is the message". [15] Indeed, the design product derives from the semantic relationship between the designer and its medium in a world with plenty of metaphors and definitions that refer to specific contexts open to reinvestigation and reinterpretation. Revelations are yet to come, while a designer tries to find ways and exits for his thoughts. Design is therefore experimentation with different ways of investigating and expressing intellectuality and aestheticism. Representation is a process of creative mimesis.

2.16. Giving reason to each and every initiative and intention while designing

A rationale must follow a designer's intentions. Nevertheless, arbitrariness is prohibited. V.Ganiatsas professes that arbitrariness is a heresy that returns to itself. [16] A teacher must point out these differences and teach his students how to think methodologically through reasoning, associations, algorithmic logic, intertextuality and references. Structure permeates everything that is architectural, from the abstract ideas to the final detailed drawings. There is no place for the unstructured in architecture. Although the form is the quintessence of a building, architecture is deeply structural.

2.17. Learning how to give feedback and think-aloud

Architecture cannot hide. It is extrovert. It is a manifestation of logos to the public and its destination is the outside. It derives from a struggling with substance and matter, ideas and notions, language and ideologies, which must be communicated and revealed in the end, because these stories become the very essence of design, its fundament and its life-giving source. Through thinking-aloud processes, students learn how to work extrovertly. Let the student hear himself talking and feel the resonance of his words inside him. (Fig.9) This -by the teacher aided- feedback, is the base of the development of students' consciousness, i.e. of their professional identities.

2.18. Presenting and exposing own creations and supporting them in front of an audience.

Finally, the architectural design is about to be built. It will first be presented in front of an audience. The leading idea will be supported and explained. The intentions will be revealed. An idea takes the form of an argument that needs to be presented as in a structural way, as if it were a text. A. Konstantinidis said that architects must support their works both with built works and with words. [17] Students must learn how to construct their arguments. Each design must be accompanied by a side-product of thought, i.e. a text, which works parallel to the implemented.

3. Epilogue

Although architectural design is a non-univocal procedure and there are no established truths in the process of architectural composition (everything is a subject to discussion), for all the above 18 key-points, the students and future architects must be able each time to respond to how and why questions. Architecture is a demanding and living process and a journey of understanding society anew. Academic studies are the impregnation of a student with social responsibilities, ethical debt and aesthetic requirements.

Leonard Bernstein has said: "To teach is to believe in continuing. To share critical feelings about the past, all that implies a firm belief in the future." Additionally, we say that teachers must not discourage students, neither show over zeal, because it is their professional paths and calls. Sometimes, the positive surprising of a teacher from a student is the reflective reaction that is worth for 10 lessons. May the student become better than his teacher, but always remember him, because teaching is about offering, spiritual work, life guidance, motivation, keeping in motion.

Acknowledgements

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A Real 1st Year Design Course

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Abstract

Although the conference provides an array of topics, I drew inspiration from the general theme; specifically from its verbs: to initiate; and to be initiated. You initiate ON a subject but IN/INTO a secret, a society, a movement ,a cult, an organization... through something, e.g. a ritual. So what's the secret? And what is the ritual? One might say that the ultimate secret, is to learn how to ask the questions, that in our case will lead in the creation of space. And if one considers this as a valid scope for architectural education, then the ritual is none other than the didactics of design or composition or synthesis... Ten years ago, I wrote a paper on "an imaginary first year design course" and concluded that "...it is important to make students understand that the real task is to achieve consciousness... in architecture and in their lives. And to this, one has to offer only comradeship, since it is not a prerequisite for educators to have achieved it nor does it come with experience alone." Ten years after, having taught, for the entire period, a real first year design course, my goals remain the same, as far as consciousness and comradeship. What has shifted, derives directly from something that Werner Seligmann once said about the schools of architecture; that is: "...the function of a school of architecture is not primarily the production of young architects and the professional preparation of practitioners but it is the preserving and augmenting of the entire body of architectural knowledge and to pass it on..." The scope of this paper is to investigate the main tasks of a school of architecture, of its curriculum and apparently of that first in a series of educational experiences and points of architectural epiphany; the first year design course.

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Although as old as human civilization, architecture is a fairly young discipline; in western Europe, "unlike medicine, law, or theology, architecture was not born in the university of the Middle Ages, but rather in the academies of art in the Renaissance. These academies first developed in Italy as the interest in classical learning became more important and, in fact, became a formalized method of extending the apprentice system of the architect/artist." Then came its' institutionalization in France during the 17th century, and became a university department and area of academic study in the late 19th century. What we all, have experienced as architectural education falls in this context and has a history of approximately a hundred and fifty years. Within this time frame, schools of fine arts, polytechnic institutions and universities have housed departments of architecture; also associations, unions, institutes, and fellowships, followed an autonomous road and produced architectural curricula. Which of them has enabled or disabled architecture to flourish is more complicated than it seems; their common relations though can give as an understanding. To an extend all have started from the same roots as McMinn proposes: "First, it [architectural education] had taken the discipline of the Beaux-Arts, combined with the atelier system of the architect's office. Second, it formed an academic bond with engineering principles to create a university foundation for the education of the architect." In his keynote address for a symposium (in the school of Architecture and Urban Design of Kansas University in November 1990) entitled "The liberal Education of Architects", Prof. William McMinn continues with a third root that waited for the 1960's so as to appear: " It should be noted that liberal arts was not one of those basic roots. If architecture was described to be a bridge between science and art, liberal education was not required on that bridge." [1]

Now what is liberal education and how does it fit in this discussion on initiating first year students in architecture. "Although there are many interpretations of a liberal education," McMinn believes "its essence is the education that liberates us from structures of rote (routine) learning and introduces us to processes of inquiry about ourselves and the world in which we move and live and have our being." He continues: "Rather than liberal education, I submit that it is liberating education which raises the curiosity in us about the nature of the world, provides the discipline to pursue an idea, and develops the appreciation of clarity in its expression." He finishes by quoting an anonymous author who wrote: "a liberal education is what you have left over after you have forgotten everything you have learned." [2]

To talk about initiation for the first year students in architecture one might bear this last sentence in mind. Learning in the form of acquiring knowledge, does not necessarily mean understanding; in order to understand –really learn, that is– you might need to unlearn. "Initiation denotes a body of rites and oral teachings whose purpose is to produce a decisive alteration in the religious and social status of the person to be initiated." Mircea Eliade in these first introductory sentences in his book, *Rites and Symbols of Initiation*, continues defining the word in philosophical terms as "equivalent to a basic change in existential condition" where "the novice emerges from his ordeal endowed with a totally different being from that which he possessed before his initiation; he has become *another*." [3]

And it seems that what students expect architecture to be, think that they know it to be, and decided to follow it according to what they knew, is not what it is and thus their teachers feel the need to re-introduce, re-examine, and re-define, even erase it and present it anew. It might be that educators need to show students that which they think that they know by

having them see it again; through a new filter. It might be the understanding of a different kind of thinking that is needed in architecture. Actually that of architectural thinking, to begin with.

So you initiate 'on' a subject but 'in' or 'into' a secret, a society, a group, a movement ,a cult, an organization 'through something', e.g. a ritual. The Greek word that comes directly into the context of these definitions is *myēsis*. And the scope is to make the novice emerge into someone else; to become 'another'. Although we said that architecture is fairly young in academia, it brings or drags with it chains from the medieval guilds, secrets of the trade and proofs of allegiance and worthiness; but also stereotypes of how educators and education ought to be. Well, maybe not in such a dramatic manner, but nevertheless in a very different way from any other university discipline. What seems to be the target is to shake the fixed definitions of the newcomers, who in almost their entirety, don't know what is that, which they have to learn, in order to become architects.

But if this is the finishing line for every student –to become an architect- all of their academic endeavours, will prove less than enough, even if their diploma gives them the right to register in the technical chamber of their state or country and practise as architects. You see five or six or seven years are not enough to grasp the complexity of the profession. And what awaits every graduate is coping with the everyday reality, continue on other aspects of learning and enter one of the least appreciative, in relation to the intensity of their studies, profession in monetary terms. But those five or six or seven years might be something more, that definitely are out of grasp for a student to realize, right from the beginning, but it is the ethical counterweight of an education to provide. That is to assist its students to become lovers of architecture.

I will use early in this narration my *Deus ex machina*, for I think it will clear the scope of this paper. In her speech for a symposium commemorating "The Pedagogy of Werner Seligmann", in Syracuse University – School of Architecture, in 2014, entitled "Seligmann after Texas: History in the Education of the Architect", Associate Prof. Kristen Schaffer (North Carolina State University, College of Design), says that on a letter send to a fellow architect Werner Seligmann wrote: "it must be remembered that the function of a school of architecture is not primarily the production of young architects and the professional preparation of practitioners but it is the preserving and augmenting of the entire body of architectural knowledge and to pass it on. The education of the students is incidental to the main tasks." [4]

The main tasks of a school of architecture, according to Seligmann is to create an arc of architectural knowledge; update it and secure it; help it to flourish and disperse its content. What an awkward idea, one might think. You see Seligmann belongs to this group of people that understood something very important in the fifties while they were creating a new approach on the education of architects in the University of Texas in Austin. The saw that in order to make modern architecture teachable it was necessary to recognize modern architecture as a historical event and a style and thus examine its identifying characteristics, its elements, and its organizing rules, and principles. In Texas, Seligmann and Hoesli began a careful examination of the best examples of modern architecture with an extensive and detailed analysis of major modern buildings. "The espousal of space as the very substance of architecture was what made the study of the historical past relevant and such an analysis

was key. They all realized that history was an extraordinary important part of their teaching; not for borrowing stylistic elements but of finding the examples of architecture whether Modern, Beaux-Arts or Renaissance that could sustain the scrutiny of spatial analysis." [5] As Rowe had already presented in his 1947 essay on *The Mathematics of the Ideal Villa*, spatial relations existed between Corbusian and Palladian Villas. When the modern masters declared war to history, they meant the one that was copied; not history itself; not learning from the wisdom of the past.

This idea brings forth the humanistic approach in architectural education, and thus the liberal education that McMinn was talking about; by stating an older concept, where schools had to primarily assist and create lovers of knowledge, he brought on the proscenium a task for the community of a school of architecture. Thus here is the suggestion, that alters initiation tactics, curriculum and even the space of a school of architecture.

But first an antilogy...

Architectural education is a religious and tribal matter. Our schools of architecture are equivalent to theological seminars and clan settlements. We are a subculture that needs to differ, so as to prove our difference. Architecture is on a pedestal, literally and metaphorically; a God or an abstract idea. The path towards learning and understanding needs suffering, servility, blind faith, and dogma. Our famous architectural studio doesn't derive from the Latin verb *studiare*, but is just –or became– a bigger classroom with drafting tables –that accommodate laptops as well– and a higher ceiling. Initiation, therefore, is a baptism empty of message and meaning, a curriculum is an organized set of courses time and material specific, teachers stroll their geniuses around gloating on experience or academic superiority alone, and studios are empty, for the students work at home.

As close to a nightmare this is, I haven't exaggerated on all.

Architecture is not a religion. Initiating the first year students is an act of revelation, that will be repeated and hopefully understood. There are secrets and secrets; rituals and rituals. The important ones have to be exceptional and the less important, superficial. One might say that the secret of secrets –the ultimate secret in architecture– is to learn how to ask the questions, and not just answer and solve, given questions and problems; the questions will lead, in our case, to the creation of space; they will also help a young person to mature and evolve. If one considers this as a valid scope for architectural education, then the ritual is none other than the didactics of design or composition or synthesis. These are taught by educators and in this main and very essential task in architectural education they can play a number of roles. They can be fixers, midwifes, judges, coaches, instructors, leaders, guides, geniuses, arguers, fashioners, debaters, but also co-conspirators, fellows, associates, companions, comrades, partners, mates, and colleagues. They can shift from role-to-role accordingly in order to enable each student to understand. The didactics –the way that each teacher teaches– is part of a larger pedagogical concept but in almost all cases it functions on its own.

The way an educator approaches a student in their first tête-à-tête discussion on an architectural project is by far the most important moment of initiation for the newcomer. This can be the moment that he or she will understand and change. "Architecture cannot depend on formal processes of precedent or measured experimentation with codified

results. The method is imprecise, the judgement is subjective; the program or problem of architecture needs to be transcribed according to the demands of time, the complexity of the world and its society." [6] This can also happen through a network that is created in architecture schools; relations not only between teacher and student, but also between students; between students as a body and society.

Initiation is apparent and mandatory for the irrationality, confusion and contradiction that awaits students in schools of architecture. There should be activities that challenge the mind, the senses, even the body in order to 'wake up' the novices. This treasury of architectural knowledge that Seligmann proposes as the main task of an architecture school –apart from creating a plateau where all members are involved in various degrees of responsibility, that increase year by year– is its essential relation and use in teaching so as to provide a scientific body of referential material and a better understanding for the students in relation to space. This is the reason initiation can still exist today; to initiate student to the difficult understanding of space.

To perceive that the important aspect in architecture is the creation of space, the education starts with what Ruskin has called 'the innocent eye'; a perception with no signification. The need, as I said earlier, to initiate through a process of 'unlearning', is unique, not in trying to shepherd the novices into something entirely new, but to bring them back to their child innocence, where observation was key to understanding everything and where consciousness was there, evident, and unaltered as a birth right. An easy way to understand consciousness is the ability that children have to express emotion, desire and need with their whole being; without caring about what is socially acceptable. With socializing, children forget 'neverland'; they lose their ability to 'fly', since conforming to the system they will serve, requires them to be down to earth. For creative people, this has always been a challenge. So, by reminding novices that there was a time in their life that consciousness, creativity and understanding came in an unconditional, impromptu and honest manner, is of primary importance in their emergence from a high school student to an architecture apprentice.

Kazys Varnelis examines the language of space and the innocent eye as methods of teaching architectural design. Through a historical survey that includes Rousseau, Pestalozzi and Froebel, engages Ruskin, Cezanne and Kepes, walks through the experiments of Moholy-Nagy and Albers, he explains the task that the Texas Rangers undertook in order to create a pedagogy for the future architects based on these ideas. He writes in his 1998 article in the JAE (Journal of Architectural Education), under the title 'The Education of the Innocent Eye': ""The Texas Rangers promoted this kind of transcendental moment in their teaching method. Students would work hard, constantly drawing, in order to achieve the innocent eye and learn to see space. Alexander Caragonne describes the 'mysterious change of vision' that took place in the studio as an 'epiphany' to the students: 'Slowly, imperceptibly, our vision changed. We began to see the world differently. New relationships began to emerge. The spaces in between began to assert themselves, pressing forward into our consciousness. Then we were ready to begin the study of architecture.'" [7]

With Rowe and Slutzky "translating the innocent eye from two-dimensional design to three-dimensional architecture," [8] they produced the theoretical foundations for 'phenomenal transparency', the idea of understanding a building and creating space through the use of

overlapping planes –as the cubists Picasso and Braque were claiming to do in painting– started to materialize and although it has proven difficult to explain in writing, going through a series of analytical exercises, was enough, even for first year students, to begin to grasp the relations between surfaces into a dynamic play to create space. They "stripped transparency of its promise to immediate visual truth, they also reinscribed that promise at a more sophisticated level by orienting the correct perception of ambiguous space around a moment of pure vision. Clarity of sight, which it seemed they had been fighting all along, appeared in the end after all..." [9] Towards the seventies 'the innocent eye' seemed that it needed to evolve to 'a cultivated eye', but that is another story...

McMinn urges for a liberal education with a goal to equip students with such essential tools, as those one needs not to think about before using; those evident when he or she forgets all that was learned. He propagates 'the learning of architecture as a way of learning'. Seligmann offers a common denominator –the arc of architectural knowledge– as both a continuing task for an entire school of architecture, but also as an apparatus to distill history and use it to understand spatial composition through time. Varnelis describes the evolution of a thought about learning by abstraction through the use of 'the innocent eye' and its progress from a two-dimensional method to a three-dimensional process of perceiving and composing space. The Texas Rangers, first in Austin and then after their purge, in the schools they transferred (Cornell, Cooper Union, ETH, etc), produced a method that without hesitance asked question about space. Their starting point was to advance, by looking back in history. For this, they also needed to strip novices from the fad, craze and trend of architecture they had in their minds, through elements of shock, superficial hazing, exercises that seemed mundane and in situ experiences. Eliade finally informs us for that immense target: to emerge into another, new self. It is where we can bear the religious, and cult metaphor for architecture.

For all these, I still believe that an educator has to offer only comradeship to the new student...

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Temporality & Representation

Pedagogical Modalities in Teaching 1st Year Design in Architecture: Towards Cinematic Design Practice

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Abstract

In this presentation I will provide a theoretical insight into beginning design education for architecture by analysing the pedagogical modalities from the 1980s onwards. The examination of various structures, methodologies, the production and transfer of knowledge in architecture, will be exposed as pedagogical samples which problematize a context for the beginning designer to consciously experience design as an interdisciplinary category. To be able to do that, I will deal with the moving image and how it relates to designing space. As the main focus of my research, I will take a series of architectural workshops at European and US universities that perform cinematic design practice experiments. By interpreting key aspects of their methodologies for teaching foundations, the aim of this presentation is two-fold: to discuss the possibility of introducing interdisciplinary design methods in teaching 1st year design in architecture; and to demonstrate the positive principle of pedagogical change in the framework of our primarily media-saturated urban conditions of the 21st century.

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1. Introduction

Pedagogy is often reffered to as the activities of educating, or instructing or teaching, the activities that impart knowledge or skill.[2] Pedagogy is also defined as "the profession, science or theory of teaching."[3] Contemporary media-saturated urban conditions have significantly challenged the characteristics and matters that pertain to traditional pedagogy and its limitations. The rapid pace of its changing focus has urgently asked for re-identifying links with education and research, where exploration fuses with reflection and research is an instrument of discovery. Yet the representatives of the twentieth century Avant-garde art demonstrated that research and teaching create a polygon for identifying the break of traditional values. In the versions of inseparable teaching and research they proposed, the fulfillment of the architectural Avant-garde would be the total dissolution of architecture into something outside itself - of aura into mass, form into process, author into producer. According to this interpretation, the architectural Avant-garde demanded a radical challenge in how architecture is produced and consumed. The Avant-garde artist and Bauhaus professor László Moholy-Nagy was among the first to anticipate today's debates around making architecture, art, means of representation, moving images and images in general. He discovered a unique contribution of the pre-cinematic aspect of architecture through his experimental usage of then new media, photography and film, to identify the immaterial space. Both this traditional Bauhaus model and The Beaux-Arts approach to formal design education placed considerable emphasis on formal and technological aspects of architecture, which is still very much evident today. However, the knowledge appropriated through epistemological and methodological transformations towards the adaptation of the cinematic aspect of architecture still reflects limited theoretical recognition of the interpretative nature of human interaction and experiencing [1].

In the spirit of Jean-Paul Sartre's claim, "only the guy who isn't rowing has time to rock the boat," it is vital that the traditional role of the educator is broadened towards developing students' capacity to create their own insights and understandings through the design process. If research is considered the foundational component of this process, equally then contemporary architectural pedagogy inevitably needs to challenge its established thought-models. Accordingly, the paradigm of this approach is the research-based teaching which aims to provide new grounds for investigating current spatial realities, production processes and speculative futures. The hypothesis is that research-based teaching transmits theoretical foundations, introduce new thought-models in architecture and employ operative representational techniques adopted from other media, to open up traditional design education. The aim is to discuss the epistemological foundations of design education that provide understanding of how we think and produce space in our primarily media-saturated urban conditions. As first, research-based teaching will be discussed as anticipating the understanding of architecture based on students' personal experience of space: through

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2 Chapter three, final thesis: https://www.actionresearch.net/living/farren/ch3.pdf

3 The Oxford English dictionary, 2002.

movement, sensing the environment and their diverse perceptions and interactions in the context. A hermeneutic view of knowledge is applied: "the idea of knowledge as a kind of invariant artifact must be coupled with that of knowledge as dialogic with context." [2] This may mean dialoguing with the individual as a means to gaining personal insight. [3] Therefore, instead of pointing students' attention to the quality and conceptions of spaces as represented on film, the focus is rather placed on developing personal repertoire of references from film. I will deal with diverse pedagogical modalities that neglect the traditional linear trajectory of research and establish a non-linear path from historical references towards imaginative futures.

2. The beginnings and raise of cinematic design

Although a number of prominent architects contributed to professional film productions in the early 1920s, it is debatable whether any of the early film products actually informed the architectural practices of those architects involved. [4] From the historical perspective, it is worth drawing attention to the 1980s asking how the role of film as an instrument in design has changed to date. In this period TU Delft designed a course 'Environment and Psychology' taking video for exploring, analysing and critiquing an objective image of the environment instead of exposing a subjective one. The primary aim was to examine how video records of the interaction in the environment may reveal diverse modes of behaviour in urban space, in their spatial and temporal configurations. The challenge was to determine the set of principles for the development of urban space that would respond to the needs of different groups of users. Underlying the significance of this research project, TU Delft – Faculty of Architecture has established a long-term research and educational programme to investigate whether and how videography could play an additional role in the exploration, registration and understanding of urban environments. [5] The programme started with a design studio called "Camera Eye" exploring ways to apply moving images in urban mapping. The method of collecting video footage was produced with a very specific artistic approach and a clear identification of the site-specific conditions. Videography was used to create an 'objective' depiction of these urban settings. Another example is the Masterclass Media & Architecture course at The Berlage Institute (1995-96), addressing architecture and media professionals. Nevertheless, the Berlage Institute also employed video as the final form of representation.

The 1990s examples include the series of workshops in creative digital media developed and run by Maureen Thomas.[4] She deemed her workshops a necessary part of cinematic design experiments and is moving more firmly beyond mere representation. Given Thomas's concern that this kind of cross-disciplinary and convergent activities carry a high risk of

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[4] Maureen Thomas has been developing and running cross-border workshops at University of Cambridge (Architecture and Screen Media and Cultures), London (Goldsmiths Digital Studios), Ulster (Visual Arts/Design, Architecture), Bath (Architecture/Engineering), National Film and Television School in UK, Aalto Media Lab in Helsinki, Malmo (Interactive Narrativity Studio) Sweden and Norwegian Film School/Arts Fellowship Programme Norway.

indiscriminate and sometimes unfortunate intellectual hybridization when cinema enters architectural processes, her teaching approach was organized around the close relationship between epistemology and methodology. On the one hand, wandering through the filmmaker's arrangements of images, narratives and spaces, helps students comprehend more deeply the dramatic changes in how we normally see the basic architectural elements of our everyday urban environment. Thomas understands that students need to examine how a "realistic attitude to reality, the dynamism of perception and the narrativity of experience"[5] change to improve the capacities of knowledge for a new interpretation of the urban environment. On the other hand, the question of language communicated between these media was exemplified at the beginning of the workshop to embrace a grammar of space. Architectural movie clips were used to exemplify the 'screen language', and the concepts of *Plot Grammar* (the structure of the story) and *Shot Grammar* (the action staged by the director) were introduced.[6] Moving to 'screen language' required the analysis of the script and the captured material. A discussion of both theoretical issues and the practical matters of material collection and interpretation is developed. Architectural theorist Kevin Lynch's parsing of the legible city was systematically combined with traditional screen grammars. [6] New knowledge from this practice-based and practice-led approach is discovered in developing ways of observing, analyzing, theorizing, contextualizing and presenting both the objects of study and the outcomes of research.

Wim Wenders's essay on film "Like Flying Blind Without Instruments: On the Turning Point in Paris Texas" first appeared in his 1991 collection *The Logic of Images*. Film *Paris, Texas* (1984, Fig.1), like many of his films, started off with a roadmap instead of a script and worked with places which were not entered on the map. Mapping the territory and inscribing the trajectory in a zig-zag manner over the territory of Texas felt for Wenders like flying blind without instruments. He also experimented with making buildings 'real-life' objects and relating them more closely to humans. His 3D video installation "If buildings could talk" placed at the Rolex Learning Center (EPFL Learning Center, SANAA, 2010, Fig.2) in Lausanne, commissioned by Kazuyo Sejima for Venice Architecture Biennale (2010), ran in a continuous loop to unfold interactions and demonstrate this way the real nature of what humans experience while moving through spaces. In such experiential interaction, a person enters into a dialogue with the context and form different types of connections with objects and environments. The 3d film shot plays the supporting role in this method: it secures a real-life dimension of the space of "a university building in which there are no walls, just an undulating landscape intended to promote chance meetings between students and disciplines (a social education space, like Socrate's Agora but for the Facebook generation)." [7] Thanks to cutting edge 3D technology, this method responds to current situations,

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5 François Penz emphasizes the importance of introducing 'a realistic attitude to reality, the dynamism of perception and the narrativity of experience' to explain how cinema challenges the traditional disciplinary boundary of urban design, in his introduction to: cinematic urban design practice.

6 Read more about the workshop in: Maureen Thomas, "The Moving Image of the City: Expressive Space/Inhabitation/Narrativity: Intensive studio workshop on 'Continuity of Action in space," in ***Urban Cinematics,*** eds. François Penz and Andong Lu (Bristol, UK: Intellect, 2011), 281-309.

captures what is just about to happen inside buildings, the pure experience of space. This gives the impression that a viewer could walk into the screen as would enter a real physical space. From the pedagogical perspective, the significance of this method is in providing students with the opportunity to discover new aspects of the world. In these final two works by Wim Wenders we finally see a turn from the objective image of the environment towards acknowledging human experience, but film is still treated as final form of presentation.

This said, it seems almost impossible to explore architecture without film. What this historical overview also demonstrates is that in the process of education, film has been used mainly as an instrument of narration and representation. In other words, significant were the quality, conceptions, experiential, socio-cultural and political dimension of spaces represented on film or video. This was reflected in a direct implementation of the moving image on top of the techniques and methods used in these research projects. For the film not only to be the final form of representation, it is necessary to design a more open framework for working with previously collected materials. Otherwise, the results are linked only to specific site analysis. This also means that the knowledge produced in such process is not, in turn, related to its material and conceptual base in architecture. Therefore, the challenge was to find method to transfer knowledge between architecture and film. In that regard, the discussion is open to examine how might the history, theory and practice – which has long viewed architecture as a subject of rigid categories – inform the cinematic design practice to architecture. I argue that it is 'research-based teaching' that dissects the intertwined histories of film and architecture to put them together in the framework of design principles and methodologies.

3. Research-based teaching

Design as research implies the way knowledge is produced, the articulation of knowledge, and the role of educators in research. *Research* is the most radical area in contemporary education for students' acquisition of the skills, critical imaginative exploration and professional ethical development. *Research* confirms that the complexity of design activity requires examination, detection and realization, which is inherently collaborative, transdisciplinary and material, in the process of translating knowledge into architectural action. The analysis of the pedagogical modalities from the 1980s onwards is indicative of how diverse knowledge is communicated and interpreted instead of being exposed to translation in the process. More precisely, these architectural pedagogies provided transfer of knowledge between diverse disciplines in a close connection to research and education. This way, the problem related to the lack of a methodology that shares a common ground was overcome. [8] According to the results of the *Research in Design Thinking* workshop, Jill Franz (1994) concludes that the 1980s experiments allowed educators to confine disciplinary boundaries in the framework of different research models. Moreover, given that a way of communicating knowledge is crucially controlled through either theoretical or practical models, in addition it is necessary to differenciate 'way of thinking' (theory) from 'way of making' (practice). From a postmodern poststructuralist perspective, the complexity of the relationship between theory and practice does not allow for hierarchical, causal or dialectical

connections between them. On the contrary, as Gilles Deleuze proposes in discussion with Michel Foucault, the relationship between theory and practice can be understood as "a system of relays within a larger sphere, within the multiplicity of parts that are both theoretical and practical." [9]

4. Extending epistemological foundations

Architectural historian Jane Randell points to hidden danger, namely "every historical moment of analyzing the relation between theory and practice exists within the limits of a particular set of conditions." In relation to this view, the general methodological approach in conceptual orientation (involving people and environment, towards dialectical observation) and the methodological approach in philosophical orientation (in an ontological frame of reference, a holistic view of existential phenomenology and hermeneutics), are organized from the discursive ambition of architecture to advance its epistemological basis. For example, Donald Schön's theory of design as reflective practice (1983) was among the first experiments to deal with the interpretative and contextual nature of knowledge, based on the interaction in the environment. His theory seeks to establish the relationship between *problem-solving project* and *reflective practice* and *creative production.* Driven by desire to learn from experience, *reflective practice* evolves around deliberate activities that engage the architect in a critical manner with the relationship between conceptual, theoretial and practical concerns. [10] The epistemic value of these investigations is secondary to human experience, because knowledge can, in certain types of projects, [11] come out as a by-product of the process rather than its primary objective. Nonetheless, evaluating experience in the light of existing knowledge, according to Boud, Koegh and Walker, involves integrating this new knowledge into one's conceptual framework. [12]

Being one of the key narratives in the reality of practice,[7] Gilles Deleuze advances the "problematization" of practice and its epistemological foundations. It was prescribed to Deleuze's disputation on understanding a disciplinary exchange of concepts. Not being based on direct translation of concepts in architecture, it rather uses an abstract thought model for transmission between different discursive fields. In this way, it eliminates the idea of an analogy or metaphor by which concepts would be transffered from one discourse to another. For example, Deleuze replaced cinematic concepts with blocks movement-duration (*les blocs de movement-durée*, Deleuze 1987). Following Deleuze's transfer, concepts in painting were replaced by blocks of lines and colors, while concepts in architecture were validated as blocks of images and movements. As such, they were proposed for further transposition of concepts from film, literature, and painting into architecture. Furthermore, in regard to the interpretive framework for *practice-based research*, Jill Franz exemplifies the recognition of the artistic aspects of architecture. She points out that the contribution is not in the field

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7 Several contemporary narratives of institutional practice were questioning the limits of truth. This investigation was initiated in Lyotard's prophetic essay ***The Postmodern Condition***, where he forecasts the terms of legitimation within contemporary university discourse.

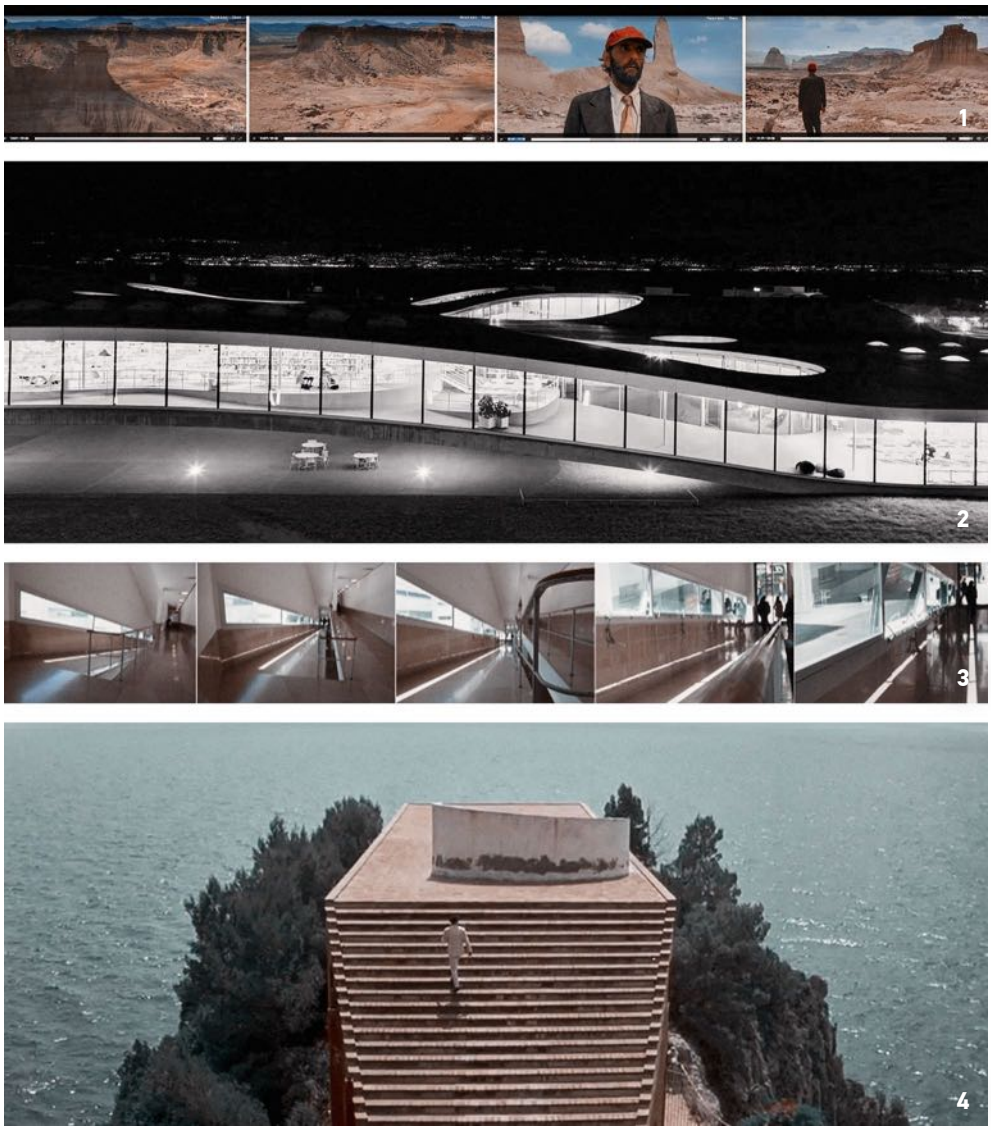

Fig. 1: Wim Wenders, Paris, Texas, 1984 @ Film stills.

Fig. 2: SANAA, EPFL Learning Centre, 2010 @ epfl.ch.

Fig. 3: Space sequencing. Project by Katarina Andjelkovic, performed at the FAUP [The Faculty of Architecture of Porto University], 2012 @ Project by Katarina Andjelkovic.

Fig. 4: Jean-Luc Godard, Contempt [Le Mépris], 1963 @ Film still.

of research in design practice in general, rather in research through design. According to Franz, the recognition of artistic implications in architecture is reflected in understanding artistic experience. In these cases the concepts of art and knowledge achieve an expanded meaning in architecture. According to Lars-Henrik Ståhl from Lund University, "this type of artistic approach in the practice-based research framework provides an opportunity to understand artistic implications in architecture, and hereby prepares the ground for new aspects of architectural knowledge." [13]

5. Cinematic design of the 1990s onwards

It seems that the use of film and cinematic principles came more naturally at particular American universities to facilitate engagement with architectural spaces. Most notably, Bernard Tschumi's (the former Dean of GSAPP, 1987-2003) Columbia University teaching curricula of the 1990s was inspired by film to introduce new conceptual devices into architectural education. Tschumi focused the criticality of an organizing structure of architectural programme that could exist independent of use, and proposed an 'abstract mediation' device reinforced by recent developments in philosophy, art and literature. [14] In teaching design, the question of cinematic architecture was open by showing an attachment to poststructuralist and deconstructivist theories, and the philosophies of Derrida, Deleuze, Barthes and Bataille. Regardless of how much Tschumi sees his argument rooted in the decomposition of linguistic formalism, he demonstrates a deep fascination for the fragmented, composite quality of contemporary urban spaces, and the expressive nature of architectural form and function. The consequence of this approach is that theories related to film, film editing and cinema have permeated the process and articulation of architectural and urban design. [15] In the next decade, the official Visual Studies Curriculum at GSAPP has continued to change in the like spirit, grounded on what Tschumi started with paperless studios around 2004. Furthermore, for the past seven years Wiel Arets, the new Dean of the Illinois Institute of Technology (Chicago), has been exploring "Re-thinking the Metropolis" - the vision for a new era of the school. The college's new educational and urban-centric approach thematically spans from Fritz Lang to Rem Koolhaas,[8] recognizing the altered circumstances of the human condition. It has become commonplace to consider cities as profoundly mediated environment, where media crucially change the way we perceive space, behave, interact in our environment, and consequently the way we understand and configure future urban settings. This pedagogical shift opens the prospect of a reinvigorated IIT and Columbia GSAPP's "Studio-X" pedagogical typologies as schools for the twenty-first century.

Media and Architecture (2012) Graduate Seminar in Media Studies, taught by Shannon Mattern at The New School in New York, introduces the narrative dimension of cinema. Mattern believes that teaching architecture must be considered as a diachronic exercise,

[8] Since the time of his ***Delirious New York***, Rem Koolhaas continues to pursue an interest in the relationship between architecture and cinema.

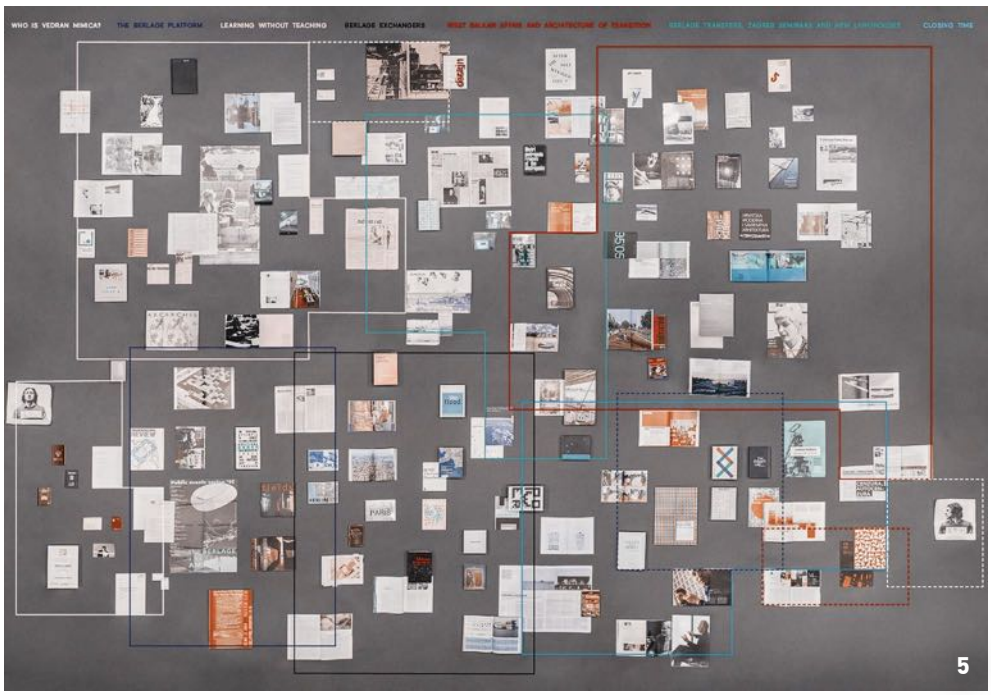

Fig. 5: Vedran Mimica, Algorithmic scripting for the book The Berlage Affair, 2018. Dizajn: Damir Gamulin Gamba @ Courtesy of V. Mimica.

because without time, narrative will not be generated. It deals with creating a vision of space through time and detecting the ways in which past and present interact. Mattern's teaching approach found answers to the question: how to operate film in the design, as both film and architecture explore spatiality and temporality as fundamental categories of human experience. Her design pedagogy uses architectural programme structured by cinematic means: as a function of the past (programme becomes the lessons of history), as a function of the present (programme is the act of design), and as a function of the future (programme is the beauty of infinite combination of events that can occur within a space). On the other hand, using mental maps of the city as mental representations of what the city contains and layout according to the individual, has brought human condition even more firmly into the discussion. This method uses the notion of temporal sequences and their relation to the visual appearance of architecture. This pedagogical shift provided students with a personal approach to studying urban environment and helped them re-connect with the reality of urban condition of the everyday space. This way the consumer of architecture becomes what Giuliana Bruno refers to as the 'prototype of the film spectator'. [16] Ultimately, the spatial relationships and physical dimensions of objects change with each viewpoint. What comes along is introducing the order of experience, the order of time – movements, intervals, sequence (Fig.3) – for all inevitably intervene in the reading of the city, which was made possible by applying the tripartite mode of notation - events, movements, spaces. [17]

6. Cinema as a research tool: critical evaluation

Going beyond mere representation, cinema as a research tool, rather than medium, requires challenging the traditional disciplinary boudary, which is demonstrated in the previous examples. These studies have also shown that the basic prerequisite for engaging in cinematic research is the study of the visual qualities of urban environment and the setting of a subjective and empirical counter-perspective to rationalist doctrine and the study of spatial paradigms (Walters and Brown, 2004). Crucially, to introduce cinematic design practice in teaching beginning students requires it to be more than an alternative to the existing curriculum. Being still unburdened with the conventions and traditions of design thinking, and using only their own senses and camera to experience their immediate environment, the 1st year students have an opportunity to comprehend the age of mediated space they currently live in and begin placing architecture in that world. This is possible because film has an enormous capacity to exit the dark room and pave the way to exploring the street, equally entering the social milieu and the gallery, transcribing historical messages or walking the political discussions, Apollo adventures and Sci-fi imaginations of future societies. Its diverse means of addressing varying aesthetics, cultures and environments, make film compatible with both means of production and representation of architecture. Equally, the film has a potential to become architecture, insofar as it transforms the immediate presence into mediated or mediatized urban experience, as suggested by François Penz and Andong Lu. [18] Or we can learn the lesson from the practicing and research architect Daniel Libeskind who sees a possibility of mapping human relations in reading Hamlet. Or take an advice from Wiel Arets who advocates for understanding Godard's reading of architecture, the way casa Malaparte's

interior and exterior are prominently featured in his 1963 film *Contempt* (Le Mépris, Fig.4). On the other hand, artist Darko Fritz detects the problematic relationship between the two disciplines concluding that architecture students feel unconfortable experimenting with a video because they are not trained as conceptual artists. Yet Rem Koolhaas' installation for the Venice Biennial Fundamentals (2014) proposes a view on architecture from the lens of Italian neorealist film production (Antonioni, Pasolini). Recently, video artists' scripting system is considered important by Bill Viola. More recently, the experience of new generations has demonstrated that 'thinking through images,' which was intiated by the modern authors, has the capacity to promptly transfigure to 3d spatial elements, so that architecture remains at the conceptual level. Mobile applications function today as a prosthesis, new media like Facebook work to abolish differences and establish the control of the world, while the algorithmic scripting has become a new instrument for designing, already tested in Vedran Mimica's book *The Berlage Affair* (2018, Fig.5). Applying the system of tagging moves us away from the film scripting towards establishing relationships between data. The result of the algorithmic reading of text and images is the collage. Expressing the beginning of faith in the algorithm, we are moving towards a post-human society but the question still remains open: how do image and moving image relate to designing spaces?

7. Conclusion

Given that the twentieth century was the century of the moving image, our contemporary life in the early twenty-first century has been completely formed by the impact it had on our way of thinking, moving around and seeing things (Wim Wenders, 2003). It is indisputable that these twentieth century thought-models make a framework for knowledge transfer, because architecture integrates all other forms of life and, in Vedran Mimica's words, "architects are most capable of manipulating elements of other disciplines." [19] On the other hand, Jean-Luc Godard claims that architects have the ability to 'read', which allows for speculative discussion in architecture. Probably most prominent testimony to his claim is Elizabeth Diller's architectural practice using video to speculate about space (teaching methods applied at the Cooper Union 1980s-1990s). [20] Featuring the key points of the art of architecture debate, such a profound change has grown to be established in our visual literacy, as part of what we need to learn, or in words of Walter Murch: "You need to know how to write, you need to know mathematics, you need to make a film even if you don't become a filmmaker. You need to know what goes into making a film because films will manipulate you through the media if you don't know what's happening."[9] Today, media are connecting diverse narratives and people into a multi-dimensional experience of the screen. In a similar way, if this is applied to the experience of space in which we are manipulated by media, and use these tools in return to create our own narratives, we are deeply involved with thinking and conceptualizing space which might revolutionize in our everyday experience of the city. Besides, what type of knowledge architects often have to deal with?

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[9] To get a sense how, watch Liz Diller's video: *What is real / What is virtual?*

Given that they deal with solutions that lie in the future, where all the defining criteria for the solutions are not known, this kind of anticipatory knowledge or knowledge of the future is about setting up a model for something as yet unknown. Consequently, using moving image and establishing a framework for things to come is still in the domain of abstraction of the concrete solution and knowledge. What educators can do is to experiment with the fact that knowledge is not static, that it metamorphoses in time, as earlier elaborated by Awoniyi. [21] More importantly, a constant appropriation of new knowledge for designing space is well aligned with Murch's ideas about what the democratization of media was all about: "with writing we had to develop literacy, motion picture is no different." Then, it is debatable how to use film for theorizing and practicing architecture today when contemporary media abolish differences and control the world?

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The Polymath Architect: Cinematic and Architectural Space || Time

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Abstract

Spatiotemporal perception has become increasingly normalised through modern academic pedagogy and the use of architectural design software. Qualitative abstraction of concepts like scale, movement, materiality, narrative, light, affection, context are suppressed by the attempt for quantification and programmability of function. Film Studies can provide a distinct perspective on the concept of time and space structuring, that affords a more open but complete understanding of relative ideas like narrative, history, causality, aesthesis. Cinema itself is a unique tool for the representation of architecture and its theoretical frameworks. Introducing an interdisciplinary exploration of spatiotemporal forms, especially in early semesters of architectural programmes, makes sure that students are equipped with a widened range of paradigms which can inform a future process of architectural design. Architecture Schools should aspire, once again, to educate polymath architects.

1. Introduction

This presentation makes the case for an urgent need to re-introduce interdisciplinary methods of exploring spatio-temporal concepts and forms, as part of the early semesters of the architectural school curriculum, in order to equip young students with a widened range of paradigms which may inform future design processes. Specific mention will be made to the current pedagogical approach of architectural studies, especially in relation to a tendency to accentuate the technical part of design, through the use of architectural design programs. Moreover, we will discuss how the use of such CAD programs may distort the perception of architectural concepts, more detrimentally in an early stage of thinking about design solutions. Several historical examples of prolific architectural schools and celebrated designers or architects, will provide us with a template on the interdisciplinary approach of both pedagogy and design. Finally, we will use a specific study case of interdisciplinary teaching and learning, that took place at the Department of Architecture of The University of Cyprus, just a few months ago, to foreground how cinema and film studies can provide a more open perception of spatio-temporal concepts and provide an advantageous understanding of ideas that are related to architecture and design.

1.1. Diploma in Architecture Curriculum: Old Paradigm VS New Paradigm

Scouring through multiple curriculums of Bachelor Degrees in Architecture, whether it is a more generic programme or specifically directed in Architectural Engineering or Design, one can confirm that entire syllabi of studies are built solely on modules that are centered around architectural design alone and are taught exclusively by architects. Does this present an ideal teaching and learning environment: in the duration of a three to five years academic programme, never interacting with specialists from a relative academic discipline? Even in the case of more informed and modernized programmes, the appearance of multidisciplinary modules occurs at a later stage, following a number of semesters with purely obligatory courses on design and engineering. As a consequence, already established strategies of design approach are almost immune to the open and abstract nature of the multidisciplinary examples. When a student is finally presented with an opportunity to explore other areas of academic study, through the inclusion of targeted multidisciplinary modules, in actuality, courses such as: Architectural Digital Photography, History of Modern Art, Architecture and Cinema, Anthropology of the City, Theatrical Scenography, to name but a few that are offered as electives, often remain unavailable due to: lack of academic personnel, limited numbers of students, scheduling complexities, or merely, the inability for good interdepartmental communication. Moreover, a module that possesses true multidisciplinary elements, need not be shaped to respond to another area of studies directly and should not be taught by, in our case, an architect with a personal research interest in an area of studies tangentially approached in relation to their science. Rather, it should provide any relevant knowledge unadulterated, in order to allow students to create their own free network of connections with architecture, and should be taught by a specialist on the differentiated area of studies, in order to presume a wholly distinct point of view.

1.2. The example of the Bauhaus School

The diagram that presents the curriculum of the Bauhaus School is in itself a statement about the open nature of teaching and learning. Starting with a generic appreciation of concepts that may be related to architectural design and construction, the most important aspect of the pleniminary semester was a lack of objective results. The description of a student's gradual engagement with architectural design and build is eye-opening: "a regular course in architecture was only introduced at the Bauhaus in 1927. Only the most talented students were admitted to the architecture course. At the start of their studies, they received a year of basic training in the so-called preliminary course, in which they were able to experiment with colour, shape and materials with no specific goals" [1]. In essence, belief was placed upon the concepts and materials themselves; they would incite what their relation to architecture may be. And surely enough, the result of this approach brought innovative design, unpresented construction solutions, a solid expression of contextual relation and a balance between materials and construction. And although Walter Gropius himself defends this belief towards craftsmanship in the manifesto of the Bauhaus School: "The art schools [...] must return to the workshop. This world of mere drawing and painting of draughtsmen and applied artists must at long last become a world that builds. When a young person who senses within himself a love for creative endeavour begins his career, as in the past, by learning a trade, the unproductive 'artist' will no longer be condemned to the imperfect practice of art because his skill is now preserved in craftsmanship, where he may achieve excellence. Architects, sculptors, painters—we all must return to craftsmanship!" Nevertheless, the lifestyle of the students was enriched with cultural experiences: extravagant parties, psychology, music, philosophy, dance, politics. And as a consequence within the work of graduates of the early Bauhaus one can discover both a balance of artistry and build, but also a designer's response on the contemporary world.

1.3. The example of Charles and Ray Eames

A second example to support a pedagogical model of fostering polymath architects, involves the creative duo of designers, architects, fine artists, scientists, filmmakers: Charles and Ray Eames. Once again, proponents of a practice based approach to concepts and ideas about building or constructing, they went on to work with a wide range of individuals in their experimental facilities, Eames office. Out of this facilities came, kinetic sculptures, architectural design, furniture, graphic design, films, even medical innovations. The broad range of people involved in the initial process of design and up to an exhaustive development procedure, acted as the equivalent of a method of multidisciplinary development.

Bypassing the monumental work *Glimpses of the USA* (1959) as an example of multidisciplinary production with an enormous cultural impact, signalling the first contact of the kind between Russia and the USA in the 1960s, I would like to consider another more traditional example of film produced by the Eames Studio. It is the short *Powers of Ten* (1977): intensely thought provoking, aesthetically compelling and scientifically rigorous. For, I cannot think of a more effective way to get first year students - whether we are referring to

architecture, medicine, physics, mathematics, chemistry, visual arts, biology - to think about the concept of scale, in relation to space and man. The short film showcases the abstract connection between the tremendously large and the infinitely small, as well as, our relative position within that scale. And for this reason alone I would consider it an obligatory viewing for future architects.

1.4. When should students of architecture be exposed to multidisciplinary subjects?

If we accept that a multidisciplinary approach to design is beneficial for architecture students, this raises an important question: when should students be exposed to multidisciplinary paradigms? Lawson argues that "the concept of creativity is primary for any process of knowledge dissemination and is integral to any process of design" [2]. Therefore, teaching creativity should precede an attempt to develop design solutions, for, if design methodology comes before the culmination of creative thinking, paradigms will be installed which permeate the overall design approach and exclude creative solutions. But, is really teaching studio design in clash with creative thinking? Creative thinking ought to be original, analytical, open, relational and communicative. One would attribute similar characteristics to a successful design methodology. But, while a young student has not yet informed a design vocabulary with elements such as: space, concept, texture, material, scale, action, rhythm, relation, duration, complexity, context, economy, technology, history and so many more, it should not come as a surprise that students approach all design problems fixated on technical capability and meeting given objectives. They enact a pedagogical example that is solipsistically centred around the qualities of their design project, bypassing the creative challenges of their assignment. Consider a counter example, where an assignment is approached and discussed not within the context of design studio production, but only in relation to its cultural, historic, aesthetic or philosophical attributes; students are afforded to advance their creative thinking independently and before proceeding to the technical accomplishment of deliverables. In such a case it would be very interesting for the academic tutor to evaluate the results of proposed design solutions in terms of originality, openness and conceptual rigour, in contrast to a previous design oriented teaching example that describes the nature of the outcome in a very clear, objective and measurable, but at the same time predetermined manner.

1.5. Proposition for a sensory perception of space and time, or "walk the line"

The way that students adopt preconceived design methodologies and become dislocated from the meaningful perception of architectural concepts prior to the design process, often relates to a glorification of the technical aspect of Computerized Aided Design (CAD). Traditional tools that bridge the artistic and technical aspects of architectural design, like freehand drawing, are abandoned for the sake of speed and clarity of execution, precision and complexity offered by CAD applications, even in the early semesters. The importance of freehand / model / technical drawing or any other drawing module that foregoes the use of CAD applications in exchange for actual pencils, pens, brushes, colours or other tactile tools during early semesters, is vital for an understanding of architectural concepts which is

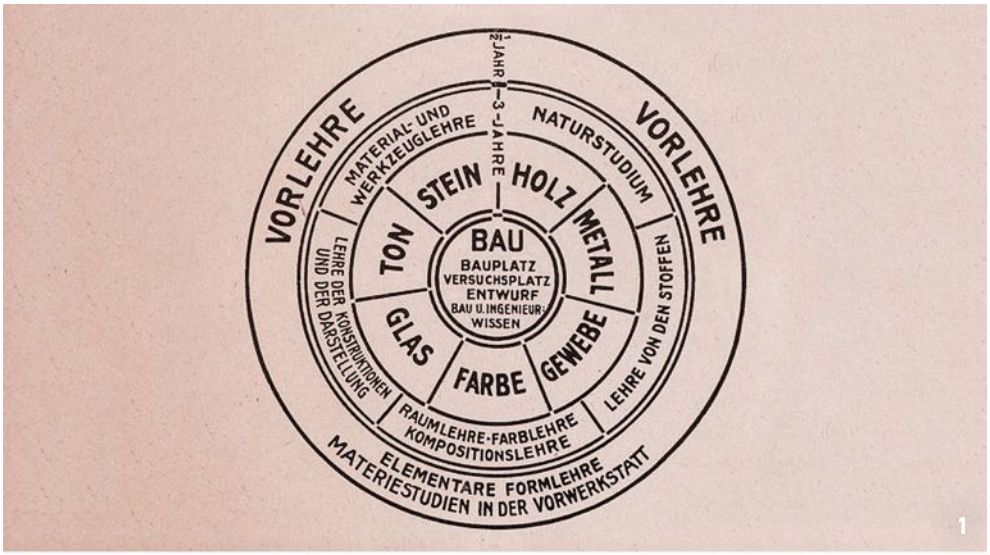

Fig. 1: Bauhaus School Curriculum.

Fig. 2: Installation view of Glimpses of the U.S.A., American National Exhibition, Moscow, 1959 © Eames Office LLC.

essentially differentiated from computer aided design. The rhythm of dragging a pencil onto a piece of paper is an actual and felt gesture of measure and scale, it is a qualitative indication of form and shape, it is a physical manifestation of space and time; as such, it provides feedback that is related to organic drawing and humane design. On the contrary, using CAD applications often disconnects the design process with the aforementioned design concepts, for, it does not inscribe the design actions with elements of qualitative perception. For example, scale may be semantically denoted by an indicator, but often becomes forgotten since the marking of lines and shapes lacks the concept of temporality as a qualitative indication of scale during the design process. Thus, scale is no longer physically perceived during architectural design. Similar syllogisms concerning, form and shape, open and close, motion and rest, e.t.c. make it evident that, we need to incorporate forms of qualitative perception of concepts, prior to approaching these within a design process. This can be done either by re-imagining the first year modules of the architecture curriculum, in a way that they introduce concepts and materials without attaching them to specific design goals, or by including multidisciplinary modules which present such concepts within a differentiated framework, in order to secure an open and imaginative utilization in the context of a future design process.

1.6. The importance of Cinema and Film Studies for Architectural Studies

It is established then, that an interdisciplinary approach enhances the perception of architectural concepts and facilitates the design process. But I would like to make the additional claim that: it is of the greatest importance to expose students to an appreciation and understanding of cinema, since it exhibits a very unique trait. For Film Theory, the conceptual and semiological approach that constructs the meaning of moving images, can often be transferred to the cognitive perception of the real world and our everyday experiences. This cinematographic nature of our perception was first described by Henri Bergson - *Matter and Memory* - [3] in his attempt to explain our understanding of the physical world through memory, noting similarities between a cognitive process that relies on recollection for meaning creation and the perception of moving images. By introducing a theory of cinematographic perception in the early semesters of the architecture curriculum, essentially a young student is given an additional way of making sense of reality itself. One could exclaim: “but every science does such a thing!”. The distinctive link between reality and cinema, is their eidetic visual simulacrum, that is to say: their likeness. Consider the science of chemistry -one of many examples- which also provides an understanding of the real world, but its scientific armoury is detached from the everyday image of the real. In the absence of a utilization of Film Studies tools, the perception of all qualitative architectural concepts suffers: light, time, materiality, scale. In the context of traditional teaching methods, concepts remain virtual, textures are imitated, light is rendered, transparency and reflection are drawn, motion is reconstructed, but none is experienced of perceived. But, due to their uniqueness, moving images provide a representation that salvages the qualitative characteristics of time and space, entangled in movement, experienced and perceived as lived duration.

1.7. A study case: an introduction to Film Theory for first year Architecture students

In the context of applying a multidisciplinary approach in the early years of teaching architectural design, I was invited by lecturers Mrs. Tereza Tourva and Mr. Charis Christodoulou to give a presentation to the first year students of the Architecture Department at The University of Cyprus. This took place in February of the current year (2019) and was part of a second semester design module, titled: Architectural Studio. A very conscious decision was taken to expose students to an admittedly demanding cinematic masterpiece for people that are not initiated in film spectatorship, let alone film theory. *Last Year in Marienbad* (1961) by Alain Resnais [4], even in the framework of audio-visual studies, is considered to be a highly complex example of cinematic representation and film theory / philosophy. Gilles Deleuze, the French philosopher that attempted to describe a typology of moving images, as cinema advanced to the post world-war era, considers this film to be the primary example for his introduced concept of the crystal image: the cinematic type of representation that fragments spatio-temporal continuity, and thus, narrative causality, providing the most compelling study-case, for film elevated to an autonomous form of art. Most importantly "*Last Year at Marienbad*'s innovation lies not only in the disrupted linearity of the narrative, but also in the way Resnais used and manipulated architectural space in order to translate this into a visual form, breaking free of pre-established conventions of building narratives in cinema." [5] Therefore, trust was put into the fact that: if during the course of the presentation the students of architecture are equipped with the tools of film theory and analysis, they ought to be able to provide connections between architectural elements -space, materiality, movement, exteriority VS interiority, multiplicity, history- and the cinematic representation, as well as, extract the symbolic meaning and philosophical subtext of the images on screen rather than only being aware of their literal representational content.

1.8. A study case: an introduction to Film Theory for first year Architecture students

In the course of a two hour long lecture, titled: Χωροχρονική Κατασκευή και Κινηματογραφική Αντίληψη [trans: Spatiotemporal Construction and Cinematic Perception] students were introduced to the following:

- brief history of photography and cinema: noting the ontological significance of photographic and cinematic images, as evidence of the real
- montage and other elements of filmic language: explaining their importance as tools for construction of spatial and temporal continuity in cinema
- cinematic space vs architectural space: presenting similarities / differences of spatial and temporal characteristics, using filmic examples

Finally, students themselves were provoked to re-examine moving images on screen that they attempted to describe and analyze at the start of the lecture. Surely enough, their approach toward the film changed entirely and upon successful application of newly available tools for film-text analysis, they were able to suggest that:

- images are saturated with symbolic meaning: finding specific temporal reference of past-present-future, to an image that depicts three arches

- reality is impaired due to the spatial construct of the film: complexity, repetition due to the use of mirrors, landscapes that defy visual representation, e.t.c.
- movement was related to emotional condition: increased perception of camera movement and intentional connection to various emotional states

2. Trivial conclusion || Harsh Reality

It may seem like a trivial conclusion, to observe that: early exposure of architecture students to paradigms of multidisciplinary approach to architectural concepts, highly benefits their future design methodology and solutions. The triviality of the aforementioned statement is upturned, by the harsh reality of multitude of architecture design curriculums, which comprise solely from technical-minded courses. Architecture schools need to redefine the contemporary concept of the architect, in order to coincide with the multifaceted demands of the modern world, in which architects are called to be, not just designers but also artists, builders, sculptors, scientists, philosophers. The true definition of a great architect therefore, still implies that: an architect is a polymath.

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Growing an Extended Design Scope on Solid Design Studio Foundations

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Abstract

The world of architecture and design has exploded into many pieces, blurring the traditional borders we were used to. Nobody will be surprised that in the coming years architects take previously unexpected jobs. The path started at the Bauhaus 100 years ago, moved over to the School of Ulm in which Maldonado, Rittel and others started a new approach to design, not limited to physical objects but the non-tangible as well. This start of the technological era was then nurtured by Scandinavian-born participatory concepts, setting the conditions for the onset of terms like Wicked Problems, User Centered Design, Design Thinking, Artifact... The architectural approach is 'per se' a powerful set of tools to address both technical and design problems under a global perspective. Without abandoning space and materiality as our core design *'problem'*, we need to offer our students the tools to address multi layered situations that might be not exactly located inside the classical Architecture Design Studio syllabus. Currently teaching at the University of the Basque Country, we are blending together classical options with methods and tools tested during my teaching at the 3.007 Introduction to Design course at the Singapore University of Technology and Design. In this course, first year students of the four academic pillars (Architecture and Sustainable Design, Engineering Products, Engineering Systems, Information Technology) were asked to solve, by groups, design problems. *'Participants will be exposed to core technology and design themes including principles, design processes, modes of thinking and analysis, relationships between form, space, structure and materiality, and social and cultural aspects of design'*. This syllabus, developed in collaboration with the Boston MIT, tackles real projects and prototypes, addressing from building design to wearables and using tools that involve technological components but also classical design journals, hand drawing, video montage and storytelling.

1. Into a global scope for design. Blurring the borders and opening minds

The world has changed. It is still changing and so is the world of design being transformed. When addressing architectural teaching, there is no other option that understanding that architecture is a part of a whole extended world of design. This first year of the academic trip that architectural students are going to be involved in is crucial to frame this vision and to build the foundations on which their mindset will be built.

The definitive irruption of new technologies is shaping a new model of society and therefore a new way of tackling architecture as a practice and as a social fact [1,2]. However, it is not the first time in recent history that a core transformation in social parameters triggers a fundamental change in the way design and architecture are understood. We are going to stress two main milestones in the academic approach to design and architecture, both reflecting renewed and disruptive academic strategies at their time of history.

These two academic benchmarks, namely the Bauhaus and the school of Ulm, gave a special importance to the first academic course, where you have the opportunity to shape the mentalities of the new students and open up for them the richness of the world of architecture and design [3]. Our current research on new teaching methodologies for architecture and design, and specifically for the first year of studies is based both on a review of the two benchmarks of the Bauhaus and the school of Ulm and the study of current experiences, our own and external. Some specific examples will be showed over this article.

2. The importance of a first year course. Bauhaus and ulm as references

In the very short extension that this article, let us take a glimpse at the two benchmarks of the Bauhaus and Ulm. The Bauhaus and the school of Ulm adapted themselves to the crucial social changes they were living. We can say that the Bauhaus changed/expanded the classic teaching with the aim of ending the separation between art and crafts, that is, between Fine Arts and applied arts. The Vorkurs is the name that the Bauhaus gave to their first year. It was a course where mainly Itten [4] used innovative methods, including rhythm, music and body movements to open the minds of the students (and to have them tested)... In the Bauhaus as a whole, the framework was extended to give entry to the new social and economic context: the democratization of products (and therefore design) induced by the mass production of the second industrial revolution [5].

In the years when the Ulm school was established, the two world wars were over and the social and economic conditions were again new. The weight of social sciences as subjective components takes center stage in order to be able to tackle non tangible problems that are showing up in the world of the 50's and 60's. Among these new concepts and issues to be addressed, the binary computing world starts to appear, not always linked to computers themselves but as part of a new way of understanding the world [6]. We can say in this case, that Ulm widened up the scope from the Bauhaus taking another step forward. If the Bauhaus moved for the Beaux Arts vision to industrial design, Ulm advanced looking avidly

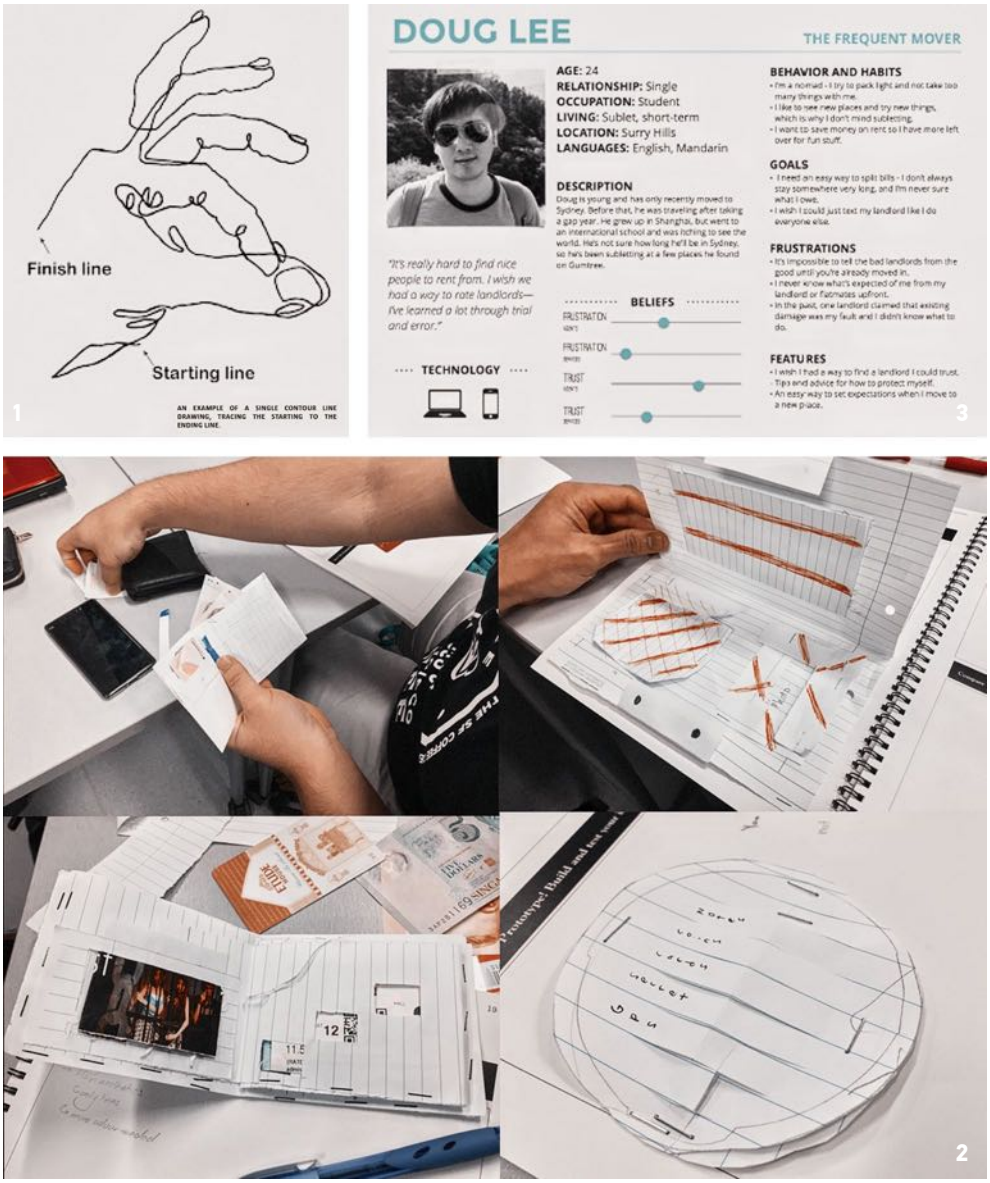

Fig. 1: SUTD Design Journal. Blind Drawing Exercise

Fig. 2: Hands on Approach to Design. The Wallet Exercise.

Fig. 3: SUTD Design Journal. Working with Personas.

for methods and ways to approach this new frame that incorporated the intangible, that cradle that will see growing in the coming years new concepts like Design Thinking, Service Design, Research Through Design and Others. The first year in Ulm took also the Vorkurs name, even though it was more focused in on extending the creative background of students and not as disruptive as in the Bauhaus.

How did the school of Ulm introduce the zeitgeist in order to establish these basis? Ulm took a step forward from the Bauhaus. While in the beginning, under Max Bill, it started somehow as a continuation of the Bauhaus methodology and approach, it moved on, with Maldonado mainly [7], to tackle the concept of design understanding the process as a system that incorporated social sciences and other "non-tangible" elements that already were making the computer, without computers, thinking present in their strategy. This vision became most present under the late influence of Rittel, who created the concept and term of the "wicked" problem [8,9], a clear approach to design problems from a mathematical and hyper logical mindset.

3. Foundations for a research on an extended scope for design and architecture

In these last years, and more specifically since 2014, we are researching on teaching methodologies around the world in order to be able to apply them to architectural teaching. The Doctoral Thesis of Juan Sádaba [10], based on a practical approach by studying a real case of a patent, is also a consequence of a cross-disciplinary intersection between architecture, industrial design, urban planning and information technologies, that opened up an interest on his mixed-input practice, but at the same time on how to find the means to introduce these new combined field found in real practice into academy and teaching. We have been since testing methods and organizing tools in order to acquire the adequate information and be able to create a corpus that can be used in design teaching.

One of the biggest problems comes here, as a start. Universities usually operate in separate blocks, most of the times following the traditional borders of design practice [11]. Cross-disciplinary teaching is not easy to find, and it is what society is demanding now.

At this point, it is key to build a potential set of activities that can be used on one only academic term, extended to a full year or even spread over several years of study. The backbone of this methodology will be rooted on three main complementary approaches:

- The classical architecture design study methodology, which is based on:
  - Designing freely but inside a technological framework
  - Prototyping making and iteration with continuous crits and reviews
- The Bauhaus addition to the previous, which provides a more holistic vision of design linked to market and manufacturing of products, adding artifacts and a hands-on approach to the skills-developing set.
- The Ulm (and posterior) addition to the latter, which contributes with including the

final user in the equation through diverse methodologies that go from participatory design to innovation, dealing with 'persona' concepts and team work.

There are already some successful attempts around the world to combine the teaching of design and architecture together with information technologies and engineering. It is not the only one we base our research on, and actually the biggest part of it is developed at the University of the Basque Country, where this tools and others are being tested, combined. However, looking out from Europe, it is interesting to take a look at some external cases.

4. Case study for a first year design studio

as a case study from which we can extract some knowledge, we are going to go over some levant features of the first year course taught at the Singapore University of Technology and Design (SUTD). This course '3.007 Introduction to Design' [12] is a core subject the students of the different pillars have to go through. The four academic pillars are Architecture and Sustainable Design (ASD), Engineering Product Development (EPD), Engineering Systems Design (ESD) or Information Systems and Technology Design (ISTD). As the description of this course states: ´Participants will be exposed to core technology and design themes including principles, design processes, modes of thinking and analysis, relationships between form, space, structure and materiality, and social and cultural aspects of design´. The course s based on previous experiences, in a big part inherited from the Massachusetts Institute of Technology in Boston, USA, together with whom SUTD was stablished in 2012. The undergraduate curriculum was designed to offer a common ground learning to the Freshmore students in the first terms [13]. In this article, we are going over the process put into practice in the 3.007 course under a specific work theme: wearables.

4.1. Opening up Students to a Design Mindset

It is not uncommon that students pointing at engineering and technology did not have any relationship with art or design. Nonetheless, the world has changed, and their approach to problems will be the same that architectural students will receive. Johannes Itten, differences aside, used the Vorkurs at the Bauhaus with the same goal.

As a start, it is often good to use non-specifically architecture or engineering methodologies:

- Purely creative 'beaux arts' exercises that are more related to liberating your mind, like Itten used to do in the Vorkurs of the Bauhaus. Here we can include Blind drawing which consists on drawing without looking at your hands, drawing your right hand with your left and viceversa, material collage interpretation of musical rhythms or any other brain opening technique directly borrowed from Fine Arts. picture of blind drawing. This should be an individual practice, oriented to finding theirselves dealing with creativity and dropping off their fears to the blank paper.
- Analysis of existing designs. It might be of any scale, ranging from small products to architectural and urban design, but always including technological factors. The analysis will be done by groups and presented in class. Every aspect should be

analyzed: aesthetics, function, user, innovation, market, cost... Might be that what they studied will open a field of research where they will work along the course. picture of presentation. In this case, they are going to work in groups, starting to understand how to cooperate and adopt different roles for the delivery of a specific shared task.

4.2. Team Work Basis. Empathy.

Following the experience of the previous exercise, the students will have to work in teams creatively this time. Actually, in this case, they have to understand the final user, their mate. They will try to understand her/his needs and adapt the initial design idea to her/him.

In this exercise, typically one students asks their partner about what they need for a wallet. It forces them work fast (60 minutes) on a hands-on design that has to fulfil the needs of the partner (empathy). The wallet project (a classical Design Thinking exercise) [14] usually utilizes paper sheets, but it can be done with any material. Both partners have to end up with a prototype. It is usually divided in the following steps:

- Sketch your initial idea.
- Find out precisely what the users want. Partner up and interview your partner, develop empathy. Write down meaningful and insightful notes from interviewing your partner.
- Reframe the problem. Write down and encapsulate interesting findings.
- Take a stand with a point-of-view, concisely state an innovative opportunity(ies) to help your partner and the reasons why.
- Ideate! Generate alternative approaches. Sketch at least five radical and diverse approaches to meeting your partner's needs.
- Share your solution(s) with your partner and obtain feedback.
- Iterate, based on given feedback. Change and re-create innovative solution to deal with the problem stated.
- Prototype. Build and test your idea.
- Share your solution and obtain feedback (what are the successes, areas of improvement, avenues for change and advancement?
- Compare your final solution with your initial sketch...

Understanding empathy and the concept of User Centered Design is important as part of the design process and at this point they get a flavour, despite being treated more in depth later in the course.

4.3. Cases Studies. The Technological Body. Time and Design.

At his point you can introduce the theme students are going to work on. The technological body is the idea presented in this case (year 2016). Students are shown examples of different kinds and then, by groups, they identify the project they want to work on. It can be from a wearable to any project (architecture and urban design included) in which the dimension and

proportion of the human body becomes key. The groups of students are encouraged to use information technologies and work with data on their prototypes. Usually they use easy and not costly to program and install hardware, like Arduino and alike.

For this term, eight group of projects, grouped by design approaches were introduced. All of them under the umbrella of creating a better world and fostering the idea of entrepeneurship in the students. They are proposed, as a first step, to analyze a existing project. The 8 groups of projects were:

- Augmented Expressions
- Collective Consciousness
- Honing/Refining Productivity
- Bio-Hybrid Interface
- Conditioning the Environment
- Transforming Identity through Prosthesis
- Body Shape Aesthetics
- Amplifying Invisible Micro Signals

Inside each of the groups there are real design cases. The students should choose one and analyze it. For the analysis, they are required to use a specific technique taken from cinema: and another one from Industrial Design: montage (like in cinema) on the one hand and piece disassembly/exploded view on the other.

Disassembling a product in a kind of reverse-engineering fashion, is highly educative, as it helps students understand how it is build and even the mental process of creating and manufacturing it. We try to always encourage this understanding for any size and type of project, from tiny products to architecture.

Montage is also highly beneficial for a general understanding of the relationship between product and user. The sequence in which he actions and subsequent reactions happen over time gives as a good understanding of the different paths that usage can take. It is an interesting tool to add to the process of design. Students have to present a sequence in photograms or/and visualize data in a correlative time sequence.

4.4. User Centered Design. Personas.

The contribution of Design Thinking and Scandinavian to this part of design is crucial. Today, we can not understand design without it. Service Design itself, an important field of design for the non-tangible gets strongly rooted here. Usually architecture teaching does not focus much on Including the final user on the process and this is a tool that can be really useful for our students.

There are multiple exercises available. We started working on empathy in the wallet exercise and in this phase of the course we get deeper on it. Students understand the concept of Personas as a way to categorize and analyze users and get familiar to testing and interviewing tools that will allow them understand the user needs and expectations and,

more importantly, how to readapt your preconceptions once you understand your client. Students should learn that design is more and more into service as much as about physical products.

4.5. Brainstorming and Creativity tools.

As a start, c-sketch, also called 6-3-5, is very useful to allow students to generate ideas immediately. 6-3-5 exercise, consisting on 6 participants on a table each of them with a paper sheet and 3 color pencils. Each one draws three ideas on a concept and passes it over to the next one who will draw on top of them for another five minutes. At the end of the rounds will have many ideas created in collaboration by different hands on the same paper. This exercise works really well for architectural design, braking the classical boundaries of ego and my own-paper-nobody-touches-it. No need to stick to time limitations, it can be over a longer periods of time, over different days.

Once the process is ongoing and the students are generating sketches and prototyping, there are some tools that they should learn and are introduced at this phase on top of the current sketching activity. SCAMPER (Substitute-Combine-Add-Modify-Puttoanotheruse-Eliminate-Reverse) is also a healthy activity for architects. This is one of the most educational exercises you can play with students for them to understand the internal logic of projects. Pugh Charts are very useful for students to find what is appropriate in a design and what is not relevant. Taking decisions in a design process is one of the most difficult skills to acquire. Life Cycle Assessment, also borrowed from engineering and ecomaterials sciences, get students into the real world of designing with materiality.

4.6. Prototyping.

This is the most important phase of the course. By groups, students work in the Fablab creating their working prototypes and the final one for the eventual presentation. It should be a project related to the human body and it should incorporate technology. They need to learn to work in groups, taking a clear role inside and they have to document the process in order to be able to learn from their own experience and present a report. In the final exhibition they have to present a working prototype solving a problem by creating a physical product and potentially a service. Crits and reviews from the faculty are constant in order to guide them until the final presentation.

It can be electronics (Arduino, robotics, Python...) or just a piece of an architectural solution, furniture or alike. Nowadays, merging these two worlds, the tangible and the non-tangible in an educationally logical fashion is key for the future of young architects being shaped up for new work requirements. Engineers, architects, product designers and information technology students work together to create design solutions for a better world.

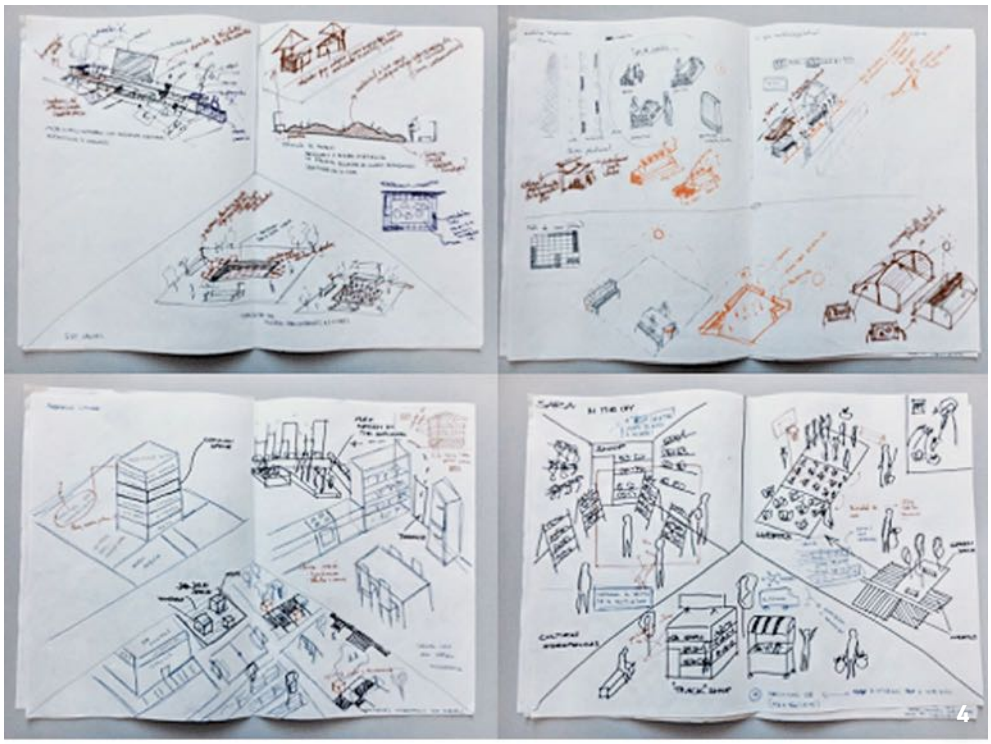

Fig. 4: 6-3-5 exercises at "City and Territory in the 21st Century" at the University of the Basque Country. 6 participants (3 in this case, due to the group size), 3 ideas, 5 minutes each (double round to make it like 6 participants). Every participant draws in a different color. You pass it on and the next one draws over your idea and so on.

Fig. 5: Artifacts and Prototypes at SUTD. Architecture and Wearables.

5. Conclusions

It is evident to us that the world of architecture and design are changing, both in academy and practice. If we do not happen to adapt our methodologies and approach, students will not feel attracted by architecture any more. On the other hand, architecture can offer a powerful set of skills that can fit perfectly in the needs and requirements that the new faces of design are demanding. Blending the human side of design, the interaction with technology is 'per se' the core of the architectural way of approaching problems since the dawn of times. We have the duty to merge our traditional way of teaching with other useful adjacent disciplines.

The same way that others did in different moments of history, we have the possibility to redesign out syllabus in order to give our students a set of competences that can permeate the classical borders between design, engineering, architecture, social sciences and data technology.

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Bridging Design and Narration

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Abstract

This text presents the 1st semester introductory course in representation technologies 'Audiovisual Representation and Image Processing Technologies' of the Department of Architecture of the University of Thessaly, in Volos, Greece. The course is inscribed in the main objectives of the Department's undergraduate program that aims at a synthetic approach to architectural design as a practice that has technological, artistic and anthropological content. The course's essential area of research in architectural education is articulated on four thematic axes. The first pillar consists of a theoretical approach to the contribution of representation codes to architectural thought and design through their interactive relationship with imaging methods. The second thematic axis aims at focusing on the relationship between physical and digital environments through the study of the evolution of space conception models, from Renaissance to the present day. Media archaeology provides the necessary analytical and theoretical tools of research on the discourse and material manifestations of culture, highlighting the continuities and ruptures that have gone unnoticed until now. A third axis investigates to establish analogies between the introduction in architectural thought of notions such as the movement of the human body in physical space and navigation in the digital space, between the design of architectural space by means of events and scenarios and the structuring of interactive storytelling through similar notions in the field of multimedia. The fourth thematic axe concerns a synesthetic approach to space conception and design as a method for mediating a multisensory, embodied and affective representation of urban life. The debate on the unification of senses in the new media era is coming up with the recent revival of interest in neuroscience, cultural studies and social sciences. In this synesthetic approach the research focuses on urban and environmental soundscapes as well as the human discourse inscribed in urban history.

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1. Introduction

Since 2003, the course "Audiovisual Representation and Image Processing Technologies" constitutes the 1st semester introductory course in representation technologies of the undergraduate program of the Department of Architecture of the University of Thessaly, in Volos, Greece. The course is in close collaboration with the architectural studio course 'Introduction to architecture' and offers the students a concise panorama of representational techniques from analog (drawing, sketch, diagram), through audiovisual (photo, moving image, animation) and digital imaging. The course is inscribed in the main Department's objectives that aim at a synthetic approach to architectural design as a practice that has technological, artistic and anthropological content.

The course's fundamental methodology focuses on understanding the interconnection and interpenetration of spatial audiovisual syntax with spatial perception models. It elaborates the architect's engagement with audiovisual language in narrative as well as in aesthetic level and advances the theoretical understanding of the cinematic narration incorporating cross-disciplinary knowledge. We believe that one can find a dialectic relation between space conception models and the moving image codification.

Representation techniques are not just means of production but they also influence the way we perceive space, time, motion, and matter. The intellectual processes of architectural design obey, to a certain extent, the logical uses of the representation tools that are embedded in architectural thought. Realising the contribution of representational codes to design behavior is a difficult task due to the complexity and the inherent contradictions of a history of representational techniques. To address this problem, our Department organized in 2005 the conference 'Representation as a vehicle of architectural thought' [1].

2. Representation technologies

The exploration of the technological, artistic and anthropological content of architectural design focus on cultural and ideological determinations of the representation techniques that constitute the conception of a particular era towards space. This focus is made possible through two different interdisciplinary fields. The first field concerns post-1980 architectural approaches to the study of the genealogy of the concept of architectural design with the aim of identifying the different phases of change in the concept of architectural conception [2,3]. The second field concerns the study of the relationship of architectural design with the pictorial and conceptual codes of a particular era. In this respect, it builds on the interdisciplinary methodology of media archeology in the search for the history of expressive media, elements of coexistence and dialogue of different modes of representation [4,5]. Media archeology is an interdisciplinary branch that brings together a range of researchers from the fields of media studies, cultural studies and visual studies. Their approach is influenced by Michel Foucault's Archeology of Knowledge, as well as by media theory. The course 'Audiovisual Representation and Image Processing Technologies' is inscribed in this theoretical current creating a network of non-linear journeys through the history of audiovisual language, art and architecture.

The spectacular development of digital techniques has brought about a series of mutations affecting the definition and design of space. These changes are in a historical perspective of technological, economic and social changes. One of the most striking phenomena of the architectural production process digitization is the adoption of the screen as the main tool of design, production and communication [6]. Drawings on paper or tracing paper, which were the traditional support and could have important dimensions, are replaced by documents which correspond to the size of the screen. The designer has a visual as well as mental conception of space. We can investigate the relationships of thought, tool and gesture to tools such as brush, pencil, pen, mouse, electronic pen, camera and video camera. The analog creative gesture of drawing and painting has been enriched with the automatic procedure of photo and video shooting. Digital design reintroduces analog gesture (mouse, electric pen, touch screen) but with the interposition of language (programming) between the hand and the iconographic surface. Thus, a new codification of communication based on the modalities of interaction (gesture, index, metaphors) has emerged.

With the adoption of the screen as the main work environment, the user is torn between a cinematic relationship of immersion in the image and an architectural rapport where the user and the screen participate in the materiality of the physical environment. The course's fundamental methodology focuses on understanding the interconnection and interpenetration of spatial audiovisual syntax with spatial perception models.

3. Space conception models and audiovisual language

The study of the evolution of the conception of space, from the Renaissance to the present day, is essential to understand the characteristics of the current digital paradigm. From Renaissance to the digital era, basic space conception models could be defined as follows: a) The frontal contemplation of the Renaissance observer, b) Aerial views and maps, c), the Section d) The panoramic view of the 19th century Panorama buildings, e) Isometric representation, f) Collage, as the abolition of the privileged observation point, and g) Walking as a fragmented space experience by a mobile viewer [7]. Renaissance adopted the frontal contemplation of buildings and introduced the model of perspectivist representation, from a privileged point of view. Aerial views and maps represented the elevated view and visual control. The sectional plan offered a series of viewpoints inside a building and signalled the transition from the privileged frontal point of view to the different views of a moving body, creating a complex narrative space. Panorama buildings offered the 19th century citizen immersion and control over natural and urban landscapes, reflecting the desire of Romanticism to look beyond the horizon. Walter Benjamin analysed the events and social transformations that shaped a new type of a mobile observer in the nineteenth century metropole, the flâneur. This new experience of urban space is characterized by fragmentation and multiplicity, two notions that we find today at the heart of the digital space conception. We can trace these models in the digital paradigm undergoing transformation and reinvention.

The sociologist Alain Médam proposes a classification of cinematographic styles that offer a look at the city. He distinguishes four filming modalities, which produce "discourses" on

the city: the "panoramic" discourse, the "traveling" discourse, the "overprint" discourse and the spectator's "enveloping by the city" discourse [8]. The panoramic discourse imitates the movement of the viewer's gaze and head in the urban space and the gradual capture of the landscape. Traveling is the movement in space with a means of transport. Superimposition of views refers to the multitude of views and events in an urban environment. The envelopment of the spectator by the city is linked to the immersion in the space of a painted landscape as it is done in the building of a panorama. To the four modalities of Médam we could add two others: the bird's-eye view and the free trajectory. Aerial view symbolizes both global perception and control. The trajectory is closer to the experience and the path of the flâneur in the urban fabric.

Cinematic syntax is based on the plan, sequence and scene construction while audiovisual language diegetic codification has been standardised with cut, fade and dissolve effects. The audiovisual continuum can be extended or fractured by the audiovisual language techniques. Film and television space, both iconographic and narrative, can be organized: a) by temporal editing (sequence of consecutive spaces), b) by spatial editing (multiple layers of space) and c) by organizing the space of the frame itself (split-screen). We could search for analogies between audiovisual diegetic construction (scenario) and the architectural program.

The French filmmaker Éric Rohmer distinguishes three different types of cinematographic space [9]. The first type is the 'iconographic space', the space inside the frame. The iconographic space is the result of the composition of the image (scale of the plane, depth of field, relative position of the objects, etc.) and the organization of lighting. The 'architectural space' is the space that was in front of the camera during the shooting: cityscape, etc. It can be a physical space or a scenographic one (analog or digital). The 'narrative space' is the mental space which is the diegetic space. This space can be composed of different architectural spaces, as Lev Koulechof showed in his experiments of "creative geography".

4. From the architectural promenade to digital navigation

Contemporary urban environment offer a multiplicity of layers of information (social, historic, etc.) through material elements and display systems communication. Michel de Certeau approaches walking in the city as a process of "appropriation" and "a space of enunciation" [10]. It is walking people who bring the city to life, who are the authors of the "urban text" writing the city as a story – an ever fleeting and dispersing spatial patchwork of individual viewpoints and interpretations. Thinking space by means of events and scenarios seems to prevail over the static entities of traditional architectural conception.

Kevin Lynch was one of the first to apply the notion of mental map to urban wayfinding, based on the sensory clues of the environment [11]. Following Bernard Tschumi's theoretical approach, architecture has two terms, space and experience, which have a complex relationship of confrontation and complementarity [12]. Tschumi focuses on activities, in the form of events, taking place in an area organized by an architectural program. In the same theoretical approach is inscribed Antoine Picon, theoretician of architecture, who considers that the production of contemporary architectural space is based on the sensory dimension

of our experiences which are often assimilated to events. He extends the use of the notion of the event to the digital space of the screen and it states that the use of the computer also goes in the direction of a reduction of the architecture to the status of event [13].

We can establish analogies between the introduction in architectural thought of notions such as the movement of the human body in physical space and navigation in the digital space, between the design of architectural space by means of events and scenarios and the structuring of audiovisual and interactive storytelling. Moving the user in the digital space is a fundamental feature of computer culture, and the digital space is always a navigational space. The experience of the walker-observer in the nineteenth-century urban space has evolved from the Architectural Walk of the Modern Movement, the spectator's movement in kinetic art and installation art, to the navigation in a digital environment.

5. A synesthetic approach to space

Over the last three decades, and at an ever-increasing rate, architectural thinking has shifted to a holistic sensory approach in situ, adding to the dominant visual experience the neglected: hearing, touch, taste, smell [14]. Since the 70's, sound ethnography invites us to understand sound as a modality of knowing and being in the world, looking at sonic phenomena and events as domains where cultural knowledge can be made. The word 'soundscape' was coined by the composer R.Murray Schaffer to identify the sounds that describe a place, creating its sonic identity. Schaffer is best known for his World Soundscape Project, and his book The Tuning of the World [15].

Similar ideas, to those of anthropologists, have been expressed in the field of contemporary architectural theory, which moves away from the conception of an absolute and objectively defined space to a subjective approach, where human experience is the basic element for attributing sense to space. Like a landscape, a sound landscape is both a natural environment and the way it is perceived. It is a world and at the same time the cultural context built to understand it. The cultural dimensions of a soundscape include: a) scientific and aesthetic listening methods, b) the relationship of the listener to the environment and c) the social conditions that determine each person's hearing.

6. Projects

Students are encouraged to investigate all types of representation techniques and audiovisual genres through a series of projects, both individual and team. These projects are developed and elaborated with the support of the Lecad Laboratory of the Department of Architecture [16]. Student projects are organized in 5 categories:

The organization of a diegetic construction inside the photographic space. The investigation of spatial representation with the textual and diagrammatic description. Today diagrams are implied in seemingly every aspect of architectural and design fields.

The creation of a built or urban space narration through a series of a defined number of

photos, each one taken from a different point of view, with a different size of the plan (general, medium, close). In certain cases, one of the photos should be a reflection of the building and another one a close up of a surface or detail. In a second phase, these 5 photos are combined in a PowerPoint presentation with specific sounds pertinent to the place.

A trajectory in the urban tissue following a specific personal 'program'. In the course of walking, the student feels and reflects upon soundscapes and senses of place which are interweaved in the narration of instances of life episodes. The city is thus mediated as a palimpsest of lived memories, senses and trails.

The creation of a radio emission describing an approach to the city image. It can be based on personal experience or on textual documents (newspaper, book, etc.).

The creation of an audiovisual glance at the city. Students work in groups using green screen technique in the Lecad studio in order to combine fragments of radio emissions with images of the city.

7. Epilogue

It is surprising to find that, considering the centrality of representation techniques in space design, a very limited number of theoretical contributions are dedicated to the field. It therefore seems timely to revise and readdress the subject in the light of recent developments and evolutions. We should raise new questions and introduce some new ideas on the future of the architectural design.

Antoine Picon believes that the transformations that digital technologies gave rise to architectural design can prove to be as radical and lasting as those brought about by the dramatic change in Renaissance. The presence of new information and communication technologies is now a given. We are in a phase that requires a redefinition of the imaginative tools but also a re-examination of the relationship between the materiality of architecture and the intangible information and potential space.

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Phenomena & Abstraction

1st Year-Design Studio as Research

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Abstract

This paper explores the research potential of the first-year design studio at Ariel University. It seeks to show how the design studio, by embracing phenomenological hermeneutics, has become increasingly theoretically rich and a worthwhile vehicle for the production of knowledge and the comprehension of a range of issues. In the studio the importance of interpretational discourse derived from the understanding that the space in which we live is in itself an interpretive domain is emphasized. As such, it enables us to discuss how each individual places himself in the world differently from or similarly to other individuals. In the studio we embrace phenomenological hermeneutics as a way of thinking, asking the students to challenge to the nature of knowledge and to accept the possibility of several of "truths." During the studio, we move away from positivist certainties and as a result innovative ways of seeing design problems emerge. The course investigates the question: ''What are the phenomena of a path?'' The investigation is carried out with the aid of a few short exercises, which culminate in a final project consisting of a case study of a concrete place that the student chooses.

1. Introduction

The nature of knowledge and scholarship in the design disciplines is categorized as "doing of creative works." It has therefore always occupied an unusual niche within universities. While research activity within design has traditionally conformed to either positivist research paradigms or the formal scholarship characteristic of the humanities, the process of design itself has generally not been located within the context of research. This is the case despite the richness of knowledge generated in design studios, which should be considered an existing forum for inquiry.

Since the late twentieth century, however, the concept of what constitutes legitimate research has been evolving. The first major step away from the belief that research belongs solely to the scientific domain came with the early qualitative work on grounded theory. [1] In addition, a history of design research already exists. While the rationalist hegemony claims that research belongs to a positivist paradigm, scholars in the creative arts are applying postmodern insights to the design process. Building on advances in cultural studies, phenomenology and hermeneutics, they are doing innovative reflective research on their disciplines. It is within this context that the concept of "Design as Research" has emerged. [2]

This paper explores the research potential of the first-year design studio at the School of Architecture at Ariel University. It intends to show how by embracing a phenomenological and hermeneutical orientation the studio becomes increasingly theoretically rich and a valuable vehicle for the production of knowledge on a range of issues. Hermeneutical practices facilitate the learning process and the production of knowledge in and outside the classroom.

2. Methodology: The Studio

The first-year studio aims to uncover the abstract universal concepts that underlie design activity by embracing phenomenological hermeneutics. These universal concepts also form the basis for our cultural and public domain. This process broadens the scope of planning activities, allowing them to transcend the technical sphere. The emphasis on bringing critical discourse into the design studio is derived from the understanding that the space in which we live is in itself an interpretive domain. As such, it enables us to discuss how individuals are situated in the world in relation to other individuals. Phenomenological hermeneutics is embraced in the studio as a way of thinking, leading students to challenge the nature of knowledge and consider the possibility of several "truths." Over the course of the studio, students move away from positivist certainties toward innovative ways of approaching design problems.

Phenomenology is an attempt to understand things from "inside the world." This method is emphasized in the studio because it encourages students to question what is commonly called reality and discover that reality is an incredibly sophisticated and complex mixture of ideas and half-finished thoughts. Most people take for granted what they understand as reality; however, this course demonstrates the value of questioning the very foundations

of our knowledge structures. Phenomenology provides a global and consistent conceptual apparatus, which is relevant to the questions that motivate architectural work because it leads students to draw connections between the places they live and their experience as individuals embedded in a cultural network. The studio's dynamics are crucial for developing ways of thinking and designing, which will be relevant in a professional as well as an academic context. There is an emphasis on the differences between the straightforward planning approach and the poetic approach, which deviates from or goes beyond the planner's objective goal.

In Western culture design is usually associated with novelty. Novelty is frequently linked, in turn, with originality, which relates the act of design to bringing something new into existence. But are designs really ex nihilo creations? Posing this question in the classroom leads students to unearth the layered history of design practices. The class begins their investigation by connecting contemporary design practices with their Greek roots.

In Greek, the word design σχέδιο (schedio) is derived from the word σχεδόν, which means nearly, almost, about or approximately. The Greek meaning of the word concerns a certain incompleteness or indefiniteness. At the same time, it also involves possibility, expectation or anticipation. As the architect Kostas Tzerdis notes in his etymology of σχέδιο, design involves something we once had. According to the Greeks, design entails a loss that happened at an unspecified time in the past and it is "linked indirectly to a loss of possession and a search into an oblivious state of memory." [3]

By investigating the etymology of design, students begin to understand the meaning of the word more fully. The course emphasizes the connection between the two aspects that the word design signifies: (1) the search for something which is lost, and (2) the anticipation and novelty, such as creating a complex temporary structure that encompasses a past, a present and a future, that is interwoven through interpretive action.

Next, the class begins to contemplate the question of origin, or in Martin Heidegger's words, the question of the origin of the origin. This question simultaneously maintains a principle of interpretation and development. Thus, investigation is not directed at the origin or basis as something to be found in the past, but rather as something directed towards the present. The concept of origin has a double definition. That is to say, the temporal nature of origin is something that is absolutely primary and basic, but at the same time completely new. Hence, students begin to understand this concept as one that links the present to both the distant past as well as the future. Origin has an underlying contradiction since the occurrence is revealed as new. But at the same time, it is already known to exist. Its initial appearance will be the one through and by means of which one may relate to a certain element from the past. It is a form in which this element once again incessantly confronts the world in an interpretative manner.

In *The Origin of the Work of Art*, Heidegger attempts to clarify the question of the meaning of origin, where it comes from, what it is and how it is created. From the beginning we encounter a paradox, as Heidegger tries to consistently and unambiguously answer the question of origin. He presents the problem in the context of a work of art. What are we asking about

when we ask about the origin of a work of art? Immediately the answer emerges that the work of art derives from the artist's activity, thus originating with the artist. But what makes the artist an artist? The answer lies in the nature of the work of art. Hence the paradox: the artist is the origin of the work of art, and the work of art is the origin of the artist. Contemplating these questions leads students to become aware of the cyclical progression that defines the hermeneutic circle, and which is essential for understanding Heidegger's thinking. When students trace the inherent paradox in his answer, they discover that they cannot speak about origin as springing from an initial point. Rather individuals are always already in the world, within the contexture. [4]

Understanding begins after we are in the world. There is no starting from the beginning, no absolute point of departure. Already being-in-the-world enables us to comprehend the connections between the two ways of understanding the double meaning of the word design. It is both something we once had but do not have anymore -belonging to the past, the origin, the source- but it also has a new dimension of possibility, expectation or anticipation. Innovation derives from interpretation, which is what creates something new. Better yet, it adds a new layer of meaning to an earlier one, to the original "text," describing something that is lost and that no longer exists [5].

Interpretation in architecture and design is an activity directed towards change in the spatial object. It is supposed to shed light on the lost dimension, revealing the new qualities and meanings it wishes to bring together in a unified whole. Successful interpretation of architecture enables others not only to take part in architectural spaces, but also, to see these spaces and their materials differently.

The act of interpretation is essentially creative. Its nature -that is, the problem that evokes the commentator's concern regarding the proposed interpretation- is not dependent on fixed principles or methods. Rather, it is unique to the manner in which the commentator perceives the object to be unique. This activity, which is individual in essence, contains two aspects. The first touches upon the object interpreted and the second on the commentator as an individual. Every object contains different elements that preoccupy different commentators. Interpretative questions are unique to each particular object, and there would be no point in transferring interpretative solutions systematically from one object to another. Each object raises different questions, which in turn, suggest different answers.

By interpreting architecture, students look at objects anew. Their interpretative gaze is both unique to the object and to the questions that they raise as commentators. Students are faced with the choice of what to interpret. They must contemplate the importance of the thing being interpreted, the value of the ideas expressed within it, and its status a cultural pillar. Yet, on the other hand, students must also be aware of the fact that their interpretation discloses their perceptions as interpreters. The act of interpretation allows them to express their views. During this process students begin to understand that interpreting architecture adds knowledge to the world in which they live.

The course poses the question, "What is the essence of the "path" as a phenomenon?" It approaches this question from three different perspectives: theoretical, abstract and

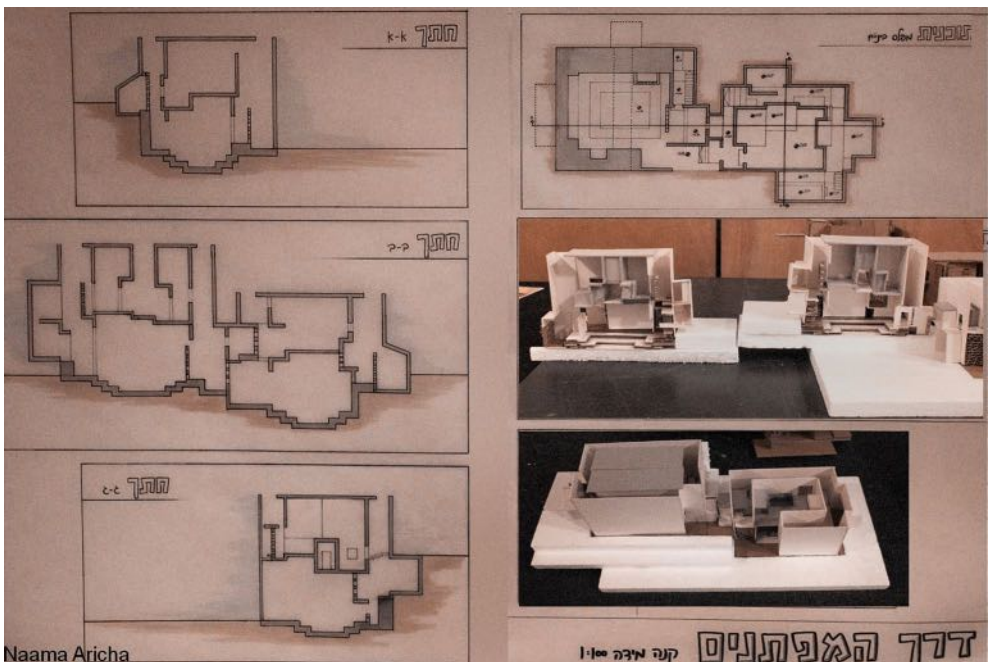


Fig. 1: The path as "threshold" (a) section through the path; (b) model and plan of part of the path.

interpretive. Each student completes short exercises that culminate in a final study of a specific design context of the student's choosing. The discourse on the phenomenon of the "path" emphasizes content designed for movement and dwelling. The "path" constitutes a sign for future 'place-taking' and, as such, it is engaged with architectural and existential considerations. It creates an ethical relationship in space. There are three main research themes based on phenomenological hermeneutics in the studio: Metaphor, Conflict and Movement. Each student explores these themes in their project. In what follows we will reflect on a student project from the course.

3. Metaphor

Students are taught to think metaphorically. Metaphor facilitates creative acts such as reflective design and is crucial to applied hermeneutics. The power of a metaphor lies in its ambiguity and its ability to provide a novel perspective on the familiar or commonplace aspects of the built environment. In other words, the metaphor, because of its incompleteness, requires subjective participation to uncover its meanings. By using metaphors, the design student challenges the public's uncritical acceptance of codes. Students are tasked with defamiliarizing the familiar in order to reveal perspectives that they previously ignored. As a form of research, interpreting metaphors not only requires a strong theoretical framework. It also forces the student to become an active researcher.

In the investigation of the essence of the "path" discussed here, the student began her research by considering the "threshold" as a metaphor, which enabled her to visualize the whole building façade as an architectural space. The student discovered a relationship between the house and the city's public space. Thinking about the threshold metaphorically allowed her to think of it as more than merely as an opening that enables the passage of contents from an interior to an exterior. According to the student, the doorstep is a place between the interior and exterior and vice versa. It is also the condition for the creation of interior and exterior.

4. Conflict

In the studio, the students were challenged with using architectural thinking to define the dwelling spaces in which the tensions, the extreme opposites between outside and inside, between public and private, between open and closed, are reflected, making themselves present to one another. In this context, conflict is a positive phenomenon, one that enables the student to interpret architectural situations. Architecture is at its core a space of conflict. A state that exists conceptually prior to any explicit conflict emerging in specific circumstances. (Fig. 2) This understanding, forces the architect to interpret the relations between at least two different phenomena, which are in a state of tension.

In her project, the student chose to disconnect the façade from the house. (Fig.3) She defined the wall as a space that has volume. Life in the house exists between the original house and

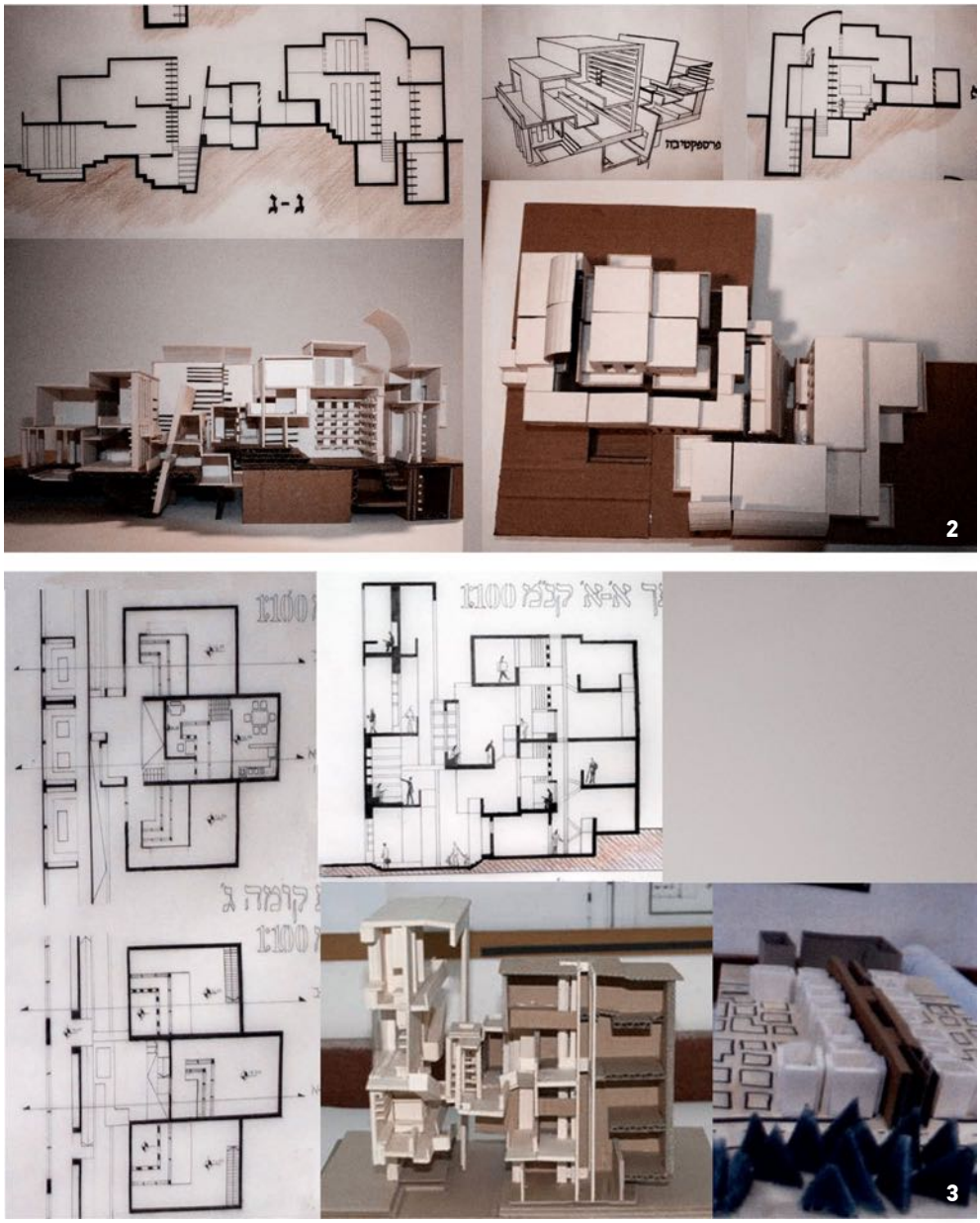


Fig. 2: The path between the "seminary" and dwelling
Fig. 3: The path between the "library" and dwelling

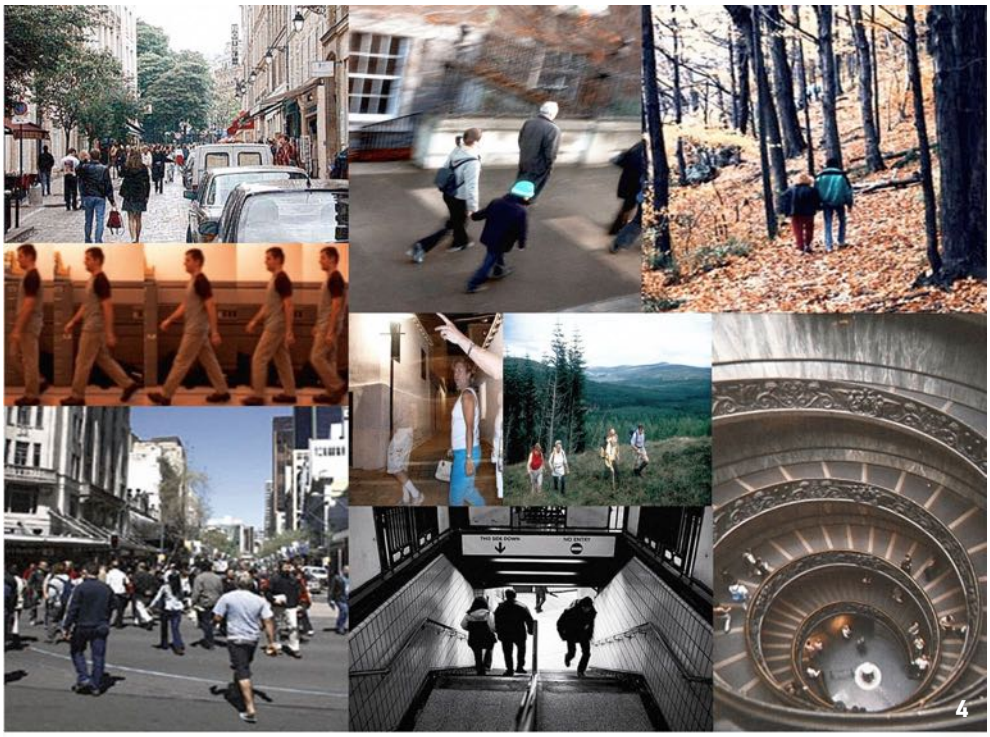
the space of the façade. Thus, the conflict between the domestic space and the urban space is intensified. It is a space, which was at first defined only at the front of the house, only at the façade, almost like a flat screen. As a result, the surface that it faces and that is in dialogue with the public is expanded. This raises various possibilities for those dwelling in the home and enables the constitution of changing identities. This structure differentiates the interior from the domestic realm.

5. Movement

The third concept we used to research the phenomena of the "path" is movement. (Fig.4) Movement of the body requires that the architect investigate spatial relations. The moving body is the intermediate object that experiences space. Familiarity with a place begins with the experience of our physical existence-in-place. My body takes me into places. While we usually do not pay attention to the precise role of our body, as soon as we do, we cannot ignore its importance. Our body, the moving body, is used for constructing and defining place. Movement allows the investigation of spatial and existential relations and connections between metaphorical and conflictive relations. (Fig.5) The treatment of the façade as the doorstep changes the number of movements that the body takes. The first is movement in the street. The second is movement from the street into the domestic space. These movements, from one interior to the other, from an exterior to an interior, from an interior to an exterior and so on, enable situations of different spatial consciousnesses. Without bodily movement between different spaces there is no possibility to accumulate conditions of consciousness.

6. Conclusion

Creativity and originality are essential aspects of design. Originality, however, challenges the requirements of positivist research that assert that the proof of validity and rigor is explicability. In challenging positivist research, hermeneutic design practices emphasize the originality of an interpretation rather than its repeatability. In design, the replicable or repeatable is most often associated with values that are taken for granted or supposedly innocent or untheorized, like the façade, the threshold or movement. This is the departure point for our studio, in other words, these are exactly the values that we attempt to challenge. Such replications lead to the very stereotypes that most designers seek to avoid. The first-year design studio consistently exposes stereotypes through practices of critical interpretation. The means through which the design studio works reveal the hidden or disregarded"truths" of contemporary society.



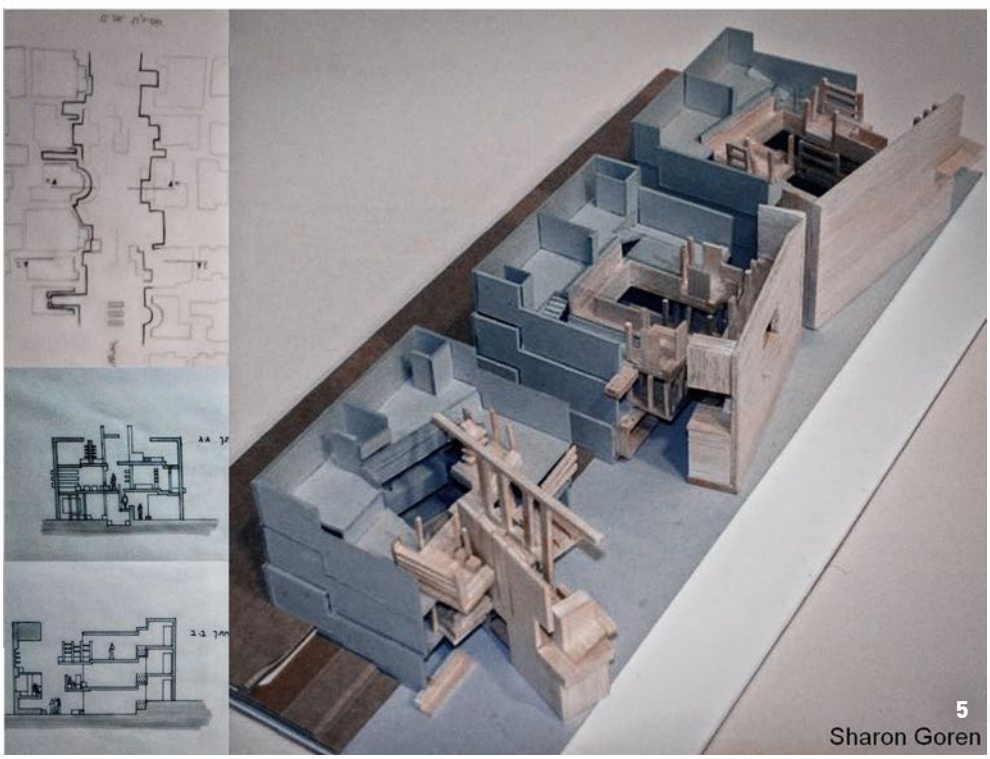


Fig. 4: Body movement creates places

Fig. 5: Body movement creating new path - discounting the facade of the building

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A Persistent Pedagogy

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Abstract

The incorporation into beginning design pedagogy of Bauhaus methods, the nine square grid problem, and its offspring cube problem, intended the inculcation of representation into beginning design as a means of provoking a "mental or abstract order" in which students recognize abstraction, design with abstraction, and develop a habit of thinking abstractly[1].Abstraction segregates ideas from their realization. Making architecture is different than executing academic abstractions, be they theoretical, analogical, or representational. Steven Temple states that working abstractly dissolves workmanship as substantive to design because abstraction is wholly speculative - nothing tangible is realized[2]. Engagement in cerebral activity {captivity}, without being grounded in the gravity of physical reality hinders understanding. It is fundamental to acknowledge that architectural ideas are easily misunderstood when limited to the confines of abstraction. Abstraction meaning the inherent limitations associated with various means of representation or the distance between the idea and its manifestation. Education, by its nature is abstract. Learners are usually separated from the actual discipline studied. The creative disciplines push abstraction to another level. For a design educator, abstraction is a proven useful surrogate. Art students use abstraction differently than architecture students. Art students make art. Architecture students are unable to make architecture because architecture is big, expensive and requires an enormous team of participants and a considerable amount of time to manufacture. Abstraction is adopted as a means of architectural education, out of necessity. The degree to which we rely on it, expect it and believe it is what will be questioned.

1 Bernard Hoesli, in Carragonne, Alexander. *The Texas Rangers*. Cambridge: MIT Press, 231

2 Stephen A. Temple, *Questions of Abstraction in Beginning Design*, the Association of Collegiate Schools of Architecture and the 107th Annual Meeting, March 2019

1. Abstraction abstracted

Architectural education is a complicated beast. As professors and administrators, we can usually offer a sound rationale for our curricular decisions and make sure the creative juice distilled in our design studios consistently fill the air with a sweet pungent aroma. In regard to the beginning of an architectural education, the degree to which we utilize abstraction deserves our persistent consideration. Professor Stephen Temple stated in his essay, Questions of Abstraction in Beginning Design for the 107th Annual ACSA Meeting, "working abstractly dissolves workmanship as substantive to design because abstraction is wholly speculative - nothing tangible is realized". It is true that an abstract approach segregates ideas from their realization. Making architecture is a different phenomenon than executing abstract architectural exercises. Thinking about architecture is more of an abstraction than making some kind of a representation of architecture. Engagement in cerebral activity {captivity}, without being grounded in the gravity of a physical reality is of course an abstraction of architecture. It is fundamental to acknowledge that architectural ideas are easily misunderstood and potentially rendered irrelevant if limited to the confines of abstraction. By abstraction I mean the inherent limitations associated with various means of communication/representation - the distance between the idea and its manifestation. This awareness is neither a positive nor a negative assessment.

Education, by its very nature is abstract. Learners are usually separated from the actual discipline they study. Educators in the creative disciplines bring abstraction to another level, usually with good intention. For a design educator, abstraction is often a useful surrogate. Art students have a different relation to abstraction than architecture students. Art students make art. Architecture students are unable to make architecture; at least in the normative material sense because architecture is big, expensive and requires an enormous team of participants and a considerable amount of time to manufacture. Abstraction is adopted as a means of architectural education, out of necessity. The degree to which we rely upon it is what is being questioned.

Abstract art is a representation ...of something else - representation is a surrogate. This is not a pipe. It is merely a representation of a pipe. This relation is more important today in the education of an architect than ever before. It is far too common for an eighteen-year old to believe in a representational image of anything because his or her reality is basically constructed on the premise of superficiality. "Images are a pervasive force in contemporary society". [1] Superficial steadfast surfing is the life most privileged young people live.

2. Rewind

To come to terms with design education's reliance on abstraction, starting at the end might prove helpful. At the end of a semester, reflecting on the previous fifteen-week architectural adventure, we can evaluate the experience with a question about 'enough' because *enough* is an abstract measure and a measure of abstraction. To what extent was the design studio abstract? Was the semester experience broad enough? Was it technical enough? Was it

Fig. 1: A comparison of academic art and architecture
Fig. 2: This Is Not a Pipe by René Magritte, 1928
Fig. 3: Nine square grid
Fig. 4: Class demonstration ART 280, spring 2015

experimental enough? Was the semester critical enough? Did students produce enough models? Did students employ enough tools and materials? Did we research enough? Was there enough process/evolution? Did we push our ideas far enough; hard enough? Did we learn enough? Did we play enough? Because abstraction is also a representation, we are obliged to ask if the representation is *enough* of a surrogate to be considered a valuable experience? Merely engaging in a surrogate activity or even being successively productive does not render the abstraction meaningful, which is why we ask about *enough*. While every studio cannot do everything, if an after the fact evaluation determines there was not *enough*, our instruction unquestionably dwells on the negative side of abstract.

My favorite Breaking Bad character, Walter White Sr., also known by his clandestine alias, Heisenberg made a useful consideration in a conversation with a student in his high school chemistry class. In season two, episode seven, one of Hank's students, in a private lesson due to having flunked the last test says that his grade of 58% was 'close' and he wanted a two-point break so he could pass chemistry and not have to go to summer school. Hank responds by asking the student, what is close? 'Close' is another term of relativity similar to our using the term 'abstract' or enough. Mr. White continues the conversation by saying to the student that there is no 'close' in science. Close did not put a man on the moon. I wonder if we should be thinking the same way about abstraction in architecture?

'Enough' is not only the measure of abstraction, it is also a datum beyond which we can strive. When a student is satiated with their studio performance, they can continue forward to free themselves from the captivity of the abstracted. Students can exercise a consciousness that pushes their position forward responsibly. M.C. Richards has a lot to say about education. "You don't need me to tell you what education ls. Everybody really knows that education goes on all the time everywhere all through our lives, and that It is the process of waking up to life. Jean Henri Fabre said something just about like that, I think. He said that to be educated was not to be taught but to wake up. It's not that we want to sleep our lives away. It's that It requires certain kinds of energy, certain capacities for taking the world into our consciousness, certain real powers of body and soul to be no match for reality. That's why knowledge and consciousness are two quite different things. Knowledge is like a product we consume and store. All we need are good closets. By consciousness I mean a state of being awake to the whole world throughout our organism". [2] Richard's point is more poignant today than when she wrote it in 1964.

I hope we all understand that the bigness of design and enormity of architecture is not about the celebration of ideas. We inhabit the design studio, not an idea studio. Simply stated, a design studio can celebrate either *potential* of ideas or *refinement* of ideas. Both options have merit, but the two attitudes cannot be fairly compared as they each have their own unique position in relation to abstraction. A design studio including both extremes might be an educational anomaly? If we are fair to all involved, our studios should come with a definition for the parameters of the playing field so we do not wander out of bounds and add to the imminent confusion.

"Potential, like so many other words, has had its meanings separated out, and has come, in our day, to be both potency and potentiality - that Is to say, both the power present and the

power latent, that can but has not yet come into being. In Latin these are the same word. And this is a wisdom. For the potentiality is also a present power with which we must deal and to which we must speak. A condition of generative potency, a possibility in persons and things, not yet visible In force but present in seed". [3]

Even though I am thrilled about the pursuit of potential, of brilliant ideas, of novelty and freshness, and of all the variation/experimentation, it can undeniably be understood as being relatively abstract in its denial of refinement. It is abstract in the sense that it represents to a certain extent, but not the same extent as something that has gone through a process of refinement. Similarly, the thinness of a diluted divergence is as abstract as a vague idea. If design is the objective, thinness must be overcome to address a substance that can only be seen with a considerable temporal focus or convergence. For the sake of architecture, abstractions will benefit when exposed to the rigors and materiality of the physical world, where the breadth is narrowed and considered objectively. A potter describes this laborious point of view: "I learn through my hands and my eyes and my skin what I could never learn through my brain. I develop a sense of life, of the world of earth, air, fire, and water - and wood, to add the fifth element according to Oriental alchemy - which could be developed in no other way. And if It is life I am fostering, I must maintain a kind of dialogue with the clay, listening, serving, interpreting as well as mastering. The union of our wills, like a marriage, is a beautiful act, the act of listening and turning a pot on the potter's wheel; and the sexual images implicit in the forming of the cone and opening of the vessel are archetypal; likewise, the give-and-take of the tools, the intelligence of the fire". [4]

However, an exclusively convergent exploration is also not conducive to design. It belongs more to a production process than a design process. Convergence by itself is tunnel vision; shallow, technical, practical, conventional, almost predictable and is unwilling to accept alternatives if and when presented by a design process. I will mention again that it is fundamental to acknowledge that architectural ideas are easily misunderstood if limited to the confines of abstraction. Abstract representations are misleading and lacking context, dimensionality and substance. Abstraction has a covert dark side in regard to both potential and refinement. We can get lost on either side of the spectrum and confusion is omnipresent.

3. Attitude

There are many reasons, schools of architecture intentionally avoid a model of normative architecture at the beginning of their curriculum, to instead invest time in analogous or complimentary architectural experiences such as playing, tinkering, experimenting with tools, materials, and design principles for the sake of grounding ideas in a space that exists outside, but related to conventional architectural matters. We know well that this is a healthy introduction to thinking about architecture. However, a fantastical exploration into an analogous direction is loaded with abstract complications.

The unique condition of a beginning design education often compromises its mission with an incongruous temporality. While I will not address the specifics here, it is blatantly obvious

in the digital arena. It pains me to see the lack of sensitivity, prowess and understanding by students who know well how to negotiate a mouse, but not a pencil; can operate a laser cutter, but not a bandsaw or even a matt-knife. It was John Dewy in, Art and Experience who said that aesthetic quality is felt. He wanted, "to restore the continuity of aesthetic experience with normal processes of living. The unity of experience provides the basis for aesthetic quality". [5] Dewy has many criteria to satisfy his definition of experience, the least of which has to do with directness. There is no doubt how he would evaluate our contemporary engagement with life phenomena. Digital convenience, speed and unlimited accessibility are no substitute for a tangible directness. Dewy goes on to say, ''The one who is too lazy, idle, or indurated in convention to perform this work will not see or hear. His 'appreciation' will be a mixture of scraps of learning with conformity to norms of conventional admiration and with a confused, even if genuine, emotional excitation". [6]

Our digitally proficient students have adopted an attitude about making that privileges efficiency to such an extent that any semblance of quality often remains unrealized. An efficient exploration is not granted the necessary gestation and iteration to mature and conclusions are lauded prematurely. Curricula are routinely known to leapfrog over valuable experiences in favor of the latest fashion or perhaps to give the client or customer that which she expects to find in an architectural education. There is potential danger in any such curricular misalignment because it may never be corrected over the short expanse of a four or five year degree plan. Design is not an efficient proposition. There are no short cuts, regardless of which tools are employed. Elizabeth Gilbert defines her position in the creative process as such, "I'm a mule, and the way that I have to work is that I have to get up at the same time every day, and sweat and labor and barrel through it really awkwardly". [7] M.C. Richards explains it like this: "The transformations that await us cost everything in the way of courage and sacrifice. Let no one be deluded that a knowledge of the path can substitute for putting one foot in front of the other". [8] And Jim Dine was quoted as saying, "My interest has always been in ... people who are in that tradition of difficult work, of laboring over something and finally getting something out of really hard work". [9] A studio activity predisposed to reap a predictable product without suffering the toils and tribulations of a meaningful design process is abstract. It is thin, false, and only a masquerade in regard to design.

4. Specifically abstract

Professor Temple stated that the "beginning design pedagogy of Bauhaus methods intended the inculcation of representation into beginning design as a means of provoking a 'mental or abstract order' in which students recognize abstraction, design with abstraction, and develop a habit of thinking abstractly". the nature of abstraction for better or worse, is ultimately a matter of limits. I think of these as human limits. In regard to the human condition, we are complex creatures; so much more than our intellectual prowess. This intellectual bias has proved itself limiting, distracting and dangerous for far too long. Human beings are well equipped with many helpful alternative attributes besides exercising reason.

In notes from 1965, John Hejduk describes the invention of his studio as follows: "The Nine-Square problem is used as a didactic tool for the introduction of architecture... A[n] understanding of elements in their primary essences is revealed; the idea of fabrication emerges. The Nine Square Problem starts from the subdivision of a square into nine others. The student develops a plan, an isometric, and a model proceeding through a series of exercises. In so doing, according to Hejduk, elements (grid, frame, post, beam, panel), relations (center, periphery, field, edge, butt, interlock, compression, tension, extension) and conditions (measurement, number, black, white, gray) are revealed and tested." [10]

This nine square grid project covers a lot of ground. I am not convinced that working/thinking ones way through Hejduk's exercise accomplishes much of what he identified because the abstraction is plagued with limitations and fraudulent clarity. I believe it to be a beautiful theoretical speculation that cannot survive the reality of the early 21st century. It is a presumptuous scientific exploration packaged as a panacea. I would argue that while the nine squares do intend to expose students to a myriad important tasks, it is still burdened by an excessively thoughtful bias. Such an angle regards the beginning design student in a way that is perfectly in tune with the prevalent status of most freshman college students. It is way too comfortable, familiar, and easy. The beginning of a design education, now more than ever before will have more of an impact on students when it transcends the familiarity of their brief sheltered lives and offers a challenge to engage an uncomfortable circumstance that enables them to discover something they were previously unaware because it has been hiding beyond their ˈkəmfərt zōn. It might be helpful for architecture students to confront a messy scenario with a complexity that demands a sincere engagement to discover a semblance of success; an engagement that transcends the passivity and complacency of reason to invest their humanity as wholly (holy) as possible.

"Because I am a potter, I take my image - centering, from the potter's craft. A potter brings his clay into center on the potter's wheel, and then he gives it whatever shape he wishes. There are wide correspondences to this process. Such extensions of meaning I want to call attention to. For centering is how we may seek to bring universe into a personal wholeness, and into act the rich life which moves so mysteriously and decisively In our bodies, manifesting in speech and gesture, materializing as force In the world the unifying energy of our perceptions." [11] I too am a potter and I have adopted a pedagogy of demonstration to combat the expansive space of abstraction. I teach my pottery students how to throw on the wheel just like I teach my drawing students how to transform a blank sheet of paper. While the students obviously recognize the value of demonstration, my colleagues do not want anything to do with it. The reasons of their objections will be the subject of another essay. I have countless experiences with students that demonstrate an exponential learning curve because we found a way to get involved with education, physically. Cutting, marking, scribbling, dancing, posing, digging, pugging, walking, meditating, etc. prove time and again that thinking and learning are not exclusively cerebral activities. In my observational drawing class for example, we strive for empathy in our relations with subject matter and stress that seeing/drawing is a synchronicity between the drawer and the drawn. In order to draw, the drawer becomes that which is drawn by transcending space and interacting with the subject matter in a sensual way by touching the subject with eyes that are like hands. No different

that when my pottery students reach for the pieces made by their peers in the pottery lab while excitedly asking, can I see this? Eyes become hands.

As design educators and as designers, we are all involved in a very important endeavor. Exercising creativity is serious business not for the weak-hearted or the craven. This enterprise is not about intelligence. It is not the smartest that win this race. Designers are fearless; maybe superheroes. Our aspirations are large. We are not gliding across the surface. This is about pushing ourselves so far, it physically hurts. It hurts a lot.

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Architectural Experimentation

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Abstract

Thomas Kuhn in the Structure of Scientific Revolutions presents the sequence of a Paradigm-shift in science: normal science – crisis – revolution – new normal science again. Normal science conforms the standards that are set by a 'paradigm'. I suppose then, that a 'normal architecture' exists and operates accordingly: it deals with architectural puzzles that are set by the dominant architectural and cultural paradigm, while researchers and students are devoted to it. Is it possible for architectural research to overcome the authoritative demands of the dominant paradigm and grow its body knowledge? We assume that this is indeed possible within architectural education. Since architecture schools offer the necessary space and time for (pure) research unaffected by external economic and social authorities, we can speculate that they embody the most prominent institutions for the growth and development of architecture knowledge. To clarify this, I put forth a working hypothesis. The hypothesis is plain and straightforward: architectural education in order to operate as such, should transcend training students at normal architecture – in the Kuhnian sense. It should rather aim for producing new regularities in the discipline, that is, the growth of the body of architecture knowledge. To explain, one should also learn to attempt to exceed the boundaries of the present recursive problems of the discipline: to pose new problems instead of focusing on solutions and keep answering the same questions.

1. Introduction

Architecture is a source of knowledge; it performs therefore on exploration and experimentation and is aimed at solving a limited number and particular types of problems. In that sense, the education of the architect focuses on the methods of analysis and synthesis regarding the normal and regular architectural problems of a given culture.

In the present paper I aim to discuss a possible theoretical guideline of the education of the architect without pointing at any particular teaching year. It is more of a direction than a model.

Thomas Kuhn in the *Structure of Scientific Revolutions* presents the sequence of a Paradigm-shift in science: *normal science – crisis – revolution – new normal science again.* [1] Normal science accumulates an amount of knowledge and concepts of a particular field. Its role is to solve the *puzzles* of a theory and as long as it is able give solutions, the scientific community should go along with that theory. But some puzzles cannot be solved. These failures in a still acceptable theory constitute the *anomalies*. However, when the anomalies, instead of being solved, accumulate one over the other and increase, the theory is in *crisis* and through climax an achievement and a *revolution* is needed for these anomalies to be solved. The growth of knowledge according to Kuhn is driven by such revolutions.

Normal science conforms the standards that are set by a 'paradigm'. "By choosing it [the term paradigm], I mean to suggest that some accepted examples of actual scientific practice -examples which include law, theory, application, and instrumentation together – provide models from which spring particular coherent traditions of scientific research." [2] Kuhn writes that the study of paradigms is what prepares a student to become member of the scientific society in which he will later practice. As happens in architecture, those whose research is based on shared paradigms are committed to the same rules and standards for practice. [3]

I suppose then, that a 'normal architecture' exists and operates accordingly: it deals with architectural puzzles that are set by the dominant architectural and cultural paradigm, while researchers and students are devoted to it.

Is it possible for architectural research to overcome the authoritative demands of the dominant paradigm and grow its body knowledge? Michael Hays for example, has written about the critical architecture of Mies van der Rohe which can grow its own knowledge and resist, rather than reflect, an external cultural reality. [4]

We assume that this is indeed possible within architectural education. Since architecture schools offer the necessary space and time for (pure) research unaffected by external economic and social authorities, we can speculate that they embody the most prominent institutions for the growth and development of architecture knowledge.

In that sense, I follow Stanford Anderson who demarcates between the profession of architecture and the discipline. [5] "By the 'discipline of architecture' I mean a collective body of knowledge that is unique to architecture and, though it grows over time, is not delimited in time and space." [6] Anderson gives Le Corbusier's *five points* as an "example of the growth of

architectural knowledge: new architectural opportunities, made possible by new technology, but nonetheless intrinsically architectural." [7]

2. Beyond normal architecture

To clarify this, I put forth a working hypothesis. The hypothesis is rather plain: architectural education in order to operate as such, should transcend training students at normal architecture – in the Kuhnian sense of the term. It should rather aim for producing new regularities in the discipline, that is, the growth of the body of architecture knowledge. To explain, one should also learn to attempt to exceed the boundaries of the present recursive problems of the discipline: to pose new problems instead of focusing on solutions and keep answering the same questions.

In fact, the use of these ideas is evident in Anderson's beliefs that architects must strive for the growth of knowledge in their field. [8] Anderson studies architecture's growth of knowledge, by applying other scientific methods of appraisal. Specifically, Anderson's interest in philosophers Karl Popper and Imre Lakatos stems from his belief that architect's problem was not to achieve a finite understanding or conclusion of architecture, but to make architecture knowledge grow. [9]

In the discussion that follows immediately, I will address the possibility to consider Stanford Anderson's qualified version of Lakatos' scientific research programmes, apart from a rational critical historiographical method, as a systematic direction on design teaching. However, I have come to believe that such an approach could be productive if complementing Anderson's view with others, such as Ian Hacking's view on the impact of experimentation on the growth of knowledge.

3. I. Lakatos' and S. Anderson's research programmes

As already mentioned, Anderson studies architecture as a system of research programmes. He aims for a method that will apprise architecture and offer "a potentially more detailed and rigorous manner of clarifying and judging competing practices." [10] He finds that method in Lakatos' *Methodology of Scientific Research Programmes*.

The most prominent attribute of Lakatos' methodology is the replacement of a single theory or hypothesis with a 'research programme' or a series of theories and hypotheses which eventually form a research programme. [11] The structure of the series is developed around its 'hard core' (or negative heuristics) which is irrefutable like the three laws of motion and the law of gravitation in Newton's theories and the positive heuristics which include problem-solving techniques. [12]

Crucial component in Lakatos' theory is that the scientific research programmes do not appear ex-nihilo, nor do they exist on their own. Instead, series of theories result from the work of one or more scientists, and are always in relation to other series theories developed or formulated by others regarding a particular question. [13] In Lakatos' words:

" [...] rationality works much slower than most people tend to think, [...] I also hope I have shown that the continuity in science, the tenacity of some theories, the rationality of a certain amount of dogmatism, can only be explained if we construe science as a battleground of research programmes rather than of isolated theories." [14], he continues: "Both Ptolemy and Copernicus worked on research programmes: they did not simply test conjectures or try to harmonize a vast conjunction of observational results, nor did they commit themselves to any community based 'paradigms' [...] Copernicus did not create a completely new programme; he revived the Aristarchan version of the Platonic programme. [...] Copernicus did not invent a new heuristic but attempted to restore and rejuvenate the Platonic one" [15]

This is what is revelatory for Anderson in Popper's and Lakatos' work, "that specialization and experimental research do not describe a scientific attitude *per se*, unless they are carried out in the face of testing and refutation provided by others." [16]

To propose an analogy, a particular architectural proposal constitutes a part of the genealogy of a research programme. It does not appear ex-nihilo. Indicatively, post-war architecture -such as Team 10 for example- position itself and worked on the early 20th century modernist research programme, evolving and establishing a new conception of architecture modernism. Likewise, 18th century neo-classicism appeared as the continuity of Enlightenment with the ancient Greek classical research programme.

In the context of architectural education students do not just transform some transcendental initial idea during the design process. In fact, within this framework there is no such thing as an idea coming out of nowhere. Students must be aware that they position themselves in line with already formed architectures. In Popper's view the social nature of science is what drives knowledge forward. [17] The task for the education of the architect becomes the study and the further development of already existing architecture research programmes.

4. Architecture models

Up until now my aim has been to argue in favour of the implementation of an educational methodology which does not aim on new architectural inventions, but acknowledges the importance of architecture history on the growth of architecture knowledge. Its objective would be the development of new series of architectural proposals rather than isolated ones.

Nonetheless, Anderson reduces architectural design into theory. He writes: "whether one thinks of a single work of architecture or certain sustained patterns of work by one or more architects, it is not implausible to think of something like a 'hard core' that sets and maintains the direction of the work. Other architectural projections or hypotheses might well be adaptable in the way of Lakatos' auxiliary hypotheses, adaptable in order to maintain a coherence between the hard core and the empirical conditions." [18]

Regardless of the replacement of single theory with a research programme, both Lakatos and Anderson follow Popper believing that bold hypotheses formed in theories or research programmes drive knowledge forward, the laboratory work comes later.

One can conceive architectural education training students to form bold architectural hypotheses, yet in an architectural way˙ that is, laboratory experimental work using architectural methods.

Hence, architecture intervention within the framework of architectural education is treated as theory in the scientific sense of the term: theory comes from the Greek word *θεωρία* which means 'speculation'. Philosopher of science Ian Hacking uses the term 'speculation' to express a cognitive representation of something interesting which portrays a distinctive aspect of the world. [19]

However, Hacking reminds us that between speculations and experimentation there is an activity called *construction of models*. He gives the following view: "(a) phenomena are real, we have seen them happening. (b) theories are truths or in any case they target truth. (c) models are mediators which transfer some views of real phenomena and connect them with the theories that govern phenomena." [20]

Architectural education is grounded on the creation and the study of models not theories. Reality is informal and hence more dynamic than its descriptions. Though, these models are abstract, yet real, since it is true that a cognitive model does not function only as a representation of reality but as a mode of action in its own right: "What models have in common [...] is that they are deliberately constructed representational artefacts; and as such they are, in all their modes, the means by human consciousness presents itself with its own objects, i.e. in which it becomes self-consciousness. [...] consciousness of one's own activity, of the practice which connects is with and helps to constitute the world, and through which we come to understand it, to know it; in effect, to propose, to conjecture, to entertain and to test what may be true about it." [21]

5. Applied architecture and the production of 'effects'

As yet, I am arguing that architectural education must surpass its theoretical constraints. Concerning that, Hacking mentions Steven Hawking's lecture at Cambridge entitled *Is the End in Sight for Theoretical Physics?* where Hawking claimed that a single unified theory will leave the largest part of physics intact and physicists should work on applied physics by examining case by case apart. [22]

Respectively, within the context of architectural design, I am making the paradoxical distinction between theoretical and applied architecture.

When speaking of applied architecture, I am referring to those architectural actions or design processes, that is to say, architectural experiments, which eventually come up with something exceptional that is not expected in advance.

To explain I will recall Hacking: the central claim of his book *Representing and intervening* is that experimentation has a life of its own which drives scientific knowledge forward. My special interest lies where he explicitly states that scientists frequently create phenomena against the common image, that is, presenting them explaining existing phenomena. Hacking

is interested in phenomena that can become exceptional anomalies rather that already known regularities. [23] When physicists conceived an explicitly didactical phenomenon, they named it 'effect' – 'Faraday effect', 'Hall effect' for example. [24] These are phenomena which were waiting for us to be discovered. Scientists experimented and intervened to the predictability of nature and produced new regularities˙ such phenomena exist in the virtual sphere and waiting to become actual.

In that sense, architectural education should aim at the production of 'architectural effects' by cultivating students the practice of experimentation on form.

Moreover, some of these scientific experimental effects such as the 'Hall effect' cannot exist outside specific laboratory conditions and apparatuses. In nature there is only the complex, for which we have the ability to analyse. We manage this by distinguishing the different laws of physics. Laboratory can present clear, autonomous, isolated phenomena. [25] In terms of architecture, the scientific laboratory corresponds to the design studio. Such an environment offers the ideal conditions for architectural effects to emerge since it manifests an abstract model of reality and alienates those external parameters which affect and complicate architecture synthesis. The design studios deal with the birth of form solely.

The emergence of a singularity such as an 'effect' does not happen often, as the history of science has demonstrated. As a matter of fact, we can assume the same for architecture. Nonetheless, seen within the context of a series of architectural proposals instead of isolated, the role of a singular project can be settled.

Andrej Radman regarding Le Corbusier's *Four Compositions* writes that it is quite revelatory in terms of what defines a piece of architecture: neither its elements, nor a centre of unification or comprehension, but its invariants when confronted with transformation. As a matter of fact, this can only be achieved by experimentation not *ipso facto*. [26]

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Changing Speed - How 1st Year Students Learn to Learn in the Design Studio

Morgan Flynn | Declan Feeney | Anna Ryan | Jan Frohburg

Abstract

The entry into Irish Universities for second level students is governed by a system of points awarded on the basis of results in a set of state run examinations. In the Irish school system a didactic method evolved in which evident 'truths' are imparted to students by teachers, and at the end of five or six years of second level education the students' ability to restate these truths is measured in written examinations. The School of Architecture University of Limerick (SAUL) uses a completely different pedagogical approach: in the design studio students learn the design process primarily via Socratic techniques with their teachers as well as their peers. Student and teacher engage in an inquisitive dialogue, together interrogating the design problem at hand, with neither knowing precisely what the ultimate product will be, but acquiring the techniques of the process being the ultimate learning outcome. This relies on a specific learning environment and infrastructure (individual and collective workspaces, workshops), and establishing a relationship of trust between teacher with each and every student. This change in learning methods represents a considerable challenge for first year students. Reviewing our approach over the last 10 years, we outline how this drastic shift in learning techniques is negotiated by incoming first-year students, and in particular how the first five weeks of the Design Studio module have been structured to help with this transition. We cross reference our approach as explained in the module descriptors with feedback from a series of interviews with current first-year students, students currently in the upper years of the programme, as well as students who have graduated from the course. We are seeking insights into which techniques are working and which need to be adjusted, and explore if these lessons might have applications beyond a school of architecture.

1. Context

1.1. SAUL - the context (Fig. 1)

SAUL is a young school, the first intake of students was in 2005, with first graduating class in 2010. SAUL was created as the result of a competition between a number of existing third level Irish institutions to provide a new school of architecture in Ireland to address the shortage of architects in the Irish economy. The University of Limerick won that competition, and given that there had been no comparable course in the university previously, this meant that a pedagogical framework could be designed and implemented in a single moment of deliberate creation. In other words, the pedagogy did not emerge over many years, but was conceived in its entirety and then implemented.

Also a remote school, in that at the time of SAUL's establishment the closest school of architecture was 200km away, and a limited number of architectural practices were located in the vicinity of the school. The physical context of the school is a suburban campus, situated in a landscape that strongly identifies as rural, immediately adjacent to a city that has a distinctive urban grid form, which is unique in Ireland, but this form would be not understood or appreciated by the citizens. SAUL therefore came into existence in a context with little obvious pre-existing architectural culture.

This context has had both positive and negative impacts on SAUL and on how architecture is taught and learned in SAUL. SAUL has had the need to make its own architectural context, both in the university and in the city.

It is a small school - approximately 150 undergraduates students across 5 years of study. Students are in the main from the western coastal counties and Munster. A large number grew up in a rural context - 18 out of 23 students in Y1 2018/19 grew up in houses > 100m from the next nearest house. The majority of the students are 18 or 19, and have entered the school via the CAO system, in which a student completes 6 years of secondary school education which culminates in a set of state exams, the results of which determine the course student is entitled to enter.

1.2. The Leaving Certificate

The state exams in Ireland are strongly biased toward a didactic model, with a heavy emphasis on rote learning and the reproduction of prepared answers as part of a written exam. The looming presence of such a high stakes exam shapes the students perception of the teaching and what constitutes effective teaching practices, with both teachers and students driving toward a learning style which focuses on homework and practising exam papers. [1]

2. Transition from secondary school to the design studio

The learning process in the design studio is iterative, evolutionary, encouraging experimentation and revision. The fundamental underpinnings of the pedagogy are captured

in the words of Samuel Beckett, *"Ever tried. Ever failed. No matter. Try again. Fail again. Fail better."* [2]

This is in complete contrast to the process which the students have been using in second level. How a student gets to the answer, or attempts to get to the answer is of little worth, only the answer has value. This has inevitably lead to rote learning, even in subjects which would seem to reward creativity such as creative writing - even in this case however, essays are given to the students to be learnt and then reproduced in the exam. This is in complete contrast to the design studio, the learners conceive of and design buildings as a practicing architect would and teaching is by a practicing professional and the learner engages in the actual practices of the profession with increasing mastery [3].

Y1 design studio must therefore actively respond to this change in approach to learning and many of the key features in the first 5 weeks which are specifically modelled to address this abrupt change.

In essence the first weeks in SAUL have been designed to introduce the idea of space as the medium of architecture, and the process through which this might be explored. The students must learn that there are no preconceived right answers. Design projects are understood not as problems to be solved but as open-ended challenges and opportunities for exploration.

You must search for an answer using many techniques iteration, experiment, responding to student ideas rather than driving them towards a preconceived result.

The process is more important than the product, we shift emphasis away from product querying design decisions, not judging the end product.

Of course, this message evolves as the student progresses and the extraordinarily rich world of architecture is further revealed to them over the full course of the programme. It is also important to acknowledge that the extent of the educational stretch experienced by architecture students in these first weeks is not matched in any other course. A huge component of the first few weeks in SAUL is ensuring that the incoming students become part of the community of learning that is the design studio, both engaging in the social part of etc studio and the realisation that peer to peer learning is an essential part of the experience. There are naturally many formal supports offered by the university for all incoming first years, but there is an explicit recognition by tutors and older years that this is a difficult transition for new students and that they need support. All incoming students experience a "shock to the system" and need to adjust to the independence of campus life and the expectation that students take responsibility for their own learning; and UL is building a university-wide framework to assist and support students in managing this transition. However, in SAUL we are not only concerned with the initiation to a university environment but to a design culture that has its own specific challenge.

It is worth noting at this point that the unusual youth of SAUL has given the faculty insights into the importance of a studio culture, in that the first year in particular had no older peers to observe, emulate, copy or follow. The unique position of this cohort revealed to us how important it is to see a path that others have made before you.

Putting this approach into practice means we have to carefully consider how a number of key inputs are used and the primary expression of this is in the module descriptor.

The products are not described in detail in the descriptor, or to put it more positively, there is an openness which demands engagement from the student. There is a deliberate constant change in the scale they use moving from 1:1 to 1:50 in the first week, and then to 1:10 and back to 1:1 in the second, only to work at 1:1,000 by week 4 or 5. There is a deliberate constant change in the media they use - line drawings, card models, plaster cast models, photography. There is fast introduction of new ideas so the students are stretched from the first day. This means that they start making drawings and models on the first day, and that the initial projects only last a few days before a new project is introduced. There is an emphasis on the idea of space, what that means to an architect, and how it might be described and manipulated. The majority of the students have not studied art in a formal way, and even those who have studied art would not have studied the idea of architectural space. All the projects in the first 5 to 7 weeks look at an abstract idea of space. This is sometimes an analysis of a spatial concept in an existing painting, or the making of space.

Perhaps what illustrates this approach most explicitly are the typical products of the first few weeks in SAUL. Naturally this changes from year to year as different approaches are tested, but there are a few projects that remain fundamental to the module. These include

- 300 x 300 x 300mm cube card model of a space that explores an architectural idea, such as threshold, nested spaces, intersecting planes, followed by a cast model of a space rather than an object.
- An analysis through drawing and model making of a space shown in a painting by the likes of Hopper, Hammershoi, Vermeer.
- One to one space making using timber laths where the students are primed to explore specific ideas such as proportion, section, threshold etc. and the re making of that one to one space at scale in model and in drawings.

In SAUL we recognise that there is a strong emphasis on modes of thinking and developing thinking through making but less on representing that thinking through drawing, models, writings. However: models are a kind of 'making.' And SAUL is working hard to also introduce writing as a mode of thinking. What both approaches share is the emphasis on student engagement, student "doing" (before "knowing") – "only the labouring student can bring forth learning" and feedback works only after action, not after thought – thus shifting the emphasis from 'absorbing information' (knowledge) to 'active testing' (experience). [4]

Of course, underneath all of these Year 1 specific mechanisms is the general framework of learning within SAUL, such as the importance of the space where all students are in a single studio, each with their own desk, generating all the work in the studio. (Fig. 2)

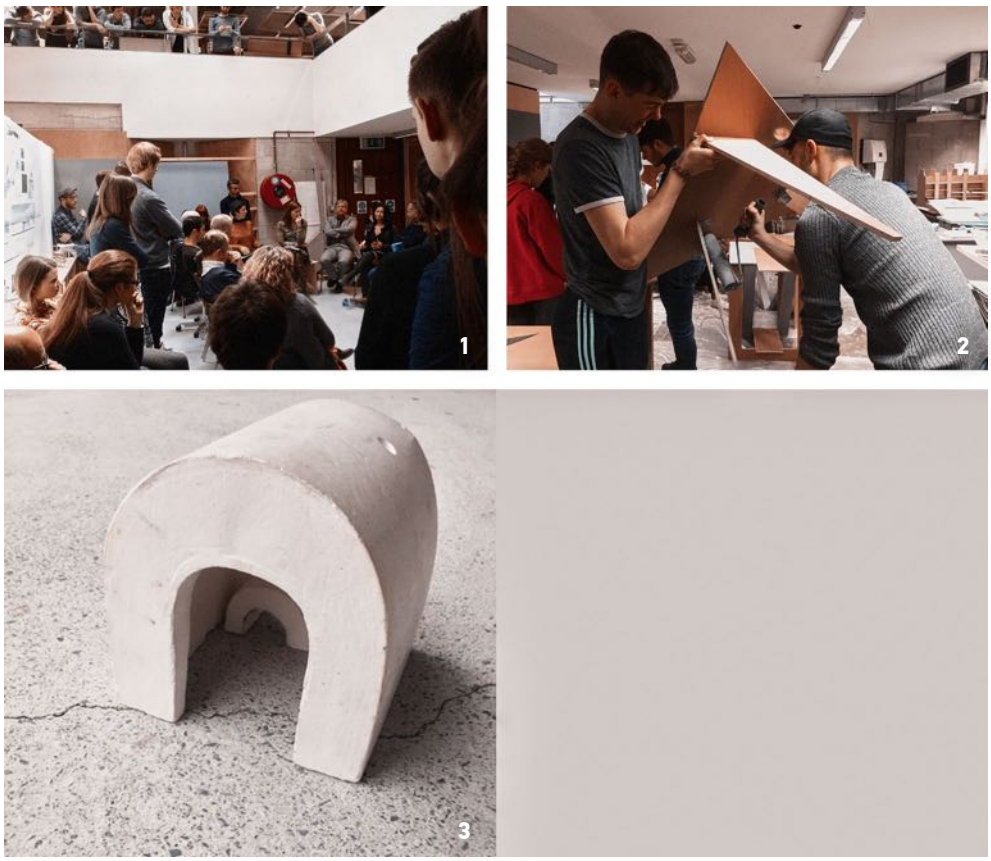

Fig. 2: 1 to 1 making project : First Supper tables

3. Success?

Success in an architectural context is difficult to measure. SAUL graduates are still young and making their way, no Pritzker prizes yet! We do have very high employment rates in our graduates, and slightly perversely we are very pleased to see the wide range of fields into which our graduates have spread - working in architectural practice, founded their own practices, teaching with us in SAUL and other schools of architecture, but also working as set designers and architectural photographers, or training in the European Space Agency. One group of graduates established a think tank that successfully applies architectural thinking to contexts other than architecture - production management, workplace organisation and so on.

SAUL has a (relatively) high progression rate within the university context. 90 to 95 per cent of students in first year continue in second year. However, this is a crude measure, we wanted to get a more nuanced measure of our success or otherwise and as part of this research we issued a survey to our current Year 2, Year 3 and Year 5 students. The total number of students issued with the survey was 80 and we had 40 responses.

The survey comprised of 10 statements with which the respondent could strongly agreed, agree, neither agree nor disagree, disagree and strongly disagree. There was space offered to leave comments and a number of respondents left comments.

The statements were deliberately broad. They explored a core set of issues: the perceived differences between secondary school and studio, what helped in negotiating this transition, the learning culture at SAUL, and the pedagogical approach.

There are a number of key messages from the results of the survey.

The students recognise very clearly (Q1 result) that this is a very different way of learning to what they experienced previously, and that this learning is transformative (Q1 and Q6 results).

Student A said: "*The focus on self learning was a big change.*"

There is strong engagement with peer learning, and one can extrapolate that this corresponds to early/easy admission into the learning community (Q2 and Q3 result)

Student B said: "*Any student that I knew in the older years was glad to help with any questions I had.*"

There is an understanding of the importance of the role of the physical space as a key learning input (Q4 and Q5 result).

Student C said: "*I think being in a studio environment is important to the education but I think having your own space within the studio is the most important thing, somewhere to take your time to think, and not have to worry about anyone else.*"

The most valued modes of learning are the "traditional" modes i.e. one to one desk reviews, small group sessions and crits, in that order (Q7 result).

The majority of students feel that they have adapted to the design studio pedagogical model by the end of the first semester.

The studio is not universally seen as a safe place to fail better. This shows how hard it is to overcome entrenched attitudes and set notions about performance and failure. And it is a challenge for us to work even harder and further encourage students 'to fail'.

Student D said: "*In SAUL I can sometimes feel a fear to make a mistake as the competition for grades is far greater than secondary school. I have a closer bound with the SAUL staff than I did with my school teachers. Therefore I am more inclined to ask a question."*

And Student B said: "*I think it completely depends on the lecturer. Sometimes genuine mistakes are held over you and change lecturers opinions of you and that is hard to shake off."*

4. Implications

The most important finding from our point of view is that there is a number of students who do not perceive the studio as a safe place to make a mistake. The design process is reliant on an ability to experiment, speculate, try different things without being certain what the outcome might be. This means that one has to be willing to make mistakes and that one can make mistakes without fear. This is diametrically opposed to the high stakes exam model of secondary school.

On a more positive side, there appears to be a genuine understanding of the learning framework and the importance of this framework in giving an education that changes how the learner sees the world and operates within it. It appears that the students value the kind of teaching to which the faculty commit most energy. Tutor to student engagement is the most prized input, whether one to one, small group or crit. Despite the cohort being 'digital natives' only a very small number place learning online as the most important input.

We also see the perception that most students adapt the way of learning in the design studio by the end of the first semester as a positive result, particularly combined with the high progression rate which would seem to back this up.

Certainly more research is needed. We wanted to get an overall sense of where our students were in terms of their thinking and how they perceived their learning, and while this has been successful we feel that more detailed exploration with the students would yield fruit.

We in SAUL would hope that our students might begin to understand the insight offered by Neave Brown in a conversation in July 2015

You go through this difficult, disciplined, irregular, unknown, faulty, do-it-again, do-it-again process to arrive at what you end up with. [5]

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