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No Scale, i.e. Full Scale
Introduction / aero-photography

Scale, materiality and closing are three qualities difficult to find in the digital code. The code inserts a rather scale-less approach, conveys an immaterial and intangible perception and remains open at all costs. Understanding these three qualities as an opportunity and at the same time as a limitation, we designed an annual fourth-year design studio course, to deal with them and to propose an intermingling of digital and analogue manners that can be enriching and mould-breaking.

The course deals with the coexistence of a theoretical and a practical approach as well as with the combination of digital and analogue technologies, investigating upon the way that new qualities, or better still, new forms of pre-existing qualities can surface from the coexistence and fusion of digital and analogue concepts. During the course, boundaries, dipoles, and limitations are questioned in order to achieve a holistic, all-inclusive, comprehension of architecture which allows links and interrelations rather than specializations and segmentations.

Concepts¹ / scale-less sketches

Scale is a conceptual tool that is being questioned in the digital age. In the past, scaled representations and models have been used to achieve comprehension and control. In the analogue age, scale has been an important tool for architectural practice, a tool not referring to sizes but rather to the relations among the parts; to the relations among parts and whole; and, finally, to relations with the human body². The automatic interpretation of scale, in hardcopy architectural representations, an outcome of significant experience, made possible the direct reference to the human body. Digital code annuls scale as parts are no longer dependant of the whole and as the code refuses to acknowledge other systems of reference than itself. Digital code questions even the distinction of parts and whole, as all remain interchangeable and open to further manipulation. Passing from one scale to another – a signifying process for the traditional phases of architectural work – has been abolished as the process is now open, continuous, indefinite and endless. There are no more predefined phases as those enunciated by the use of different scales in the past. Scale was not only used as a practical and useful tool but furthermore it was a method that permitted conceptualizing representations and reductions of the project. Reduction is understood not merely as lessening, degradation, diminution but also as simplification, abstraction and idealization³. Even in cases where scale was not used in the context of a linear approach, this was an act of breaking the rule. The digital context entails a different procedure; the file constitutes one entity, from the first line to the final line, making possible for the first sketch to share the same digital space as the detailed final project. These models without scale are models with no front and rear part, that can do anything, rotate, extend, change size and are only momentarily crystallized in interchangeable scales. Consequently, the corporeity of the architect is questioned – as scale existed as a mediator between body and project; the hand knew how to slide through the lines mimicking feet moving about in real space. Digital code refers parts to each other, to the code itself and not to exterior references. Between the architect and the project there is only a mediated relation through the code and this is an ex-
tremely conditioning mediation. In the incorporeal and immaterial dominance of the code, scale, eminently linked to our body has lost its sense.

**Materiality** is another important issue as digital code can be very suitable for representing materiality but in an oblique, peculiar way, as its essence is based in immateriality. The essence of the code is based in immateriality and intangibility and therefore digital representations are quite different than analogue ones where the hand seems omnipresent. There is a certain preference for the eye in the digital code rather than the hand and tactility is not always present. For architecture this is an important issue as final architectural objects are not destined to the eye but to the hand, the touch, or, better still, to the synaesthetic perception of the whole body. The hand, used in the past as an instrument of vision, in order to achieve the completion of the perception of appearances, is also an acting agent: grasps, creates, and sometimes it can be said to think. Even when the hand is present, thanks to evolutionary interfaces, its trace is immaterial, open, scale-less. The eye is now re-educated so as to be able to work like the hand, but in order to do so, the eye has to seek its emancipation from the brain and gain the animalism of the hand. However, architectural representations are used in order to represent an object that doesn’t exist, an object projected thanks to the virtual construction possible by the combination of abstract parts. These representations become far more accurate and exact in the digital era; the computer re-interprets the distance between representations of the architectural object and the actual architectural object. It then becomes possible to have immaterial digital tools that permit the design and approach of architectural projects not through the combination of infinite reductions, abstractions and representations, but rather in a direct and immediate way, as a three-dimensional object that is capable of generating an infinite number of representations of itself. Of course, the digitally designed object can seek its way to production in a simple, immediate and continuous process that questions the gap, created in the past, between design and production. In a strange and contradictory way, the immateriality of the digital code now makes possible a new closeness between architect and architecture. Constructability is immediately linked to computability, opening new opportunities and questions.

**Openness** is another important characteristic brought on by the digital code in the context of architectural design. The indefinite manipulations – the possibility to cut, copy, paste, alter, move, detach, stretch, erase, and finally undo or redo any operation – the lack of limitation to the number of operations – the paper had limits inscribed in its materiality – the elimination of trace of what has been – the palimpsest is now visible only to the code - and the existence of indeterminate phases and transitions are all decisive factors allowing architectural designs to become more and more self-sufficient and at times even, self-indulgent. Architects have, of course, always felt a certain attraction for their media, but digital technologies allow a new type of seduction and furthermore a new kind of comprehension of these model-worlds that appear now at the same time as operational models and as autonomous, self-serving, worlds. In the digital formation of architecture – the architecture that has previously been formulated through means of reductions and models – constructed architecture becomes more and more a surplus and not a *sine qua non*. The openness of the code can, at times, seduce young architects in ways that constructed architecture seems to
fail mainly because of its heaviness, its inertia, its irrevocability and its sense of ending. The architectural object is, by definition, built, finished, closed for the architect and therefore independent and self-sufficient from its creator, it has a life of its own and a death prescribed in its materiality among other factors. Digital representations are always open, never finalized or cut off from the architect’s control, virtual, possible and multiple, a dynamic potential, which remains indefinitely open.

**Design/ 1:500**

The change of paradigm that digital technologies entail is reflected in the ways architecture is taught. This paper deals with the three concepts presented, i.e. scale-less-ness, immateriality and openness in relation to architectural education. The combination of digital tools and analogue practices, allowing a fusion of specific qualities from each technology, in the context of architectural education is a deliberate aim. It seems important to allow and maintain the possibility of combination and of belonging to both systems. Translators – dealing with the re-interpretation of one system to the other – are especially fortunate because they obtain exteriority and thus liberty from the restrictions and stereotypes of each idiom in the perception of the world.

This educational approach is adopted in order to allow focus, at first, on the concept, the abstract reference, and gradually on the process towards the end-product of architecture, the materialised concept - the architectural object.

Currently spanning its third year running, the annual fourth-year design studio course, “le mur est dur”, nowadays WalLab, taught at the School of Architecture, D. U. Thrace, seeks to engage students in a dialogue on architecture through the medium of analogue and digital technology (also acting as tutor during the first year of the course: E. Mandoulidou). Students use digital and analogue tools, exploring their possibilities and limitations. The virtual, scale-less, space of the World Wide Web is the vehicle utilized for exchanging ideas, information, concepts, and designs both inside and outside the studio, extending the “real”, “actual” educational space offered at the school’s facilities, at the same time lifting the common normative preconceptions in the production of architecture – i.e., the linear evolution from larger to smaller scales. The actual construction of a limited number of projects, which become materialized architectural objects, comprises the final phase of the studio.

Special emphasis is put on the function of the student body as a community. During the preliminary phases of the course, students are asked to interact - comment on the projects of each other and the blog is used as an open-ended system that aims to inform and to instigate communication among the group. The blog also forms the platform for communication in the “actual” class. Students bear in mind that during the second semester they will have to operate as parts of large groups, therefore having an honest interest in participating in the projects of others. The big groups formed in the second semester often pose a challenge as they become difficult to manage requiring a certain hierarchy to be established among and by the students. They work in subgroups responsible for specific aspects of the fabrication and they are asked to go far beyond the detailed final design, getting in touch with providers and purchasing materials, dealing with contractors for work they cannot do them-
selves and also communicating to local authorities in order to be able to install their work in public spaces.

Analysing the concept of the studio course and following the evolution of realised projects that culminated from it, the remainder of this paper is structured in three parts; section 4 focuses on the topic, aims and structure of the annual studio course. Section 5 follows the evolution of specific concepts into their realisation, while section 6 draws on the experience gained and discusses the merits of the process.

**Final Design / 1:200 & 1:100**

The “wall” (le mur), one of architecture’s traditional (actual, conceptual, structural) building blocks, is the starting point for students’ concept formulations. Dividing space into opposites of exterior - interior, public - private, open - enclosed, the “wall” signifies the built form’s relation to its surroundings, defining and producing spatial conditions while at the same time being the interface between the user and the surroundings: both filter and boundary. Characterised by the principles firmitas / venustas / utilitas, walls not only reflect the structural, morphological or functional beliefs and capabilities of a society but also convey aspects of the dominant ideologies existent within it. Le mur (the wall), is viewed, in the context of the design studio, in isolation, as a scale-less element to be further defined (- designed) and re-interpreted through a reference to an idea, a vague theoretical concept that acts as a catalyst for the transformation of the wall into a complete and constructed architectural entity, one that still seeks to make reference to the vague and the theoretical, nonetheless through an actual fabricated construction.

The aim of the studio is to offer students a complete experience of architectural design, from concept to realization, focusing on the documentation, critique and rethinking of the evolution of the idea into its built form. The studio seeks to engage students in bibliographic and field research and allow the knowledge gained from the theoretical discourse to be fed into the architectural design process and ultimately allow the latter to culminate into the constructed object. It goes without saying that this process is not linear but rather takes the form of iterative cycles between the three phases. Furthermore, the course aims to capitalise on the possibilities for collective thinking, engaging students in the critique, comparative appraisal, valuation and evaluation of their own and their peer’s projects and ultimately in the selection of concepts that progress to fabrication, allowing students to take ownership of their ideas.

In attaining the aforementioned goals, the annual course is structured in two – autumn and spring – semesters. During the first semester, students are asked to work in groups of two to four persons. Each team of students is then asked to propose for a theoretical concept, a vague idea lying outside the boundaries of the architectural discipline, to be researched. As mentioned previously, the theoretical concept acts as the catalyst for the transformation of the scale-less element of the wall; the outcomes of the theoretical research are required to set specifications for the design of each team’s wall, allowing concept formulation. The remainder of the first semester allows
time for the gradual transformation of concepts into preliminary-design proposals and then into general final designs of walls that still make reference to the original idea that generated them. The students' collective decision on three projects that will be further elaborated on during the second semester completes the first part of the course.

During the spring semester, students are reorganised in three large groups, each of them assigned one of the projects selected at the end of the autumn semester. Each team has to progress the work of the smaller teams, producing a detailed final design – including detailed working drawings and budget estimation. Moreover, teams have to select for a site for the construction of their wall which in cases entails a re-design of the wall for it to fit into a real location. The end-product of this process is the actual construction of the walls – the workforce comprising of the students themselves. However, the course does not end with the construction but asks the students to re-organise into their smaller working groups (of the first semester) in order for them to re-visit their original proposals and comment on them based on the experience gained in the second semester.

Throughout the progression of the course, students are allowed use of any means available to them for designing and testing their designs – drawings, physical or computer models, simulation software, etc. However, in order to facilitate a structured exchange of information between themselves and the tutors, their research and designs are reduced to two-dimensional images in order for them to be communicated through a BlogSpot; the virtual, scale-less, space of the World Wide Web is the vehicle utilized for exchanging ideas, information, concepts, and designs both inside and outside the studio, extending the “real”, “actual” educational space offered at the school’s facilities. This medium allows students to actively make written comments on their peer’s ideas and design proposals, actively engaging them in critique while at the same time constructing a journal of the evolution of each proposal – a diary of the course.

**Details / 1:50 to 1:1**

The actual building of one to three walls, among the design concepts proposed, and selected by the students themselves is the mandatory end-product of the annual studio. Taking place towards the end of the second semester, the construction of the walls reveals the inefficiencies that many times remain dormant in the concept formulation – design phases, which are commonly – in the context of architectural education – mistaken for the end-product of architecture, when, in actual terms they merely consist a conventional temporary phase of the whole process leading to the actual build. Moreover, the requirement for the construction of the walls entails the re-organisation of students from small into large groups that comprise the workforce for the final hands-on experience, allowing them a complete appreciation of their own designs – from the standpoint of the contractor / manufacturer. The two wall concept designs constructed during the academic year 2011-12 are presented in the following sub-sections.
Transform Wall

The concept of transformability is a recurrent theme in the context of the studio. Perceiving walls as rigid boundaries, students often propose the notion of transformability as a catalyst for re-interpreting the wall.

During the previous academic year (2011-12), transformability was researched through a modular construction that comprises of cubes interlinked via hinges, at any case allowing the rotation of each cubic module around an axis that is formed between two attached edges. A restriction in the types of relative movement between modules imposed during design experimentations focused students on exploring the full potential of a single type of joint (pivot) in achieving transformability (Fig. 1,2). The constructed Transform wall ultimately takes the form of a public piece of furniture that can accommodate various formal alternatives; in its deployed state it allows seating and interaction while when contracted it resembles a wall that allows a single opening.

De/-collage wall

The processes of collage and de-collages, consisted the point of departure for design experimentations in the creation of the De/-collage wall. The commonplace practice of gluing advertising posters on any available surface – a process that ultimately has the cumulative effect of various layers of paper glued onto each other and onto the wall – is utilized through the De/-collage wall as the raw material for the formation of instant public collage / de-collages works of art. The constructed wall (Fig. 3,4), suspended between two pillars that mark the edge of a public footpath, comprises of a grid of sliding parts within a rigid boundary; a two-dimensional jigsaw puzzle. Having two sides, the De/-collage wall allows the gluing of posters on one of its sides (the one facing the footpath), which for this reason remains flat, while the other side is marked with colour patterns and protrusions in order to invite users to play with the parts of the jigsaw puzzle, thereby tearing the posters glued on the other side of the wall – thus creating an involuntary de-collages – an instant form of public art.
The course was firstly conceived as a response to the changes that occur in the context of architectural education in Greece. First of all, the term *design studio* seems to be changing as the ratio of teachers to students is radically reduced. The participation of the whole class in the discussion of each project appeared as the only option for allowing a smooth operation on an everyday basis. The implementation of the collective intelligence of the group is proposed as an answer to the lack of teachers and the blog as a tool that served the need for sharing, involvement and cooperation. On the other hand, there are other types of changes that also occur in the education of young architects; digital technologies seem to be radically transforming our relation to architecture. Far from taking a stance in a technophile-technophobe dispute, the course is designed in a way that students can get in touch with tools and practices that combine digital and analogue technologies in a way that seems natural, as architects have always done with tools of different orders. Students are asked to utilise the absolute abstraction of a conceptual reference as a starting point and progressively move on to preliminary design, to general final design, to detailed final design and to the construction of a limited number of projects. From the scale-less reality of the concept-reference they reach the materialization of their project in a specific surrounding with specific providers, contractors and local authorities. The slim tolerances that digital tools and file to fabrication practices would expect, are questioned and renegotiated due to the low-tech construction possibilities offered. On the other hand, digital tools are used to control and check the function of their projects and lack of experience is often counterbalanced by thorough and double checking. Students find the realization of their projects extremely revealing and they are asked to re-evaluate their proposals after the materialization in order to shape and keep track of their changed perception.

Architectural education can only belong to the society that offers it; therefore it can only combine digital and analogue practices and, what is most important, the dissimilar perceptions and assessments that each one brings about. What the authors find most important is that young architects remain free to select and fuse their tools and
furthermore that a solid education is used not for reassurance and certainty but to instigate questioning and doubt.

Notes
9 http://lemurestdur.blogspot.gr/
10 http://lemurestdur11-12.blogspot.gr/
11 http://wallab.blogspot.gr/