

TEACHING INNOVATION IN ARCHITECTURE; FUSING / IN-FUSING / CON-FUSING

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ABSTRACT

The aim of this paper is to discuss the authors' educational approach towards encouraging innovation within the architectural education. This is achieved by presenting the teaching methodology followed within the 3rd Year, 2nd Semester Design Studio at the University of Nicosia, Architecture Department. This specific studio has a concentration on building technology. It aims at stimulating the students' ability to generate creatively new ideas and forms with technology and construction as integral parts of their design process. Required output included advanced detailing and technical requirements including selection of systems and materials, environmental control, energy savings and building envelope.

The structure of the paper will follow a brief introduction of the design studio content and objectives, it will then continue with the description of key drivers that characterized the studio approach and it will conclude with a discussion about the teaching methodologies introduced. Central to this discussion will be the authors' views and experimentations on teaching innovation in Architecture. Can we teach innovation? Can we enforce it? Can we explicitly ask for it? Can we imply the need for innovation and encourage it?

The studio evolved around what the instructors considered as the key overarching drivers towards innovation; Fusing, In-fusing and Con-fusing. These intentions defined the way in which all the ingredients of the studio were introduced to the students, how the discussions evolved and how the individual student's self-reflections matured and disseminated.

The conference paper will concentrate on issues of innovative teaching methodologies and the exponential development of the students' innovative thinking ability.

Critical to the understanding of this paper is the authors' definition of student innovative thinking ability as:

- the ability to think critically and self-reflect
- the ability to recognise pitfalls of conventions as an end to themselves
- the confidence/ambition to dare propose...

Keywords

teaching innovation, innovative design studio, conceptual and theoretical aspects of innovation

THE DESIGN STUDIO ('Let's Cook 24')

"Technology is the answer but what was the question?" (Cedric, P. 1979)

The design studio's objective is to tackle issues of technology as it relates to architecture. 'Technology' is considered on both a theoretical/conceptual level, as well as on an application/performance level. For the authors technology is not approached as simply building technology, but rather as a synergy between the actual 'nuts and bolts' and the experiential/non-physical qualities of architecture. Technology is considered as an inseparable part of the equation of architecture, actually and conceptually. Martin Heidegger offered perhaps the most concise statement about the relationship between poetics and technology. In his essay 'The Question Concerning Technology,' Heidegger argues that *techne* belongs to bringing forth, to *poiesis*; it is something poetic, thereby suggesting the very rootedness of technology in language, and vice versa. (Heidegger, M. 1978)

Investigation and invention were at the core of the design studio. Through investigating and understanding the convention, students were asked to further develop and critically question the appropriateness of relevant issues/solutions. A deep understanding of convention would start a process of modifying, adjusting and developing in order to provide a customized innovative solution to a specific programming. Themes that emerged included the concepts of manufacturability, sustainability, material development, logistics, modularisation, social and cultural relevance amongst others.

In the authors' view this studio exploration can be understood as a 'renaissance'. Douglas Rushkoff states that '...an upscaling of perception, intentions and design is better described as a renaissance' (Rushkoff, D. 2002). Renaissances are, in part, moments when one pulls out of a particular story for long enough to consider the way in which it is being told; the rebirth of old ideas in a new context.

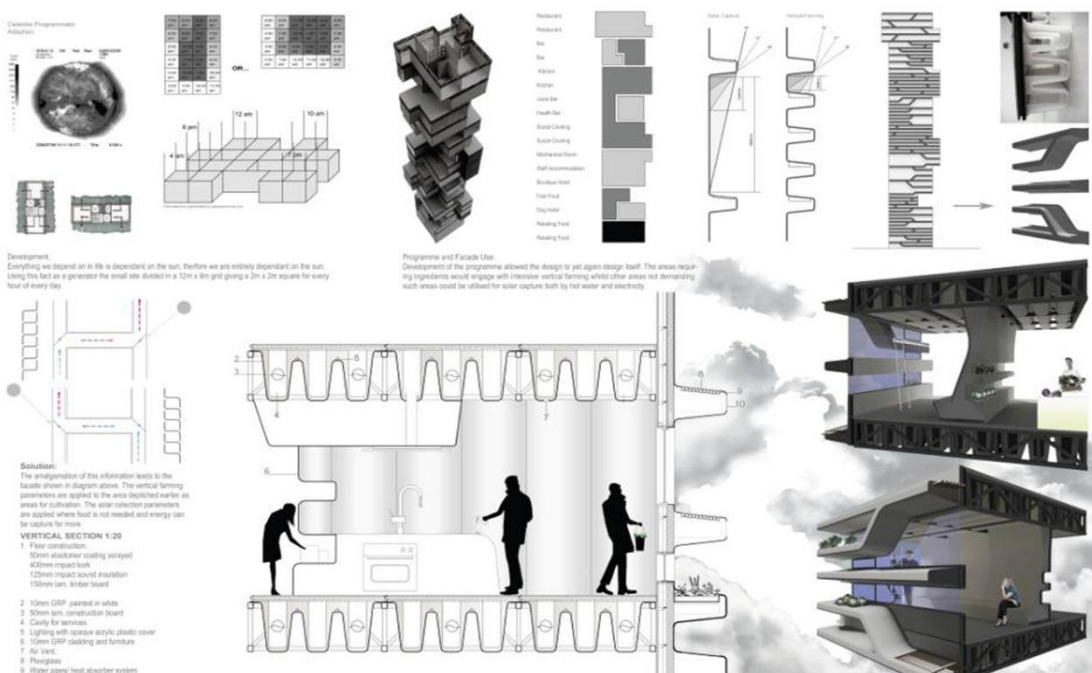


Figure 1: Indicative completed student project

Surreal + expansive brief

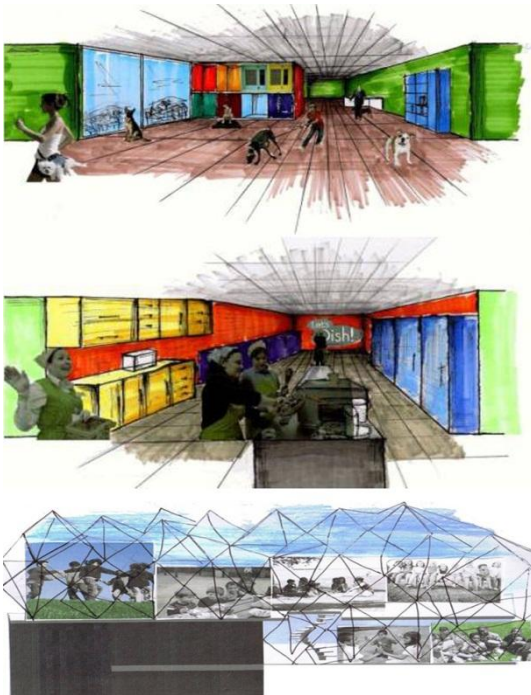


Figure 2: Moments – Social strategies/ users and their environments

The students were bombarded with a surreal and expansive brief. The brief required that a long list of seemingly ‘conflicting’ uses, are brought together in a singular building proposal.

These uses included activities related to the production and consumption of food as well as activities such as community meals, cooking school, stray-animal feeding, consultancies handling, eating disorders (obesity as well as anorexia centre), home cooking (living + working), boutique hotel hosting culinary experts, small-scale growing of food, packaging, recycling and more as appropriate for the development of the brief as a coherent, self-organising entity.

Programme brief elements were categorised in terms of required (approximate) net areas; small (e.g animal feeding space, community meals), medium (e.g organic waste treatment, aromatic herb gardens), large (e.g cooking school, boutique hotel).

The total area of the programme brief was deliberately exceeding the total area requested for the building. This meant that students had to come up with intelligent strategies in order to accommodate all the uses, such as shifting uses or mixing and overlapping uses.

The site as a dissolvable container

The students were given a specific site, a very small vacant lot within the dense urban fabric of the medieval part of the city of Nicosia. The chosen site deliberately posed relevant challenges such as lack of space and accessibility, as well as a necessity to consider the process of onsite assembly for any proposed scheme.

The site was delivered to the students as a given with no requirement for further questioning; traditionally in a design studio involving a historical site one is expected to deal with issues of contextual continuity, preserving the urban fabric and respecting the existing neighbouring uses. Even though there was no conventional site analysis, social/cultural/historical/political issues were laterally introduced by the multitude of simultaneous problems fusing. As the focus of the studio was technology, shifting the attention from urban issues towards the programme defining the strategy resulted in more focused and innovative propositions. Qualities that would be traditionally conceived as universally accepted during a site analysis were in fact down played, thus turning the site into a dissolvable container. As a consequence an active employment of the context is set in motion mostly by finely tuning the proposition and without explicitly responding to the site.

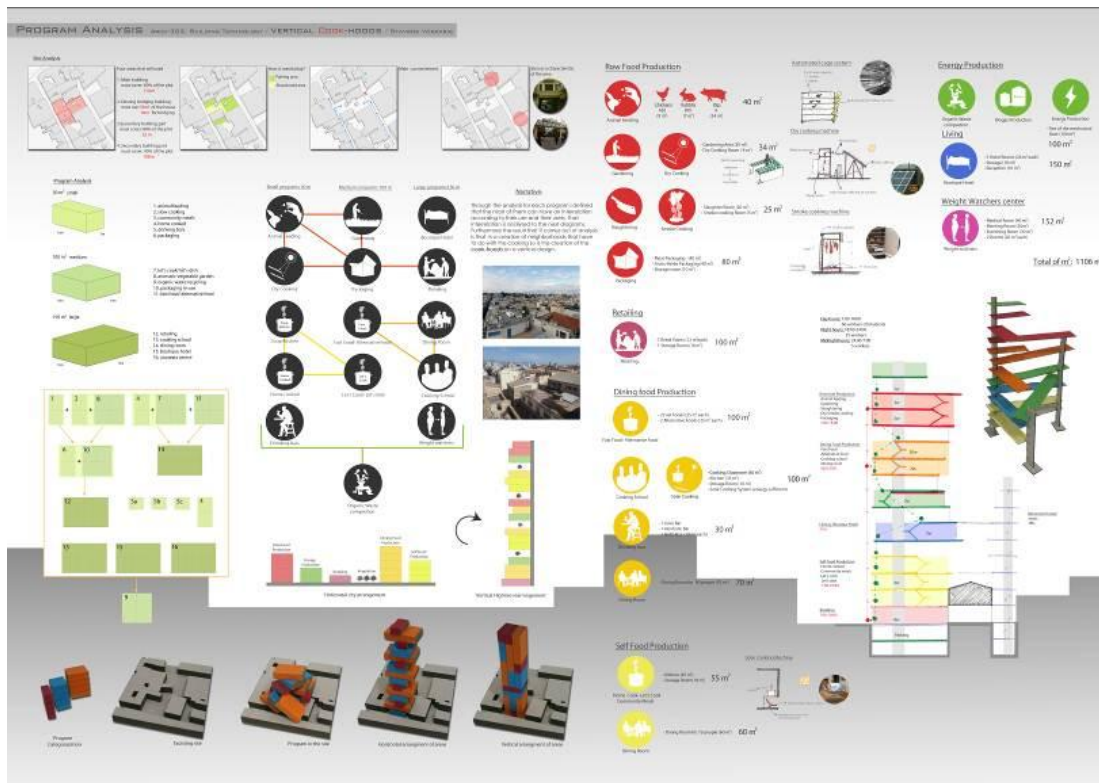


Figure 3: Site/Programme analysis

OVERARCHING DRIVERS TOWARDS INNOVATION - FUSING/ IN-FUSING/ CON-FUSING→INNOVATION

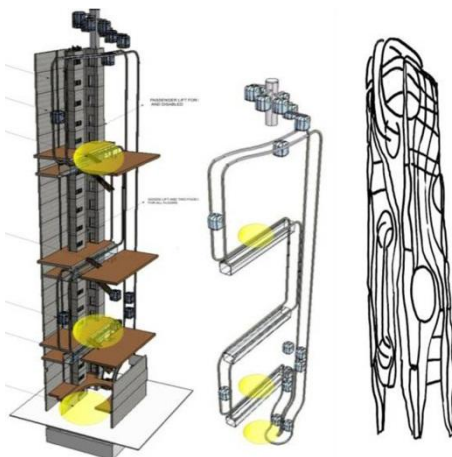


Figure 4: Overall resolutions – devising alternative circulation flows

This overwhelming design studio setup was an instructor orchestrated plan, designed to inflict a ceaseless search of parallel solutions by the students therefore not allowing them to prioritise and fall back on easy solutions. Inflicting seeming confusion upon the students would result in extracting what the authors term as: ‘the students’ innovative thinking ability’. This ability could be further defined as:

- the ability to think critically and self-reflect
- the ability to recognise pitfalls of conventions as an end to themselves
- the confidence/ ambition to dare propose...

The studio evolved around what the instructors considered as the key overarching drivers towards innovation; Fusing, In-fusing and Con-fusing. These intentions defined the way in which all the ingredients of the studio were introduced to the students, how the discussions evolved and how the individual student’s self-reflections matured and disseminated.

More specifically:

Fusing - students produce work and then evaluate; a process that makes them appreciate potential reciprocal fusing of one discovery into another... and another... The intensity of speed and amount of production was critical.

In-fusing – Added ingredients and elements, such as a one-week intense workshop, were abruptly parachuted into the project, thus providing new sets of questions and parallel conditions. The element of surprise acted as a catalyst.

Con-fusing – confusion was enthusiastically encouraged and the only suggested remedy was only more production! Through the way of delivering the brief and the site to the students, confusion was both inevitable and expected. ‘Confusion’ for the instructors meant a positive stage of expansive options and issues for investigation. Instead of following a process of choosing and rejecting solutions, a longer process of distilling the multitude of findings was encouraged.

In line with the above mentioned drivers a number of specific teaching methodologies were put in place.

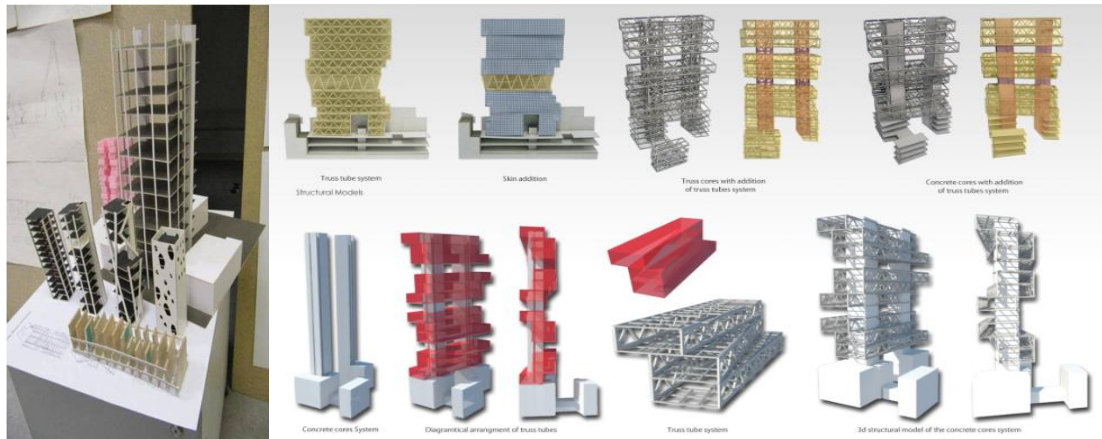


Figure 5: Structural investigations / assessing options

TEACHING METHODOLOGIES

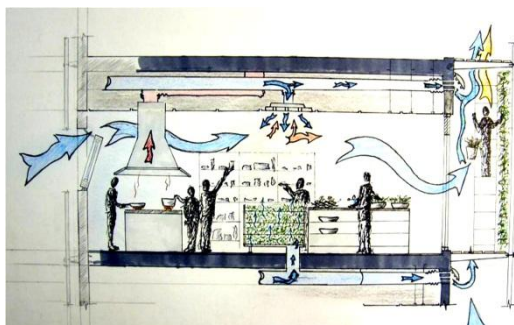


Figure 6: Moments – Integrating the brief with systems at focus points

This studio did not follow the established formula of a design studio; it did not follow a chronological order, there was no time schedule and there were no prescribed exercises and output (Carter, P. 1999).

The given programmatic brief shared similarities with the teaching approach; meaning that the instructors understood the setup of the studio as a list of cooking ingredients, which the title of the studio ‘Let’s Cook 24’ inherently suggests.

A key method was to request from the students ‘cooking’ without giving the ‘recipe’. Instead an exceeding surplus of ingredients and implicit suggestions about ‘cooking’



Figure 7: Overall resolutions / Student driven emphasis on selected output

possibilities was delivered. Such ingredients included the programme brief and the given site in their ‘raw’ state. These ingredients were constantly manipulated in a spiralling process. Students started bifurcating individual ingredients by developing the architectural consequences of particular brief elements in order to compose a programme narrative. They followed by sieving and re-attaching complementary ingredients; for example in order to configure the diagrammatic floor arrangements, programmatic groupings and vertical stacking.

Through intentionally delivering a small and restrictive site and the expansive brief, the instructors were expecting a high rise solution but not stating it. A high rise proposition was an appropriate field of investigation that would prompt skills in complexity competence expected in a 3rd Year studio with a focus on building technology. Therefore the issue of structural investigation according to programme

narratives was added to the so far existing list of ingredients. All other findings were fused with an appropriate structural concept, once again not committing to a singular solution but continuously assessing options.

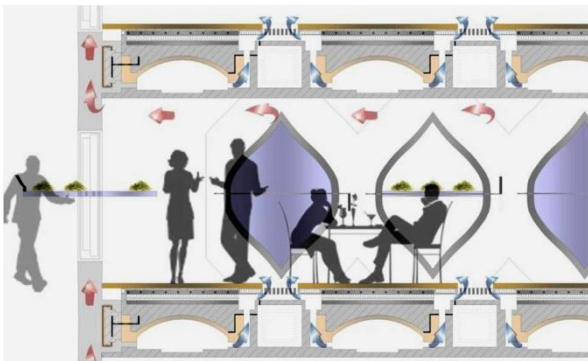


Figure 8: Moments – environmental control systems/façade operations

In parallel to the structural and programmatic configurations students were integrating the brief with systems, such as environmental, building services, transportation etc, at selected focus points. Throughout the semester a continuous shift between zooming-in (moments) and zooming-out (overall) enabled the students to grasp the scale of the proposition and to cross-fertilize findings. Through ‘moment’ investigations the students

also developed social strategies for the user, their environments and the neighboring context.

A second key method was the introduction of a series of in-class workshops on specific themes. These varied from exercises on site logistics, to technical resolutions, to collaging programme narratives, to defining ‘moments’. The common denominator of these workshops was the instructors’ favourite motto ‘Produce!-Produce!-Produce!’. Almost every week in the semester a new workshop was introduced, with a specific output required within a very restrictive time frame. The normal spiralling development process of the studio as a whole continued evolving in parallel to the workshops. The speed and quantity of production was helpful in re-fuelling the spiralling process. The instructors’ aim was to make students aware of the importance of thinking through making and producing, and then evaluating. Over-production would lead to an initial state of confusion but eventually it would lead to informed resolutions.

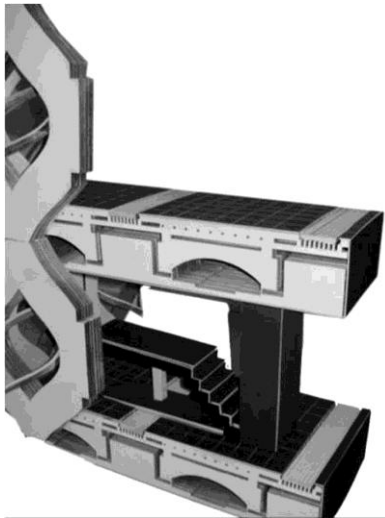


Figure 9: Model study - Integrated exterior and interior modular systems

A third method was to encourage student driven emphasis on selected output. For example a resolution could include a student special interest in alternative transportation systems fused with a selection of other chosen ingredients. This allowed students to define their own path, creating a sense of pride and authority about their work. In addition, at some point early in the semester the target was for students to start generating work for themselves. In line with this, they were encouraged to shift their way of thinking to adapt to new set of parameters. For example a focus shift could adapt to new findings from the in-class workshops.

A fourth method involved turning away from traditional pedagogy and raising horizontal discussion and cross-student fertilization. The traditional role of the studio ‘instructor’ was thus cancelled and replaced with the idea of the ‘facilitator’. At key stages within the semester peer reviews were organized amongst the students.

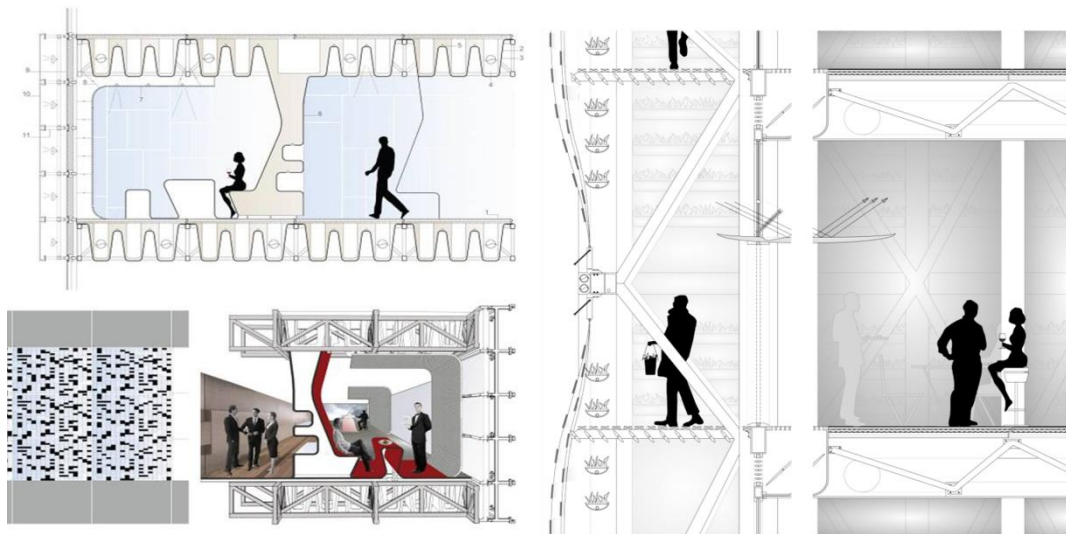


Figure 10: Workshop output- Propositional strategies mature into pragmatic resolutions /Large scale sectional study

The idea of ‘in-fusing’ was implemented through a number of introduced events such as a parallel hands-on construction workshop, and the ‘Let’s Cook 24/7’ intensive workshop. This experimental one-week long workshop took place towards the end of the semester where the student projects were already mature and ‘packaged’ and it brought together students of architecture from Nicosia and Leeds. The visiting team was from the Year 5 Design studio, Sustainability Unit, Leeds School of Architecture. The Nicosia student proposals provided the ‘infrastructure’ for the condensed Nicosia-Leeds workshop. The workshop acted as a ‘parallel’ condition to both the Nicosia and the Leeds projects *infusing* new issues, possibilities and resolutions. The common and individual concerns of the two studios resulted in the development of integrated strategies for sustainable environments through building technology innovations.

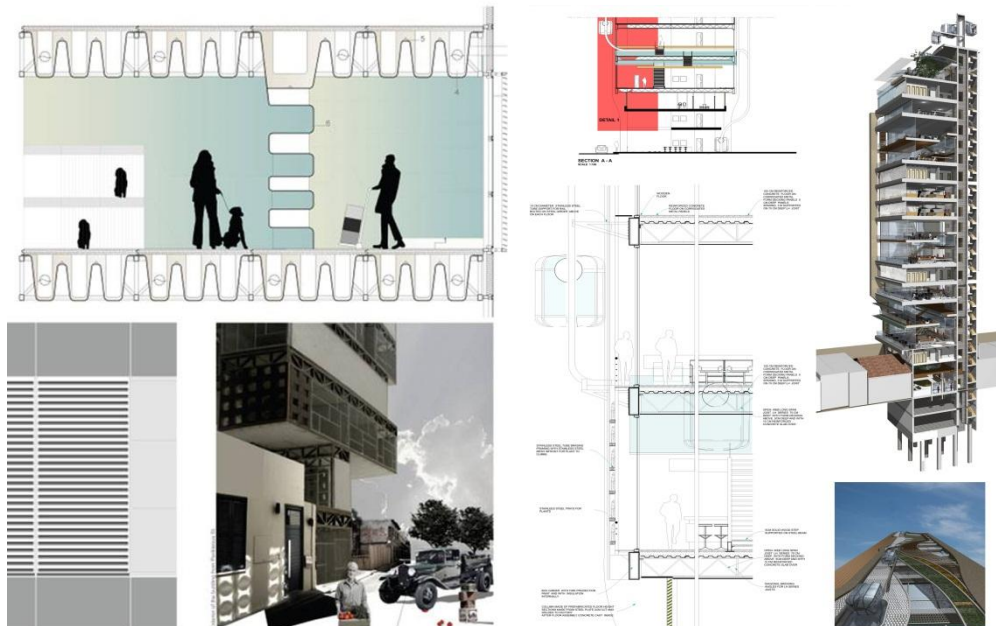


Figure 11: Indicative Detailed resolutions

The specific aim was the production of environmental performance driven facades that respond to climate, temporality and the occupation of the building, with innovative use of technology and materials.

CAN WE TEACH INNOVATION IN ARCHITECTURE?

Central to the experimentations with the aforementioned teaching methodologies were the instructors' concerns about teaching innovation in Architecture. Can we teach innovation? Can we enforce it? Can we explicitly ask for it? Can we imply the need for innovation and encourage it (Lee, L. 2010)?

Overall the need to deal with the various studio themes was not prescribed to the students and especially not labeled. This could have led to preconceived ideas about what the expectations are. Instead this approach inevitably led to innovative solutions. Our educational approach towards developing the students' innovative thinking ability is through posing open ended questions that carry within them inherently the opportunity for rethinking innovatively.

The resultant academic approach therefore is that innovation in architecture cannot be taught, but it can be implicitly encouraged. Innovation in architectural education cannot be easily defined as this could lead to specialized innovative solutions in specific fields; e.g innovative envelope solutions, innovative structural design, innovative materials. Additionally the need for innovation in architecture is often narrowly promoted as an attribute of image and form, especially via the use of digital tools. In our 'digital culture' there is a shift of value to image as opposed to physical presence and usefulness (Baudrillard, J. 2000). Furthermore this shift is reinforced by a so-called setup of competing paradigms (for example the digital paradigm), one cancelling the other, all preaching for the 'new' but not necessarily the 'excellent'. (Jones, W.1998)

Relevant to the above is an understanding of Jean-Luc Godard's *dictum* "Ce n'est pas une image juste, c'est juste une image", where to present just an image would be to solely counter the demand of representation (Dronsfield, J.L. 2009).

In the authors' view, the above mentioned tendencies and preconceptions would limit the students' potential for innovation and they would certainly not work towards cultivating the students' innovative thinking ability. For the instructors innovation is the opportunity to encourage and cultivate an expansive thinking process that could potentially lead to integrative and all-inclusive concepts. Additionally innovation requires a very good knowledge of convention and the courage to critically reinterpret convention and even re-invent it. Inspiration in line with this appreciation can be found in Cedric Price's and Buckminster Fuller's work and Cindy Sherman's artwork.

CONCLUSION

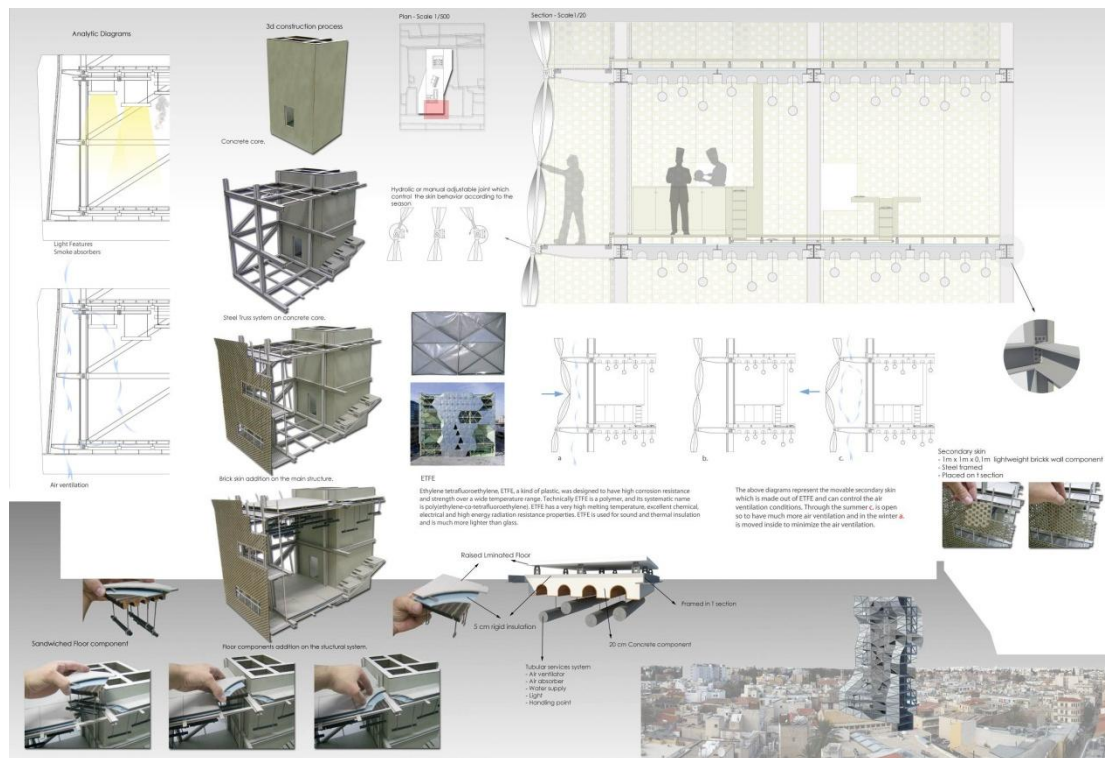


Figure 12: Indicative Detailed resolutions

Reflecting on the student output following the completion of this studio the authors believe that the innovative teaching methods and ideology introduced cultivated the students' innovative thinking ability. Most importantly a "need for innovation" was bred as a bi-product from the students' perspective; they felt that they were opening up a completely new approach to the subject matter and therefore this created a sense of pride and authority.

The need to search for integrative innovative solutions was not prescribed to the students and especially not labelled. This could have led to preconceived ideas about what being innovative should be. When dealing with subjects that have been overexposed in recent academia and the architectural profession in general, such as

the need for innovation, keeping a strategy that raises the issue in an implicit way can be more successful in reinventing supposedly known solutions and applications, as well as generating a more genuine embracing of the subject matter.

Innovation in architecture has to start within the architectural education. The author's educational approach towards encouraging innovation is through posing questions that carry within them inherently a potential for innovative answers.

In the authors' view student innovative thinking ability is triggered by the ability to think critically and self-reflect, the ability to recognise pitfalls of conventions as an end to themselves, and the confidence/ ambition to dare propose...

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