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ABSTRACT

Introduction

Analysis of forms is the course that initiates the essential framework of architectural students in projects discipline at the School of architecture in University of Navarre.

Our teaching aim in this first course of studies in architecture plays a double role: on one hand, to give the students the necessary graphic tools to develop architectural projects and on the other hand, to initiate them in the knowledge of architecture through the analysis of buildings.

Materials and methods

Our weekly schedule consists of a whole workshop day starting with a forty-minute theoretical session which helps the students to immerse into the task they are due to deliver at the end of each session. Structure, construction, light, space, function, form, landscape and environment is analysed by the students along different tasks proposed to them.

In addition to this, a complementary homework is demanded each week to ensure a deeper and continuous process of learning where the students must choose their own motifs and practice different techniques.

Our one-year course also includes four weeks of a monographic theme usually focussed on the analysis of a city area where they explore, in many creative ways, the different scales of the urban space.

Another four-week period is spent on a group exercise of three or four people where they experience working in teams and most of the times how overall results usually exceed expectations.

Each proposed activity enables the students to rethink the architectural project. Redrawing its plans and perspectives allows them to project, interiorize and to have a better understanding of it. The task of redefining the architectural project graphically proportionate them a deeper comprehension of architecture.

The graphic exercise produces a personal encounter between students and great masters of architecture of the twentieth century including their works and thoughts. The design analysis becomes an additional effort to further understand the idea, concepts and constraints that triggered the architectural project.

Results

This double-side way of learning design skills by means of

architectural analysis provides them with the graphic ability to share and communicate their creative thought. It becomes an essential tool in their permanent process of generation of ideas that are triggered by the creative activity now and in their future. These graphic tools allow them to express their architectural concepts and continually adapt their means and intentions to materialize the creative thought made architectural form.

Conclusions

Learning design skills by means of drawing architecture builds their architectural criteria from now onwards and develops their personal mature with increasing analytic contents. Students discover which the fundamental elements of architecture and the links and concepts that combine and articulate them are.

The graphic quality improves notably when they abandon the drawing conception as their main aim in itself and they focus on the architectural object and its analysis.

There is, at the end, a personal fulfilment for the students, not just because of the improvement they achieve over their graphic tools but for their first immersion in architectural thought.

Five key words

Design education through architectural analysis.

ANALYSIS OF FORMS

We would like to share with you our didactic experience in the first-year studies at the School of Architecture at the University of Navarre. Our subject is named Analysis of Forms and it is the course that initiates the essential framework of architectural studies in projects discipline.

In this presentation we would like to introduce you a synthesis of the methodology and the work we develop in our school, as well as our aims and the future developments of the discipline as follows:

1. Introduction:

1.a. Aims / 1.b. Analysis of Forms within the school / 1.c.

Analysis

2. Objectives

1st Design ability/2nd Design language/3rd Design culture/4th Design vocation

3. Methodology

4. End of the process

5. Future developments

6. Results and conclusions

1. Introduction

1.a. Aims

Our teaching aims in this first course play a double role: on one hand, we intend to give the students the necessary graphic tools to develop architectural projects and on the other hand, we initiate them in the knowledge of architecture through the analysis of buildings.

1.b. Analysis of Forms within the school

This subject belongs to the introductory courses in the academic program of the projects department that is divided in six sections and accompanies the students during a five-year long training. Together with “Elements of Composition” from the second year studies, “Analysis of forms” becomes the foundations of the architectural degree before being fully introduced in “Projects I, II, III and IV for the third, fourth and fifth year.

This subject leads our students through a one-year process of intensive learning of graphic skills and architectural projects that will become the foundations of their future professional development, it constitutes their first contact with the architectural process of designing and the starting point of the creative thought.

1.c. Analysis

The architectural project is a creative process that generates something that did not exist before, the analysis starts with the result of that process and from that point intends to show up its ideas and principles, it is meant to be the way of going back to ascertain the circumstances that inspired the project. This analysis is founded on hypothetical reasons however it shows the student how architects operate, design and think their architecture.

In *Mimetics* Aristotle explains how in order to communicate an idea; you need to construct an image, to articulate it. Thus, for him the way of structuring the ideas is to write them. Assimilating the practice of architecture to “writing” in Aristotle, we could say that architects articulate their discourse, their thoughts and concerns through drawing. This is the reason why it is so important to develop their graphic skills in these early stages of their training and to mature as future creators of architectural ideas.

2. Objectives

1st Design ability

The first objective is to provide the pupils with the graphic

ability to communicate their creative thought. In order to learn project and design tools, the following characteristics are essential:

- Agility in sketching during the continuous flux of ideas and perceptions of the reality that architects require as a graphic thought.
- Rigor and accuracy are crucial qualities in a geometric construction associated with the formal dimension of architecture.
- Motion and suggestion in the processes of analysis, representation and production of the intentions of the author.

2nd Design language

The second goal initiates our students into the process of tackling the comprehension and assimilation of a building by means of the graphic language. The reconstruction of the architectural project by means of the analytic drawing reveals the complexity of the elements, relationships and laws that composes it.

They redraw the building in order to reprocess it and to rethink the fundamental elements, laws, relations and concepts that materialize the design process.

3rd Design culture

The third aim proportionates them a basic architectural culture. Analysis of forms produces an encounter with the masters of the modern and contemporary architecture and at the same time introduces the students into the cultural dimension and the architectural panorama which is going to be the environment where they are going to develop their professional vocation.

The graphic analysis implies a further attachment of the individuals to the architect and the project that they conceptualize rather than the segmented method of the theoretical and historical point of view separated from the learning of graphic tools.

We propose relevant works of twentieth century masters to prompt in our students an enthusiasm for research that will be incorporated in their cultural baggage to be used in the future as precedents or references for their own career.

4th Design vocation

Finally, one of our goals during this first year is to make them relish the design tools that will accompany them in their future because it is in this enjoyment when the process of learning

becomes really efficient and the vocational side of our profession plays a crucial role. Unconsciously, their attitude taken in every graphic task is captured in the final result and their psychological mode is proportional to the expressiveness of their work.

It is an important target for us to be able to transmit them the enthusiasm for the architectural project so they can get engaged with it and at the same time, they learn how to appreciate the architectural work in their first contact.

3. Methodology

The weekly schedule consists of a whole workshop day starting with a forty-minute theoretical session which helps the students to get immersed into the task they are due to deliver at the end of each session.

Part 1

At the beginning of the process, during the first three months it is necessary to provide them with basic drawing tools such as perspective rules and techniques like watercolour, ink, charcoal, pencil...etc.

The course is divided into two parts. The first one, as it has been said before is focussed on learning almost purely drawing tools, so they can make use of them during the second part. Nowadays, it is been proved the low level that architecture students start with in drawing skills, so it is been essential to initiate the program of Analysis of Forms with this part based on natural perspective drawing.

The second part of the program is more plan or architectural drawings based and it is structured as follows.

Part 2

The analysis of each project is aimed at partial studies selected for each work related to the master architects of the twentieth century and its aspirations that are considered by the students through different tasks proposed to them.

Partial studies:

1. Structure and construction are the material dimensions of architecture providing the architectural project with stability criteria and support.

2. Light is the mechanism that architects control by means of the section devices, skylights, mechanisms and holes of regulation.

3. Space is understood as generation and relation

established by the building. Moreover, it embraces the concepts of scale and the geometric dimension.

4. Function as the adequacy of the uses in architecture.

5. Form concerning composition, plans and volumes.

6. Landscape and environment as determinants of architecture and how buildings respond to them.

In each theoretical session of the analytical part, early in the morning, we try to introduce a concept in architecture through history and contemporary works, we also aim at give them an overall idea about the architect's career and influences and finally we provide them with relevant information about the project they are proposed to analyse for the rest of the day.

Individual research plays a crucial role in their training so we encourage them to use the library to get a deeper understanding of the architectural concepts, periods, precedents, influences and styles. This research routine tends to be very useful for future courses and professional career, to be in continuous contact with the library and to build up an individual research which feeds up every architectural creation.

The methodology to study the building proposed under the partial studies recommended to them is made up by three stages:

1. To compile information about the project deepening in the research of the building, the author and the circumstances that conditioned it. They discover the elements, relations and the intentions of the project. In these initial phases it is important to combine different techniques of drawings and to travel across the space by sketching quickly the first stages of the analysis.

2. To define conclusions and fundamental ideas or concepts under the specific aspect that has been researched.

3. To manifest and communicate the conclusions by means of a summary sheet applying their graphic resources and their ability to suggest.

This one-year course also includes four weeks of a monographic theme, at the beginning of the part of analysis, usually focussed on the analysis of a city area where they explore, in many creative ways, the different scales of the urban space.

Another four-week period is spent on a group exercise of three or four people, at the end of this part, where they experience working in teams and most of the times how common results usually exceed

expectations. The buildings they study are chosen according to a theoretical based proposal such as Second Generation Architects, Spanish architects of the fifties, dwelling projects...etc, so they can frame their works within the history and theory of architecture. As they must do public presentations, they learn how to express and defend their conclusions and their objectives in public discussions while presenting them to their colleagues.

In addition to this, a complementary homework is demanded each week to ensure a deeper and continuous process of learning where the students must choose their own motifs and practice different techniques. The students become very fond of their ability to draw and to represent the reality under their own criteria.

Each proposed activity enables the students to rethink the architectural project. Redrawing its plans and perspectives allows them to interiorize and to have a better understanding of it. The task of redefining a building project graphically proportionate them a deeper comprehension of architecture.

The graphic exercise produces a personal encounter between students and great masters of architecture of the twentieth century including their works and thoughts. The design analysis becomes an additional effort to further understand the idea, concepts and constraints that triggered the architectural project.

One year program sample could be:

Part 1: Drawing techniques

Week 1: Presentation. Natural perspective.

Week 2: Intuitive approach to conic perspective system.

Motif: composition of boxes at the workshop place.

Week 3: Line drawing. Motif: indoor spaces at the school.

Week 4: Line drawing of a more complex building.

Week 5: Light and shadow studied in boxes.

Week 6: Light and shadow. Motif: a building in the campus or in the city.

Week 7: New techniques, they create their own sculpture with umbrellas or hats and experiment with watercolour, ink, wax, charcoal, pencil, acrylic paint...

Week 8: Figure drawing. Motif: themselves.

Transition part

Week 9: Guest artist. (ie: reproduction of figures of the Sistine chapel, to study the composition of the bodies,

proportions...in a big format)

Week 10: Guest artist. (ie: the students create their own sculptures with tires and stools driven by the Guest artist)

Week 11: Complete representation of a complex building. They choose their own techniques.

Week 12: Trip drawing. ie: They analyse the old part of the city with quick and expressive hand sketches.

Part 2: Analysis part

Exams period: thematic motif, they analyse an area of the city form different scales during four weeks.

Week 13: Representation of architecture from its plans. An architect is invited to our session, explains them a project and they analyse it graphically during the day.

Week 14: Architectural concepts- Structure: Farnsworth House, Architect: Mies Van der Rohe.

Week 15: Architectural concepts- Function: Unité d'habitation Marseille, Architect: Le Corbusier.

Week 16: Architectural concepts- Light: Riola Church, Architect: Alvar Aalto.

Week 17: Architectural concepts- Function: Exeter Library, Architect: Louis Kahn.

Week 18: Architectural concepts- Global analysis: Guggenheim Museum New York, Architect: Frank Lloyd Wright.

Week 20: Group exercise. Presentation and research.

Projects

Prefectural government office Kagawa, Kenzo Tange

Rodovre Town Hall, Arne Jacobsen

TWA Airport, Eero Saarinen

Sydney Opera House, Jorn Utzon

Ford Foundation, Roche and Dinkeloo

Week 21: Group exercise. Public tutorial

Week 22: Group exercise. Public tutorial

Week 23: Group exercise. Deadline and public exposition.

Week 24: Analysis of a building in a natural environment.

Week 25: Analysis of an architectural project in its urban surroundings.

Week 26: Exam.

4. End of the process

In order to evaluate the results of our students we give them a weekly mark together with some individual feedback which is

explained in groups of 15 people and some comments to improve their graphic skills. These marks are not numerical because we want to stress out the importance of the evolution rather than punctual results. In the process of learning design tools, as it happens with languages, what matters is that at the end of the process the pupils must be able to express the architectural concepts through their drawings, they need to be mature enough to continue the following courses with the appropriate skills.

This unfolding or positive progression in acquiring graphic instruments is much more evident during the first year because they realize themselves when comparing their first drawings with the last works of the course in a sort of sense of pride and self-confidence.

This evolution is so important for us that we revise individually each student's complete work half-way and at the end of the process to encourage them not just in each punctual deadline but in a broader sense, looking at all their works along the course at the same time.

To encourage them and to reward their efforts we select several drawings each week to stand out publicly. We use the school's web page to publish the outstanding drawings or we pin them up at the workshop for a week. As a result, it produces a dynamic learning process because the rest of the students can also find a source of inspiration in their colleague's sketches.

During the group exercise we organize public tutorials where they are asked to express themselves in public and to defend their aims and results. Thus, another aim is to create a pedagogic environment where they share their experiences and also develop their skills in a working group so important for their future in the architectural profession.

5. Future developments

Nowadays, a key point during the design train process is the introduction of computer modelling and digital techniques.

There is a current debate in architectural schools about questioning the uses of traditional drawing, what is the kind of drawing that architects and society look for today?, Is it possible to conceive design without traditional drawing?

Our bet consists of providing our students with knowledge to define graphically and geometrically their projects before they get in touch with digital systems. Thus, on the solid base of their

formation they count with a weapon to be able to control the digital process in the future so their creative ability is not absorbed by the means, in this case, the computers. It is being experienced in the introduction of digital tools that the lack of ability in applying them can block the architectural production and design.

We believe in traditional means especially in the first and individual stages of the design procedures however we would like to stress the idea that these initial phases can be complemented with the input coming from digital techniques.

Our proposal tends to introduce digital tools in a secondary phase, once they have built up their criteria in their creativity. We believe in the positive feedback that the new technologies provide in design tools and how they are transforming our profession with digital representation.

It seems clear to us that computers are breathtakingly transforming the architectural environment however our profession also demonstrates us through history that architecture makes use of technology and at the same time looks back to its traditions. As Le Corbusier stated: "*on monte sur les épaules*" which means: We stand on the tradition's shoulders.

The mastering of computer programs is deeply related to the knowledge of traditional means such as material definition, perspective rules, scale, space...architectural paradigms. We can not deny the specificity, the data and accuracy of computers, nevertheless, they need the human mind to coordinate and govern the digital processes.

As a conclusion to this section on new technology we would like to remark the compatibility between digital and traditional techniques and the potential advantages for design training in the future but they should be complimented with the maturity that tradition offers to architecture.

6. Results and conclusions

This double-side way of learning design skills by means of architectural analysis provides them with the graphic ability to share and communicate their creative thought. It becomes an essential tool in their permanent process of generation of ideas that are triggered by the creative activity now and in their future.

These graphic tools allow them to express their architectural concepts and continually adapt their means and intentions to materialize the creative thought made architectural form.

They articulate their design process through the act of drawing which becomes their language from now on. Continuing with the parallel between drawing and language, it is demonstrated that the best methodology to learn a language it is to practice it, so we encourage them to learn graphic tools by drawing and practising them.

This journey in the first year of architectural studies is hard and sometimes can imply some moments of discouragement but it is finally and highly rewarded with the satisfaction that provides the self-control and command of the graphic skill. This is the reason why we intend to play down the relevance of the punctual marks stressing the point that mastery in Analysis of forms is acquired during the last phases of the course and the ideal slogan that as students we are unable to admit: “the main goal are not the marks but the knowledge we achieve” and that learning of design tools is a matter of time which means mature and overall hard work.

Learning design skills by means of drawing architecture builds their individual criteria from now onwards and develops their self-mature with increasingly analytic contents.

Students discover the fundamental elements of architecture and the links and concepts that combine and articulate them.

The graphic quality improves notably when they abandon the drawing conception as their main aim in itself and they focus on the architectural object and its analysis.

There is, at the end, a personal fulfilment for the students, not just because of the improvement they achieve over their graphic tools but for their first immersion in architectural thought.

For us, as tutors, it is always a reward to see how their efforts and perseverance are translated in impressive improvements along their paths and how comparing drawings from the first month to the last works, at the end of the course, shows our students potential, enthusiasm and energy in their future careers.