

## Teaching Architecture An Approach through Construction

### The implementation of a methodology

In a period where architectural education becomes continuously more theoretical and construction methods more complex and specialised, the question that arises is how and with what means construction knowledge can be conveyed to the students of architecture. This brief paper presents the approach of the School of Architecture of the National Technical University of Athens on the subject, in three distinctive periods of time i.e. the past, the present and the future, as our interpretation on the subject has evolved over the years due to several unforeseen difficulties.

Before describing the exercises and alterations that took place over the years, it would be necessary to present the basic ideas that transpired the problem and the aims that were cast for the success of the experiment.

Acknowledging the problem, the late Dimitris Biris, Professor, colleague of ours in the School, more than ten years ago, took the initiative to introduce an elective subject, in the eighth semester, where the students would design a relatively simple project, following their inspiration on a set theme. The prerequisites for the success of the class were, the direct relation between the inspiration, the design and the eventual construction of the ideas by the students themselves. One of the limitations of the class was the small number of student participation.

The first aim of the exercise, was the perception, the feeling of the materials, their transformation and behaviour, without any calculation. To achieve this aim it needed detailed '*explanation*'.

The second aim was the way the above mentioned would be conveyed, bearing in mind the lack of experience and observation skills of the students. Thus the problem of the teaching method and consequently of the '*transmission*' of knowledge and experience.

The third aim was to what extent the students would exploit the exercise and would absorb and assimilate the experience, to be utilised productively in their future projects, thus the problem of '*memorising*' the knowledge.

Finally the fourth aim was the relation of the drawn design to its actual construction, which should also include the application and the experimental use by the students themselves, to assess the extent of the success of their design. Thus the problem of constructional skills and '*acting*' through the exercise was raised.

In *teaching Architecture* in our department, we are trying to elaborate a methodology through which the students will effectively acknowledge the relation between their ideas and the process of implementing them in forms, volumes and finally buildings that serve a particular purpose.

To make this more effective, the late D.Biris a fellow professor and dear friend, had the idea of starting an exercise in which the students could understand the relation between the design as a project and the actual built product. In other words, how much the design was influenced by the process of the actual construction of the architectural concept.

To achieve that, the exercise had to be simple, well-organized with a strict time schedule and a small group of students.

Therefore the exercise, under the title of *Architectural Constructions*, was established as an elective class aiming at a small number of students since the number of tutors was limited.

The first four weeks, out of ten, were dedicated to the development of the ideas, the next four to the designing of the final idea and the analysis of its construction. In the last two, the first one was dedicated to the organization of the whole project and the second one to the actual construction.

A normal semester has a duration of twelve to thirteen weeks. Nevertheless in this particular exercise, the actual implementation took place in a whole week at the end of the semester.

The students worked in groups of six to eight persons and the participating tutors were four. Each one of them was responsible for three groups, approximately eighty students in total. The exercise was offered in the eighth semester, of our school's five-year curriculum.

The materials for the construction were calculated and kindly offered by sponsors, since the school's budget was and is very tight.

The first experimental implementation of the exercise was an absolute and total success, even though the problems were not limited and the involvement of the teaching staff, much more than expected. The students were delighted by the idea that their project was to be constructed and their excitement and dedication during the construction phase, went beyond words.

The construction week, was a sort of fiesta in the atrium of the neoclassical building of our school, with the rest of the students participating as viewers or asking for a little action, which cost the teaching staff with a lot of anxiety, fortunately, with no casualties.

Since the exercise continued in the following years, a small budget was established from the school in order not to depend entirely on the various sponsors.

The projects, over the next years, were of a variety of subjects, all of them aiming at the same objective: *the experience on the transition from the design process to the accomplishment of the architectural idea.*

## The Methodology

## The Constraints and the Success

## The Projects and the Aims

The first project was the design and construction of a small platform as a part of a larger setting in a theatrical play. The platform had to be raised from the stage and an actor should climb up by means of a stair or ramp to perform his part. The materials that could be used were timber, metal or a combination of both.

When it was decided to ask the students to build a floating contraption capable of carrying one person for a certain distance, we knew that it would be more fun than a serious project. At the end we had quite a few ingenious designs that actually floated, were self propelled and did not sink after their first launch in the pool we built inside the school's atrium.

The construction of equipment for a children's playground, created additional interest since all of them finally were donated to a borough east of Athens. The constructions had to be capable of carrying loads and extremely well finished, since so many small hands were to come in direct contact with the equipment.

The construction of a timber beam bridging a certain span capable of carrying a weight of 100 kilograms in its centre, involved in the design the collaboration of a structural engineer, who assisted the students to understand to what extent a design can be affected by structural constraints.

The building of small bridges, apart from the obvious aim to achieve a comprehensive design that could be constructed, at the same time offered the opportunity to test the limits of the elements used, by loading them to the breaking point.

The building of a small platform at the beach, from which one could simply watch the sea, brought the whole class to a specific part of the eastern Peloponnese, outside the protective walls of the school and in contact with the local people. The construction was done in the patio of the local secondary school and the platforms were left, as a gift, to be used by the people who went to the beach for sunbathing and swimming.

### **The Evolution of an Idea**

The success of the project, combined with the modification of the school curriculum, led to the inclusion of the subject as one of the compulsory classes. Thus it was introduced in the sixth semester, as one of two selections, i.e. between 'Architectural Construction' and 'Industrial Design'. This change created two distinctive problems, which were, the increase of the participating students and the relative immaturity of the younger age.

Nevertheless under the new conditions, one project was executed, the design and construction of a lifting mechanism from the first floor of the atrium of the school, capable of bearing a weight of fifty kilograms. The exercise was realised with great difficulties, due to the number of students, the limited available space and the younger age, which produced a headache to the supervising staff, for safety reasons.

The problems that arose in the past were enhanced to the extreme due to the overwhelming increase in the number of students, which resulted in the reconsideration of the operation of the class. The above plus the unfortunate passing away of our colleague Dimitris Biris, who motivated and inspired us, lead to the reconsideration of the way the subject was applied. Thus it was chosen to require the design and the production of a model in 1:10 or 1:20 scale. This is the way the subject is examined presently, with different results in relation to the original idea.

The design of a fire observation tower in the forest is a typical example of the latest project. The students have to deal with a construction that can be erected with minimum available means, by a team using low technology tools. Therefore they have to plan a sequence of events in order to get the platform built.

The acknowledgement of the importance and the desirability of the exercises to return to the previous framework, with the fact that the number of the students is gradually decreasing and the added actuality of the newly organised construction workshop, it is planned to reinstate the subject as an elective in the eighth or ninth semester in order to work with more mature students. The accumulated experience and the undoubted belief on the necessity of construction as a part of the teaching methodology, is motivating our efforts.

## **The Present**

## **The Future**

# ARCHITECTURAL CONSTRUCTIONS



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To make this more effective, a fellow professor and dear friend the late D. Biris, had the idea of starting an exercise in which the students could understand the relation between the design as a project and the actual built product, in other words, how much the design was influenced by the process of actually constructing the Architectural concept.

To achieve that the exercise had to be simple, well organized with a strict time schedule and a small group of students.

The projects, through the years, covered a variety of subjects, all of them aiming on the same objective: *to experience the transition from the design process to the accomplishment of the Architectural idea.*

The exercise, by the name of *Architectural constructions*, is established as an elective class and the number of students controlled and kept low in order to achieve an optimum result.



