

Treatises and *Ars construendi*: Teaching's Method Theory and Practice of Critical History's Application Based on Teacher-Student Relationships

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Abstract

The topic of this lecture is the results' description obtained during many years of teaching. We shall illustrate how students use the same analytical techniques to study two different aspects: 1) Architectural Treatises are first studied separately and then in a comparative way. The purpose of this graphic analysis is to reach a new interpretation of them through the realization of original graphics; 2) The Roman *Ars construendi*: architectural techniques and buildings' typologies used by the Romans are investigated in the archaeological sites, where the reading of buildings' stratification in different historical periods becomes an important teaching tool.

Keywords

Teacher-Student Relationships, Critical Thinking, Pedagogy, Architecture's History, Classroom Management

1. Introduction

The following research is derived from the experience of university education in recent years in the Architecture's History: this testifies to an experimental teaching effort, the classroom management strategies, the course of study and the relationships that develop between teacher and student through the analysis of the architectural treatises and technical literature, together with direct investigations *in situ* of the aspects about the execution of the work, the building materials and construction processes.

In this way, the students are taken to analyse the same theme in two separate and parallel paths, through an interdisciplinary approach between design, history and the

continuing search for development of critical thinking [1] in student himself [2]:

1) The study of the architectural treatises; 2) The Roman *Ars costruendi* analysis; 3) The research works developed by the students as a group.

1. The Treaties on ancient architecture are individually examined and compared with each other by highlighting the similarities and differences; the aim is a new interpretation, through the creation of architectural models and processed original graphic patterns, aimed at the analysis of the building materials and construction techniques specific. This method of analysis will understand what happens when you draw freehand diagram for example of a planimetry: it is firstly noted on the monument the significant elements that characterize the work, so you have to synthesize what has been observed through drawing.
2. The architectural techniques and construction methods used in the Roman period are analyzed directly in the archaeological sites, where even reading and the design of the building stratification of different eras become a tool for student training. The exercise of drawing requires a work's observation more focused and profound: through it they can understand the proportional relationships and to detect aspects that normal vision is not able to ensure.
3. Working as a group, students develop and mature the critical thinking skills, autonomy in the historical and scientific research, and so strengthen the relationships between them and the teacher.

Recent years' experience seems to further confirm the clear benefit of this teaching tool for classroom management, also for the purpose of arousing latent vocations for possible disciplinary insights.

This paper, therefore, wants to be a testimony of the experience gained over the last few years of teaching the Architecture's History in the Faculty of Architecture (Pescara-Italy).

This experience has developed over the past years teaching History of Architectural Techniques and is currently in the Degree Course of Building's Techniques, single teaching of Architecture's History.

It is believed to be important to stimulate student's interest for the ancient buildings, thus achieving a sense of awareness and maturity that can be shared with other subjects and disciplines.

In addition to lessons, teaching is to encourage the opportunities for direct contact with architecture, through monographic communications, seminars, visits to historic sites, field exercises.

2. Methodology

Through this methodological experience Architecture's History study by theoretical becomes application.

The educational objectives are conditioned by the level of students' prior knowledge and the purpose of their different curricula.

They are considered to be essential objectives:

1. Knowledge of Architecture's History, compared not only to built works, but also to the many relationships that have allowed the diffusion of various architectural styles in different geographical and cultural contexts.
2. Another key goal, though, is the historical knowledge of the evolution of the methods and their components (**Figure 1**).

Among the conceptual objectives of a general nature, you want to get the student to understand the close relationship in every period of history between the architecture and the methods of construction; this awareness increases the student's critical thinking skills, his analytical thinking and deductive about the construction process and operation of the studied buildings.

The student is then guided to an analysis, we can say synchronic and diachronic, of some basic elements of architecture through its historical formation.

From the synchronic point of view, student must understand the different solutions developed in each geographical area, designed in the same historical period, analyzing the possible similarities and differences.

From the diachronic point of view, however, student must understand the consistent aspects in the historical evolution that has taken place in the same place.

The teaching of the theory, it can be more successful when the teacher and the student work closely, as this facilitates the study and learning, because there is a direct experiences' communication.

The theoretical exposure helps the understanding of the students, stimulating their interest in the topic.

In the next step, in reference to the application of what was learned by the student in the theoretical stage, we will seek to consolidate the knowledge acquired through some practical experience.

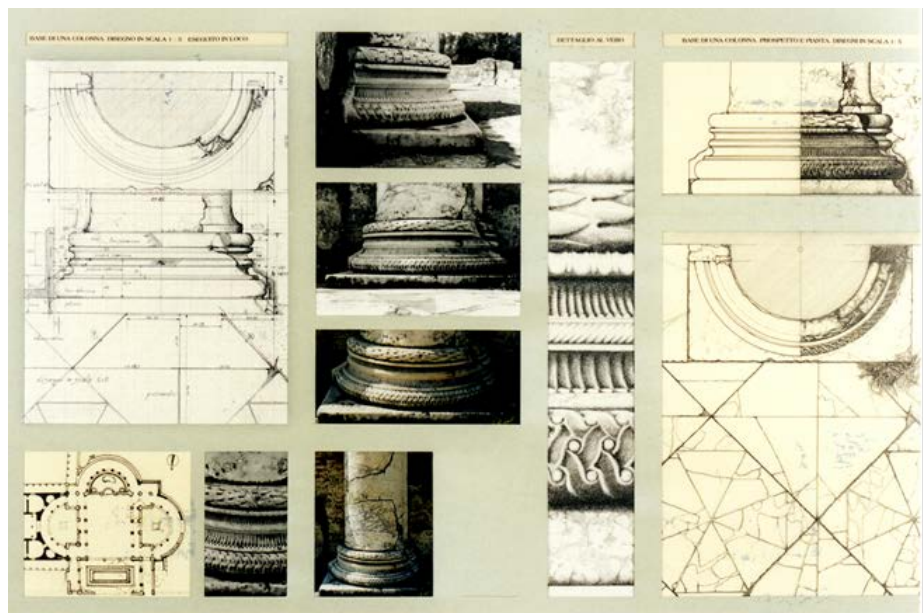


Figure 1. Column bases study.

3. Development

In this meeting “Which history for what story?” exposes a didactic example, developed a few years ago, which is the analysis of the architectural treatises and technical literature, conducted along with direct surveys of the works *in situ*, during which they are also covered aspects related to the execution of the work, the building materials and construction processes.

In order that the goal is really achieved, it is necessary that the student acquires a personal capacity to understand the architecture (Figure 2).

The Treaties on ancient architecture are examined individually and then also compared with each other, highlighting similarities and differences; the purpose is a personal interpretation by the student of these texts, through the creation of original graphic models, with particular attention to the analysis of its constructive components and their graphic representation, through the building materials and the technical constructive specifications.

Later, the architectural techniques and building types are analyzed directly on buildings.

In the proposed specific example, these studies are carried out in the archaeological sites from the Roman era, in which even the reading of building’s stratification in different eras become a tool for student training.

In addition to knowledge of basic discipline’s terminology, the bibliographic research and along with major operations, this training course provides a critical interpretation, refers to the specific knowledge on periods, social conditions, spatial context conditions, and in particular on the works, languages and types.

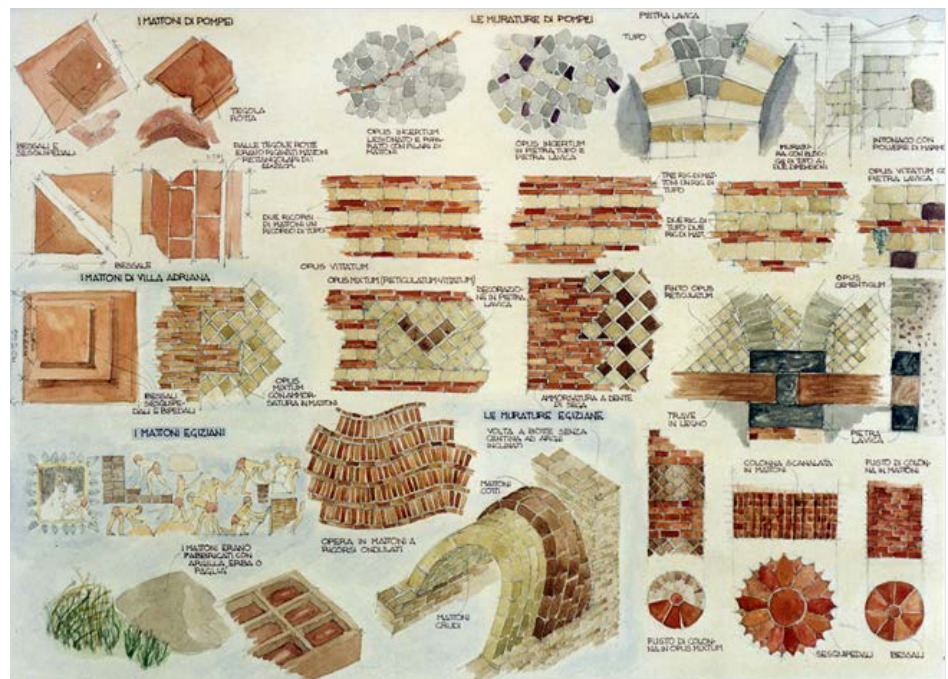


Figure 2. Construction techniques table.

The course includes some exercises in groups, allowing the student to mature its work understanding, formulating also individual judgments with historical-critical foundation.

The study starts from reading of treaties' text and it's realized in a series of graphics, through which the theoretical aspect is interpreted in a personal way (Figure 3).

This graphic step is consulting other texts, from which are also borrowed the analytical mode.

The student, for example, compares it with the trainer with the reading of the architectural orders as are described in the treatise object of study.

Other aspects investigated are the methods of design described by the ancient authors, as well as the types relating to the buildings' plans, through a synthesis and graphical interpretation process.

In addition to Vitruvius' text [3], we analyze the successive treaties [4], regarding the studied issues, relating to mortars and various materials [5] already used in Roman times [6] [7].

You can, as well, check the differences between the text of the authors considered and among the Vitruvian text.

This interpretation is always confronted with the reality of the inspected works directly during the study trips that are a significant complement of academic pursuits.

The most interesting and conclusive phase of treatises' theoretical study consists of a comparison between the various texts studied, conducted regarding specific topics, in order to have a systematic view of how these aspects are considered by the authors.

The next phase is the buildings' direct analysis, through which the student is led to see what he had deduced from treatises' theoretical study.

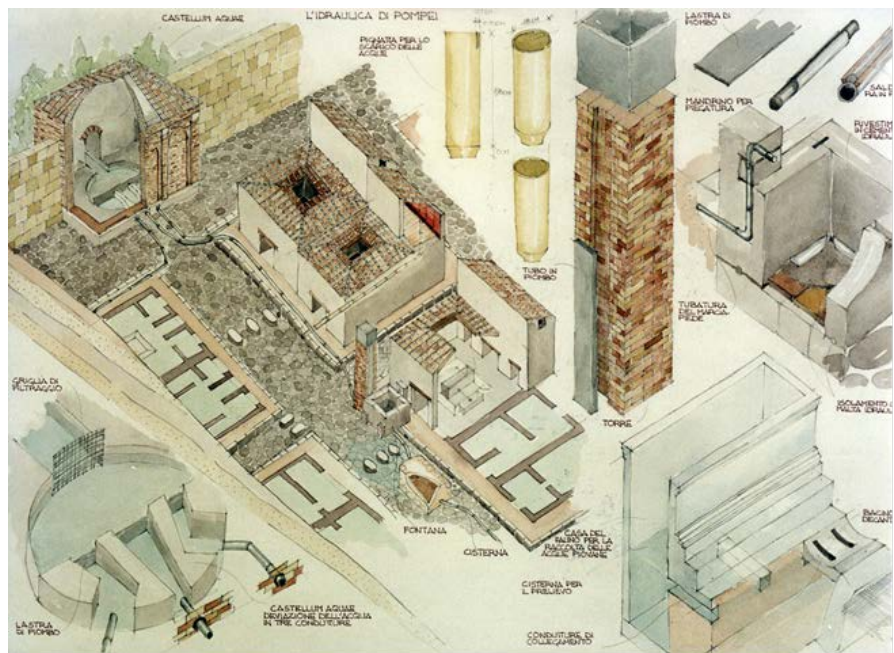


Figure 3. The Roman architecture sketch.

4. Conclusions

To explain succinctly, it shows how this field of study is placed in an interdisciplinary context and also aims at achieving transferable experiences in other fields related to historical artifact.

In summary, the student must be able to recognize the architectural forms through their history and design, but also the structural systems that give rise to these stylistic forms, identifying the components and their parts.

Study the different types of construction means knowing how to identify and recognize their morphology, their functions and their behaviors.

This way of approaching the study Architecture's History allows to know the techniques and their historical development in theoretical and practical way, along with the materials and their implementation in the construction process.

And thanks to this classroom management approach, the bond between teacher and student is amplified and becomes deeper because the work is always done in close contact between the two figures; it follows a development of student creative thinking as well as a problems' high resolution¹ [9] capacity and an increasingly accurate classroom management methodology by the teacher view under the aspect of critical pedagogy [10]-[13].

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¹As K. Popper argued, scientific research is to solve problems [...], and then learn to solve problems is learning to live.

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