
LEARNING ARCHITECTURAL RESTORATION THROUGH COOPERATIVE WORKING STRATEGIES

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TEACHING ARCHITECTURAL RESTORATION

Introduction

The specific theoretical, technical and multidisciplinary nature of the teaching of Architectural Restoration is such that it quite often gets broken up into different areas of knowledge, and the student ends up missing out on the vital complex overall vision of the process of restoration.

Various authors, professors of restoration and heads of International institutions have highlighted this problem.

Sharon Cather, writing in a Getty Conservation Institute publication, describes her views on the situation:

“This situation is an artifact of the ad hoc development of conservation, in which subject matter is expertise dominated, and it is partly due to the fact that conservation is not a discipline but, rather a hybrid –or hydra- that we rightly call multidisciplinary. Because it is multidisciplinary it does not slot neatly into the classical structure of higher education, and it is still far too small –in all senses- to form a new discipline. It therefore loses out.” (Cather 2000)

Approaching from the same reading of the problem, and with a clear intention of addressing it, restoration architect and Honorary President of the ITC¹ de ICOMOS Jukka Jokilehto argues for the need to find methods that develop the critical capacity of the restoration specialist above and beyond technical capabilities. (Jokilehto 2007)

On the other hand, in the European context in general and the Spanish context in particular (Mileto 2011), the recent and progressive adaptations of the programs for European higher education have led to new skills related to conservation and intervention in architectural heritage being included in the subjects taught from the beginning of the degree course.

In this context, which will be developed later in greater detail, somewhere between the over-specialization and the constant instability of educational programs, tools must be found to improve the capacity for analysis, reflection and especially for synthesis and overall vision in the interventions of architects in historic buildings.

The aim of this paper is to present some of the conclusions from an educational research project looking to improve these capacities by using cooperative working strategies.

The European context

In the context of our investigation, and in order to understand the parameters that have brought us to the current situation, it was necessary first to understand how the teaching of architectural restoration has evolved in Europe.

This evolution was explained very succinctly by Jukka Jokilehto in his article *An International Perspective to conservation Education*.² In it he undertook a journey through the history of conservation education. Starting in the nineteenth Century in France, England, Germany and Italy where students were taught to imitate the great theorists of the era by the distinct schools of architecture and archaeology. In the case of France the attitude towards restoration and teaching emanated from Viollet-le-Duc, the aim of which was to “ascertain exactly the age and character of each part – to form a kind of specification of trustworthy records, either by written description or by graphical representation” (Viollet-le-Duc, VIII:22f). This aim according to Jokilehto forms the basis of French restoration education, much criticized for trying to bring about a “correction” of history.

The situation in England at the time was characterized by the influence of John Ruskin, William Morris and the subsequent founding of the SPAB.³ Between 1903 and 1911 this organization published

its first guidelines, and the *Repair of Ancient Building*⁴ (Powys 1929) with the aim of providing techniques for interventions in historic buildings. According to Jokilhto the SPAB was subsequently dedicated to the training of architects by means of advising directly on site, giving instructions on the practicalities of repair work and maintenance in historic buildings.

In Germany's case, Jokilhto quotes the meetings organized by the conservationists *Tage für Denkmalpflege*.⁵ In these meetings the question of how conservationists ought to be trained was debated. At a theoretical level, these discussions were divided between followers of Viollet-le-Duc and Ruskin. Although Austrian, and not studied by Jokilhto, this investigation has also taken into account the art historian from the early 20th century Alois Riegl, and his booklet *Der moderne Denkmalkultus, sein Wesen, seine Entstehung*.⁶ The consequences of this publication cannot be linked in a direct way to education in the field of restoration, but his theory of values forms a part of many conservation education programs.

In Italy, according to Jokilhto, the figure of Giovannoni stands out as having been Chair of the *Estudio y Restauro de los Monumentos* in the School of Architecture of Rome in the 1920s. His influence later opened the way for specialist schools that were set up in Milan and Naples. He also played an important role in the drafting of the Charter of Venice in 1960 alongside Roberto Pane, and for his part in the founding of international institutions like ICOMOS and ICCROM.⁷

At this point in time the need to design educational programs can be clearly read in the restoration charters and in the proceedings of the conventions of the different organizations. This focus was as much about raising the awareness of society as the specialization of the different professionals involved.

From the 1970s this preoccupation with education in conservation and restoration spread and multiplied exponentially at an international level, accentuating even more the relationship between the approach to restoration of each society and their manner of teaching restoration. Jokilhto quotes Prof. Paul Philippot, education director of ICCROM, in order to draw attention to this situation. According to Philippot, the rise of awareness regarding the protection of heritage involves the recognition of characteristic cultural values of each society. For this reason, attitudes towards restoration become fragmented and the educational strategies as well. A consequence of this process is the increase of new specialist areas and learning opportunities.

In order to get to the heart of the matter in relation to our investigation, we started from this historical overview first so as to determine the current situation at both European and Spanish levels.

Regarding the European situation, there are two institutions which have active working groups reflecting on the education of conservation architects. The first is the scientific committee of ICOMOS specialized in education, the CIT.⁸ This subgroup, created in 1993 meets regularly with the aim of keeping its *Guidelines for Educa-*

*tion and Training in the Conservation of Monuments, Ensembles and Sites*⁹ up to date. This document lists the necessary skills that professionals involved in restoration ought to possess in terms of different studies undertaken.

For architects, two abilities stand out which are considered highly relevant for this investigation:

1. To make balanced judgments based on shared ethical principles, and accept responsibility for the long-term welfare of cultural heritage.
2. To work in multi-disciplinary groups using sound methods.” (COTAC 1992)

This document, together with a critical reading of history, reinforces the need to analyse the teaching of restoration in Europe in a detailed way. The analysis should take into account those educational criteria that help future conservation architects to acquire the capacity to think critically and to lead multi-disciplinary teams.

For this reason it was fundamental to find the other organization that has a working group studying how best to teach restoration: the conservation sub-network of the EHNSA¹⁰ itself a subgroup of the EAAE.¹¹

This association of European architecture schools published the proceedings of three of the workshops organized through its specialized conservation group: those of 2002, 2007 and 2009. It amounts to a total of 108 papers from 18 European countries, with 8.75% of all the schools of architecture in Europe represented.¹²

Clearly the proportion of schools present at conferences does not represent the sum total of teaching of the discipline, so the conclusions cannot be taken as definitive, but the analysis serves as a starting point for the investigation carried out.

Some conclusions regarding the teaching of Architectural Restoration in Europe can be drawn from a critical reading and analysis of the proceedings of these three meetings, especially with regard to three specific aspects:

1. The relationship between the teacher's professional method or philosophy of restoration and how it is taught in the schools. This parameter helps to highlight how the historical tendency towards teaching students the current professional attitude in every society continues today.
2. The multidisciplinary nature of conservation. It is important to know if students are educated in order to work with teams of experts from other disciplines with the aim of detecting whether the problem of over-specialization is addressed in the education process.
3. The subject of restoration design understood as an exercise in synthesis. The aim of the analysis is to find out how far the critical capacity of the students is developed.

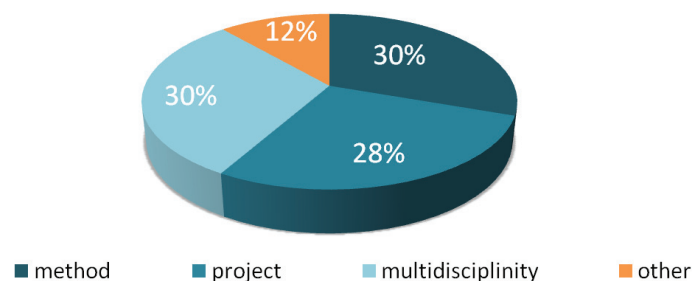


Figure 1. Proportion of the parameters studied out of all the papers. (Mariona Genís-Vinyals)

The principal conclusions of this analysis are the following:

Although the proportion of parameters discussed indicates a balance between the three themes highlighted, the main conclusion of the analysis is that there is a clear subordination of the design and the multidisciplinary to the method, which is without doubt the parameter with more contributions of greater interest.

In practically all of the papers, one method of teaching restoration or restoration design is explained and defended in such a way involving the explicit or implicit application of the method at a professional level or to a lesser extent at an experimental level in a research context.

However, the Italian situation ought to be examined in greater detail, since in two specific cases the teaching method is linked to just one way of doing restoration.

This fact, as well as confirming the polarization between these two attitudes to restoration, suggests that maintaining their link with the methods taught is a way of perpetuating them.

This reading comes on the one hand from the papers of Marco Dezzi-Bardeschi and Carolina di Biase of the *Scuola di Specializzazione in Beni Architettonici e del Paesaggio di Milan* in which the former proposes as a method the separation into two parts of the process of intervention in a historic building: firstly the student learns conservation (it is not considered to be design so much as applied techniques) and afterwards the student learns how to design, where that is understood to mean a contemporary design process.

The other side of this polarization is represented by Michele Zampilli of the *Università degli studi Roma Tre*, who employs a method which has as a guiding principle that architectural heritage ought to be restored and conserved by architects capable of expressing themselves in the language of historical construction, instead of by architects who want to express their own language.

The rest of the papers, broadly speaking, fit into a general view, which is based on the need to apply a method which offers the stu-

dent the capacity to choose in a critical way the criteria, processes and aims of each case.

The methods proposed are different, and two of them are studied in greater detail due to their effect on the critical capacity of the student:

F. Doglioni of the *Università IUAV di Venezia* proposes the sequence of study and analysis “character-necessity-expectation”, in which at first the building is studied, later the current state of the building is described and finally a brief or possible use is proposed.

J. Coenen of the TU in Delft instead proposes the study of the building in a progressive way over different steps:

1. Modification
2. Intervention
3. Transformation.

From reading these papers it can be concluded that regarding the state of European conservation education in the 21st century, it remains linked to both theory and practical reality which, quoting Maria Piera Sette, can be summed up with the expression “the contemporary tri-polarity”(Sette 2001).

The same three poles are evident at a professional level and in education: the *hyper-conservation* of Marco Dezzi Bardeschi from Milan, the *cultured recreation* of Paolo Marconi of Rome (represented in education by Michele Zampilli) and finally perhaps the most popular, the *critical restoration*. This movement which had its origins in the evolution of the Charter of Venice, was brought up to date by the objective restoration¹³ of Antoni González. It is methodical, free from the prejudices of the other two schools and centered in architecture. The examples given by Doglioni or Coenen could be identified with this last movement.

The Spanish Context

The analysis of the history of the teaching of restoration in Spain, despite not having the range of attitudes and theories of European restoration, is essential in order to understand the characteristics of the proposed investigation.

José Luis González Moreno-Navarro analyzed in 2009 the history of education in this discipline in Spain from the second half of the 20th century up to the recent entry to the European higher education environment.¹⁴ In his paper he discusses the curriculum from 1957, the year in which the specialization in restoration was implemented in the School of Architecture in Madrid only. In 1968 this specialization disappeared and was not brought back into the curriculum until 1994, and it appears in a very irregular and unstable way in the latest syllabus.

This reading of the situation is interesting because although not many generations of architects were able to receive a specific education in

Spain, there does exist a critical mass of conservation architects, both theoretical and practical, who are internationally recognized. According to González Moreno-Navarro, this is due to professional initiatives, often led by university professors, which organized courses and professional education programs that are still ongoing.

On a methodological level, based on this analysis there is no link between professional practice and architectural restoration education, but it is worth pointing out a second important reading: that of the professional profile of the Spanish architect.

Although as González Moreno-Navarro and Casals explain in their article "Las estrategias docentes de la construcción arquitectónica" (J. L. González Moreno-Navarro and Casals Balagué 2001), the fragmentation of knowledge is present and deeply rooted in Spanish architectural education, even with this fragmentation the Spanish profile differs from the European for having managed to maintain the notion, not just creatively but also technically, of architectural design (Casals Balagué 2004).

This capacity to perceive architecture from a technical viewpoint is fundamental for the proposed investigation.

HOW TO TEACH ARCHITECTURAL RESTORATION

The combination of the readings of both contexts brings us to the search for a verifiable teaching method which would, when implemented, immediately start to improve the student's capacity for analysis, reflection and synthesis. The specific characteristics of the Spanish architect, as discussed above, must be taken into account in the development of this method.

Active methods to improve the critical capacity

Active methods have formed part of the evolution of teaching throughout the 20th century. They are based on a type of teaching that incorporates the interests of the student and influences his moral character (Dewey 1938). The aim is for a more aware type of learning in which the student is not a passive agent, but participates and involves himself in the running of the course, in order to obtain the necessary knowledge or information aims of the course.

The theoretical basis of active methods is provided by Piaget's theory (Piaget 1969) explaining how knowledge is formed and the psychological significance of many of the methods practiced in schools.

Some of these methods have moved on to more complex ones such as cooperative learning, problem based learning or the case method.

Manuals based on recent investigations were read in the context of this investigation, like the book *Sistemas comparados de educación superior en Europa. Marcos conceptuales, resultados empíricos y perspectivas* (Teichler 2009), which shows the peculiarity of each one of these methods by applying them to the Spanish university sys-

tem within the European higher education context. These texts led us to the selection of cooperative working for our proposed pilot study.

The key to this method of achieving the objectives according to Panitz (Theodore Panitz y Patricia Panitz 1998) lies in the exchange of information between students, who are motivated both to learn themselves and to improve the level achieved by others.

In the context of postgraduate education, various references were found to show the advantages of this active learning method in order to work with very specific material that requires a high level of critical or creative knowledge, based on Bloom's¹⁵ taxonomy.

One example of a postgraduate training program in a profession somewhat removed from the restoration of architectural heritage, but which has similar multidisciplinary characteristics, is highlighted by Matsuo (Matsuo 2003) in his training program for medical residents. The cooperative methodology was useful in that the doctors training for their specialization found a systematic way to obtain and rationalize the information provided by laboratories and tests. Meetings held with the cooperative working tool called jigsaw,¹⁶ were used to meet this need and above all to reinforce the need for group work at certain levels of specific knowledge.

This part of the investigation shows the suitability of the use of cooperative working in the context of classes to achieve one of the specific objectives of the investigation: the improvement of the student's capacity to work in multidisciplinary groups.

The Application of Cooperative Work Strategies in the Restoration Design course

The educational improvement proposed is intended to influence the entire process of specialization of conservation architects and for this reason the student is taught to design using a method, which itself is used at a professional level by the teachers José Luis González Moreno-Navarro, Albert Casals and Mariona Genís.

The objective-systemic method has as a general tool for understanding and working the systemic approach of Mario Bunge (Bunge 2002). This method is also firmly based on the theory of values of Alois Riegl (Riegl 1902) which have been adapted to the 21st century and the Mediterranean cultural environment; and finally his design methodologies are based on the "Critical Restoration" and "Objective Restoration" of Antoni González (González Moreno-Navarro 1999).

It is characterized by the following steps:

- *Knowledge*: the aim is to identify the monument and ascertain its potential use.
- *Reflection*: the aim is to determine the hierarchy of the values, the balance between proposals and resources and present and select alternatives.

□ *Intervention*: the aim is to intervene in the building taking into account in a critical way during the different phases (design and construction) the knowledge and reflection acquired.

The use of this method in the design classes for the Masters Degree in Technology from the UPC allows us to compare the results obtained by pupils at different points in the development of the restoration project.

The investigation project proposes the piloting of this cooperative working project using the methodology described, in six pilot schemes involving students from three different academic years.

At this time two of the six schemes have been finalized within two compulsory subjects in the specialization of Restoration and Rehabilitation of the Masters Degree in Technology from the ETSAB (UPC). These subjects are *Introduction to Architectural Heritage* and *Restoration Design*.

In both subjects the students work in groups of four and are allocated a specialist role at the beginning of the course in either architecture, historical construction, history or restoration. The information relating to their specialization is available to them throughout the entire process.

This strategy is intended to be repeated in a sequential way. Firstly the strategy is used in the subject entitled *Introduction to Architectural Heritage* which is taught with the aim of making a critical analysis of a building already restored; and later the strategy is used again in the subject *Restoration Design*, with the difference that in the second case the amount of time is extended to allow the group of students to work on the restoration projects.

This is a sought after repetition in order to create an influence beyond the teaching objective towards the training of an attitude.

Both subjects are developed in the context of a case study.

In the first subject, *Introduction to Architectural Heritage*, the students are arranged in groups of four, and each group becomes a Heritage commission which needs to evaluate a built project: the restoration of Castillo del Paborde in Selva del Camp. This simulation is accompanied by a submission of a report which also simulates reality. We will call this the base group.

The simulation has twin aims:

1. To bring the students closer to actual professional activities related to their specialization.
2. To act as a structure for the jigsaw activity.

Jigsaw is the cooperative working tool in this process. It is a further level of realism applied to the case study, but in this case under the guidance of the teacher.



Figure 2. Part of a Heritage commission report undertaken by the students in the *Introduction to Architectural Heritage* subject (Students: Albert Montillia, Andrea Salaberrí, Elena Macho y Fani Martín)

Each one of the groups becomes multidisciplinary as described before, which means that it also fits the reality of a heritage commission. Each member of the Group is given a specialization and the expertise that goes with it. Every base group has each type of specialization.

The exercise is carried out using the jigsaw process, while the case study is the framework in which it happens.

The teacher provides the material to the students, giving them a reasonable amount of time to read and understand the case. The session dedicated exclusively to the cooperative work starts in the first class after reading the material. It is carried out in the following sequence:

Initial meeting between specialists. The aim is to resolve any doubts and to achieve a greater degree of knowledge, but also to improve the student's abilities as specialists in preparation for subsequent work in the base group.

Subsequent meeting in the base group to characterize the building. This will involve making an initial assessment and evaluating it, in order to be able to write a critical report about the action taken. Each specialist has to bring the knowledge that they acquired

through reading the material and through participation in the meeting of experts. This is the moment that all of the participants are committed to the exercise. They also have the added responsibility that the global vision of the group depends on their explanation.

From this point on there is a virtual space made available for every group of specialists, so that the in-depth discussion about the evaluation of the building remains open.

Finally, in the last session the evaluations carried out by every heritage commission group and base group are pooled together.

With regard to the subject *restoration design*

The concept of the case study is the same as the students were using in the previous year during the course entitled Introduction to Architectural Heritage.

This time the context in which the simulation is developed is a submission based on a real competition in a monument of national interest like the *Pabellón de San Manuel del Hospital de Sant Pau* (Barcelona, Spain) or the *Tempio Duomo de Pozzuoli* (Naples, Italy) in which they make up a multidisciplinary team much like the real thing.

The process of the case study and jigsaw is the same as described in the previous course.

The difference is in the aim. In this case we are not judging a restoration Project carried out by someone else, but rather we have to apply the information from the preliminary studies to making decisions.

In this case the jigsaw process doesn't just affect the reflection process (as in the previous case) but instead it aims to influence the relationship between this process and the intervention.

The goal of this new jigsaw is make a public presentation of at least two different designs to a jury that, like in real life, is also made up of specialists from other disciplines.

OBTAINING THE FIRST RESULTS AND CONCLUSIONS

The analysis of the results is being carried out by comparing the evidence gained from the sample group and groups 1 and 2.

The type of evidence that has been gathered and that continues to be gathered is the following:

1. Surveys of a wide range of the sample Group, emphasizing the aspects and abilities which will have an effect on groups 1 and 2.
2. Surveys of groups 1 and 2 directed towards ascertaining the students' perception of the improvement in their capacity for analysis, reflection and synthesis.

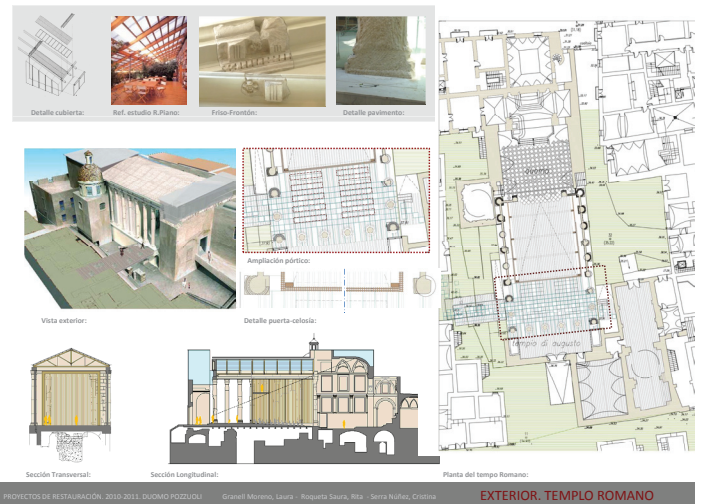


Figure 3. Competition for the restoration of the Tempio-Duomo de Pozzuoli (Students: Cristina Serra, Laura Granell, Rita Roqueta)



Figure 4. Detail of the competition for the restoration of the Tempio-Duomo de Pozzuoli (Students: Cristina Serra, Laura Granell, Rita Roqueta)

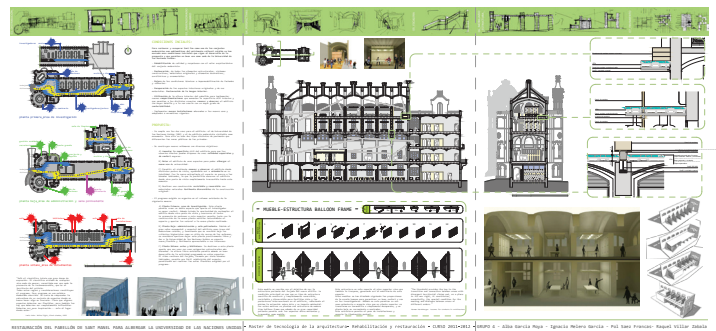


Figure 5. Competition for the restoration of the Hospital de Sant Pau (Students: Alba García, Pol Saez, Ignacio Melero y Raquel Villar)

3. Interviews with the teachers involved in the courses and with the invited design tutors.
4. Interviews with the students whose work reveals interesting facts.
5. Analysis of the exercises submitted.

The first pieces of evidence gathered regarding the usefulness of cooperative work in incorporating the specialized knowledge in the intervention in a building are very positive. This is especially true for the high level of attendance in the workshops and the overall evaluation regarding the how worthwhile the process was (8.1 out of 10 on average).

But beyond this overall evaluation, in the corresponding analysis of some variables from the questionnaires a high correlation in the following areas was found: *the discussion between experts improves the consensus of the design decisions, and the design decisions taken are more consistent with the preliminary study.* These variables are considered crucial for the ongoing pilot study and they offer good prospects for achieving the proposed aim.

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ENDNOTES

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16. El puzle o jigsaw es una herramienta de trabajo cooperativo que permite la involucración de todos los componentes especializados de un equipo para llegar más a fondo en un tipo de conocimiento (Aronson et al. 1978)