

CHANGES IN THE TRADITIONAL ARCHITECTURE OF CASTELLÓN, SPAIN. A LEARNING EXPERIENCE

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ABSTRACT:

Literature was the champion of the late nineteenth century philosophical movements that were responsible for disseminating a new form of perceiving and contemplating the landscape and man's relationship with it, from which sprang the association between nature and art, freedom of ways, a wealth of resources and physical and moral forces (Ortega 2004).

Interest in traditional architecture appears at the end of the twentieth century, intimately linked to the environment and the time in which it was built; the construction techniques used in the building process are therefore closely associated with the physical landscape in which they are located.

In the province of Castellón, Spain, the important elements of this traditional architecture are primarily based on the use of stone, together with brick or earth walls (Rosas 2005). We start from the assumption that the factors influencing the selection of materials and construction systems in traditional construction are:

- The environment.
- Craft skills, local knowledge.
- The economy and the medium.
- Building use.
- Function of the building elements.

In 2006, Building Engineering students carried out an analysis of over 60 traditional buildings located in the regions of *La Plana Alta*, *Els Ports* and *El Maestrat* in the province of Castellon, Spain. The analysis covered building typology, construction systems, materials, environment and history of the building, to verify the validity of the above assumptions.

This report also describes the building systems and materials characteristic of these areas, and the changes they underwent over the twentieth century due to the effects of the market economy on industrialized products, which have come to shape a new, recycled and continually evolving architectural vernacular material.

INTRODUCTION

At the beginning of the 20th century, the evolution of the growing heritage value of local towns to the nation revived memories of local stories, customs and dialects. Many of them were recovered or simply reinvented as festivals to promote popular celebrations of a regional or national character.

At a regional level, the population's properties were their popular heritage, genuine in its customs and beliefs, the true expression of its people, their possessions and their essence. To save these qualities from the aberrant influences of modernity and political liberalism, specific legislation was established to control all interventions in our national and regional heritage. We aim to criticize the new systems and materials adopted from contemporary architecture which are used

in residential heritage, without defining a specific construction style. Such a construction, like a farming house, an old house, does not involve the individual work of an architect, but is the work of generations of skilled craftsmen through traditional trades.

The loss of the artisanal and rural character invites us to reflect and contemplate the nature of rural areas—while not ignoring technical progress and enthusiasm for reform—following the architectonic perspective of recovering the “gesture” of old constructions by observing and feeling in accordance with technical analysis. The consequences of modernization and increasing mobility, namely the diversity of aesthetic normalization and the vandalism of traditional beauty, has virtually turned popular tradition into folklore.

The educational methodology used in the project consisted of bringing students into immediate and direct

contact with a real situation through intuitive learning, which values the natural medium of knowledge and experience in the approach to the small villages, their character and their history, their customs and traditions as reflected in their constructions. Over a period of three years, this experience was undertaken with Building Engineering students in the study of vernacular architecture, favoring the development and encouragement of relations between the local population and the university as a two-way method of learning about regional culture.

A popular early 20th century writer said that “the local customs and heritage must be let into the free air, with the land and the landscapes as the first object of attention”. These considerations are taken into account in the study and analysis of popular architecture in the region of Castellon.

Consequently, Project Based Learning (PBL) methodology was introduced on the first year of the Building Engineering degree. This methodology aims to improve reflective student learning, as well as coordinating the subject content teachers introduce. Students and teachers thus follow the same path to develop real project documentation. The first year project is based on a traditional building, which students must analyze from different angles, according to the different disciplines involved: History of construction techniques, Construction I, Materials I, Geometry, Graphic Design, Surveying, and Physics. It provides them with the knowledge and the experience to carry out professional tasks in the real labor market.

In recent years, this methodology has enabled students and inhabitants to re-examine issues related to traditional architecture. The buildings and the systems with which they are constructed should be a common heritage for the whole village, and this type of methodology represents an excellent way of recognizing its value. This value will be transmitted to social agents through public relations, teaching publications, meetings and cultural days. Concern for aesthetic education and inventory creation is an additional facet of the study program. The preservation of old architectonic beauty and the surrounding areas form the base for our teaching.

1 WORK OBJECTIVES

Society demands that the knowledge gained during university studies should be applicable to professional practice. For this to happen, theoretical knowledge must be applied to real sectors of production during the study process.

Future higher education study programs should be designed to provide students with the abilities and competences that lead them into professional activities.

The professional building engineer needs personal skills and technical capabilities to develop coordinated projects on time according to economic and technical planning. Students therefore require a more reflective way of learning.

It is important to recognize and include higher education in any plan of action for old buildings, to help adapt study programs to traditional needs. The learning process in higher education should follow environmental and conservation rules in order to seek creative solutions.

Teachers of new professional subjects on Building Heritage in our engineering courses should develop the following competences:

1.1 Main objectives.

- 1. Building process management in traditional houses. This involves controlling the quality and bill of quantity of all building construction elements and services according to the project documents, and registering all changes on a finally defined project.
- 2. Design compatible solutions for adaptation of projects and consolidation of plans on site. Coordinate recovery processes on safety interests during project definition and construction process.
- 3. Develop technical activities related to all heritage recovery phases: calculation, bill of quantities, value, viability studies, building inspections, leveling plans, etc.
- 4. Design and manage projects according to current legislation.
- 5. Building maintenance management. Definition of Life Cycle studies for construction material and elements. Environmental site management.

1.2. Basic competences.

Professional competences required are:

Productions systems, cost analyses, financial sources and financial plans based on budget.

- 1. Knowledge of building materials, building elements, traditional building systems and prefabricated elements. Physical and mechanical properties.
- 2. Management of the correct selection of building materials according to building typology and use. Management of on-site quality control of building materials and building processes. Ability to understand the test material results and final building element testing.
- 3. Identification of building elements and building systems, definition of their function and their compatibility during the construction process. Design and provision of solutions to construction details.
- 4. Knowledge of the control procedures implemented during the construction processes.
- 5. Application of technical requirements.

occupations and this is reflected in the morphological transformation of the vernacular architecture.



Craft skills, the local genius

Homes are generally better preserved in urban areas due to the quality of materials used in their construction or simply by the increased flexibility available when they are transformed or adapted to the demands of circumstances. But the farmer's house is more closely related to the natural environment in which it was built. Most often their understanding is closely linked to the landscape, and eventually forms a natural and endearing symbiosis, turning vernacular architecture, from the anthropological point of view, into a priority and an essential element in understanding and studying the social evolution of the region.

The use of the building

The different uses of the building mark the course of its history, but what determines its character is the purpose for which it was originally built, which in turn determines the materials, systems and dimensions of its interior spaces in accordance with the activities and residents for whom the building was constructed. The house of a cattle breeder will never be the same as an arable farmer's house, nor that of a carpenter or a blacksmith, although they may all bear exterior resemblances.



The function of the building elements

The rural house as a true illustration of agricultural life is the most conclusive physical expression and where the community's particular features are best seen. The materials used in its construction reflect the agricultural laborer's perfect adaptation to the physical environment, and thus represents the most closely related aspect of his own existence. Not surprisingly, the farmer's house may be considered as a part of popular art that has most influenced all creative fields.



This analysis will draw conclusions about which practical activities improve the development of professional competences, through the project-based learning program undertaken with first year Building Engineering students at Jaume I University in conjunction with small village councils in the region.

3 CONCLUSIONS

Results from the last three years based on 50 case studies lead to the following conclusions:

All activities planned on the project in line with the first course subjects are related to basic or specific competences in heritage fields. The activities students valued most highly are those related to transversal knowledge or basic competences: those that allow them to attend meetings, present solutions, work in groups, make decisions, etc. These activities are difficult to develop during normal practical laboratory activities.

The most important values noted by teachers are:

- A consistent theme running through all subjects, focusing on the needs of future building engineers working on historical constructions, consistent with the quality of content and a common teaching methodology to be inculcated through our popular heritage.
- Some practical exercises to implement the theoretical content from different perspectives which should enhance the overall work presented here.

From the experience to date, we may conclude:

That through this research we have related professional competences to project activities for first year Building

Engineering students. We can thus discover ways of implementing issues that the student values if these activities are related to professional aims. This will help to improve future intervention or research projects that are planning to maintain, change or include new activities.

From information gathered in questionnaires completed annually by students, focusing on improving course subject interaction and their particular focus on the heritage analysis, we can claim that improvements are gradually being adopted in teaching that have increased teacher motivation through this project. Together, teachers take part in monitoring the project and offering a critical perspective from their subject point of view, thereby optimizing content quality and avoiding duplication with other directly related disciplines.

Added interest by students and continued multidisciplinary research, particularly in the field of new technologies and new materials, will enable us to create a specialty in the field of traditional and contemporary construction systems. This allows themes to be proposed for the development of post-degree work in this area, and in turn provides a starting point for future research projects, through the creation of a purposely designed institute in the field of Old Architectural Technologies.

In addition to serving as a link between the people of Castellon's inland villages and university, by means of workshops, work camps, lectures and symposia, and teaching experiences in the field of traditional building, the project also pursues interaction with local builders who can recommend or caution on the appropriateness of new construction materials adopted in the rural field.

Thus, students are informed from the start of their degree, when they are expectant and curious about the purpose of the project. This information will motivate them to develop these activities because they will equip them with the skills they will later need in their professional lives.

4 REFERENCES

- Fuchs, E. 2004, "Nature and Bildung: Pedagogical Naturalism in Nineteenth-Century German", in: *The Moral authority of nature*. University Chicago Press, Chicago.
- Guerrero, S. 2002, "Antonio Flórez, arquitecto (1877-1941)", en Catálogo de la Exposición en la Residencia de Estudiantes, (febrero-marzo de 2002). Publicaciones de la Residencia de Estudiantes, Madrid.
- Miguel, J. 2003, *Arquitectura tradicional de la Comarca de Omaña y Valle de Samario*, Instituto Leonés de Cultura, León.
- Ortega, N. 2004, *Paisaje, historia e identidad nacional*, UAM Colección estudios, Madrid.
- Rosas Artola, M. 2005; *Rajoles, teules i taulells als edificis de Castelló de la Plana durant els segles XV-XVII segons el*

documents de l'Arxiu Històric Municipal. Boletín de la Sociedad Castellonense de Cultura, Tomo LXXXI, Julio-Diciembre 2005, Cuad. III-IV.

- Torres, L; 1933, "La vivienda popular en España", en Carreras Candi, F., *Folklore y Costumbres de España*, Barcelona.
- Sánchez, A, Martínez F., 2006, *Apuntes sobre la vivienda tradicional en la región de Murcia*, Jarique, Murcia.
- Gallego, T, López-Mesa, B. 2007. "Implementation of Project-Based learning in Building Engineering in Spain" in. *International Conference on Engineering Design*. 28-31 August París.
- Gallego T., et al., 2008. "Analysis of the abilities developed by a placement in building engineering at Universitat Jaume I", in; *International conference on engineering and product design education*. 4-5 September. Barcelona.

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6 APPENDIX

Buildings analyzed over the last four years.

2005-2006

Chapel of Sant Vicent in Borriol.
Chapel of Les Santes in Cabanes
Chapel in Onda.
Chapel of Sant Jaume in Almassora
Villa Elisa in Benicasim
Traditional farmstead "La Palmera" in Alquerias.
Traditional farmstead in Artana.
Traditional farmstead "Blau" in Castellón.
Traditional farmstead of Benadresa in Borriol.
Traditional farmstead of Mosqueruela in Mosqueruela.
Traditional farmstead in Almassora.
Traditional farmstead in Almasora -2-.
Traditional farmstead "El Tosalet" in Benicassim.
Traditional farmstead of "La Portera el Grau" in Villafamés.
Second mill of Castellón.

2006-2007

Chapel of Santa Teresa, El desierto de las Palmas, Benicassim.
Chapel of La Magdalena in Castellón.
Chapel of Sant Antoni del camí "la mar" in Almassora.
Chapel of Sant Miquel in Nules
Chapel of San Salvador in Alcora.
Chapel of San Roc in Castellón.
Chapel of San Francesc de la Font in Castellón.
Church of Benicasim.
Traditional farmstead "Sede social juvenil" in Castellón.
Traditional house of "Els Caragols" in Castellón.
The large house of Los Aliaga in Iglesuela del Cid.
Villa La Plana in Castellón.
Traditional farmstead in Cuadra Saboner. Castellón
Traditional farmstead La Perla. Desierto de las Palmas,
Benicassim.
Traditional farmstead in Mora de Rubielos.

2007-2008

Chapel of San Isidre del Sensal in Castellón.
Chapel of San Nicolás in Castellón.
Chapel of Casa de la Vila in Catí.
Chapel of San Antonio in Vall d'Uxó.
Chapel of La Mare de Déu de l'Adjutori in Benlloch.
Chapel of Santa Quiteria in Almassora.
Chapel of Sant Miquel in Villafamés.
Popular museum of "Arte Contemporáneo" in Villafamés.
Chapel of La Mare de Deu de la Font in Castellfort.
Chapel of Santa María de la Magdalena in Moncofa.
Chapel of La Soledad in Mora de Rubielos.
Chapel of Sant Cristobal in Culla.
Old "El Cànem" market in Castellón.

2008-2009

Chapel of Sant Josep de Censal in Castellón.
Church of La Sang in Liria.
Chapel of Coll de l'Alba in Tortosa.
Chapel of Sant Antoni in Betxí.
House of El Ermitaño de San Cristobal in Benasal.
Chapel of Sant Vicent in Vall d'Uixo.
Church tower of El Fadrí in Castellón.
Chapel of Sant Sebastià i Sant Joan Baptista in Atzaneta.
Chapel of Ntra. Sra. Santa Cristina in Artana.
Town Council of Cabanes.
Chapel of El Santisimo Cristo del Calvario La Vall D'Uixo
Tower of El Rey in Orpesa.
Chapel of La Mare de Deu de Gracia in Vila-real.
Tower of El Marques in Torreblanca.
Chapel of La Mare de Déu De Gràcia in Villarreal.
Chapel of La Mare de Déu del Socors in Càlig.
Chapel of La Sagrada familia in Vall d'Uixo.