

Innovation and Constructive Culture

There is a strong need today to develop a teaching unifying the construction culture with a historical approach in order to stimulate the creative capacities of students in the field of technical innovation. Such a teaching aims at :

- Focusing on innovation with different examples of the past to approach and finally better analyse the **new processes of contemporary innovation**.
- Analysing the process of innovation **through the role of the different partners of the project**: client, architect, engineer, industrials, contractors,... and replace this process in its historical context in order to show that constructive innovation has strong links with the other fields of intellectual and social activity: art, science, economy, politics...

A project has already been developed in this direction at the EAN for the exhibition "The *pan de bois* in Normandy, architecture and identity" (study of traditional wooden framed buildings in Normandie). We analysed the architectural "objects" but also:

- studied the technical evolution through ages
- tried to understand how this building technique became a strong image of the identity of the region. So that today we can find, for example, building walls in concrete covered with paintings imitating the traditional wooden frame, which has nothing to do with the reality of the structure. On the other hand, the strength of the link between Norman identity and wooden frame has damageable consequences for heritage: public authorities tend to foster the destruction of old buildings made with other materials, like brick, which is wrong, in a historical point of view, since in the nineteenth century - and particularly for industrial buildings - brick was then one of the main materials used in construction.

The proposed teaching develops this approach as a workshop with 4th year students. As said, the understanding of the process of innovation relies on the following points:

- the relations between the different partners of the projects (architect / engineer - architect / industrial...);
- the issue of technology transfer;
- the cultural context (from art to science)

These lessons lead to:

- better know the world of engineers;
 - show that innovation is the product of a culture, of a historic period, just like art for example (indeed, we realized that students don't have this awareness)
1. The work of Gustave Eiffel can be used to show the links between the innovation in science (theory of the strength of materials for example) and industry (evolution of the production of metal), the role of the private railway Companies, their relations with modern finance (bankers).
 2. The new shells in steel made in the thirties emphasize the connexion between:
 - the new high resistance steel sheets produced then by the industry;
 - the new techniques of welding on the site, outdoors
 - the use of a new kind of scientific design method
 - the demand for bigger buildings (aeronautics)
 - Transfers of technology: from aeronautics to building techniques
 - The aesthetics of purity
 3. The industrialization of social dwellings in the 60's can be studied by analysing :
 - previous experiments in industrialization and standardization (XIXth century)
 - the role of the State through regulation
 - the new relations between engineers, contractors, architects and clients
 - the aesthetics of repetition and modularity
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Examples

Through this teaching, we would like to emphasize and then study different innovation processes without putting to the fore one or another.

- On this basis, we would like to help students be aware of contemporary processes for innovation and then help them find their own places/roles in this process as architects
- The aim of these lessons is also to make the students realize that architects don't have much power on the material production of a society so that they have to think in terms of strategy if they want to keep the control of their work.

Conclusion