

How Research into Technological Disciplines Influences Design Teaching: the Italian Case

Why does technology and construction research interfere so little with the teaching methodology of Architecture classes in Italian schools of architecture? It's not easy to answer. Do other countries have such a situation?

Within our Faculty a sense of duty in those subject-areas has often made us stand out from others. This is conveyed by offering, programming and inventing teaching programs related as far as possible to its general context; this may remarkably reduce the scientific level of a discipline (although it is itself difficult to estimate).

On the other hand, technological subject-areas teaching staff have always proved to have an ability to anticipate (events), or at least, a special attention to strategic architectural issues such as the environment, legislation, reclamation, maintenance, quality, the evolution of the building process and techniques, etc. Whereas in the fields of architectural design and composition seem to be strictly anchored to a traditional idea of architecture, in which either conventional techniques are taken for granted, or more updated views are suggested, but without a real technological and constructive culture to make them feasible.

Before the 1993 European reform, university research had poured into teaching thanks to a hermetic division of disciplines into compartments: everybody acted on his/her own and students could choose what they liked within a chaotic and disordered offer in teaching programs. Most subjects, above all in the last years of the course, were going to be characterised by complex matters, by proceeding nearly in parallel with investigation in progress, but incoherently from the whole context, with no educational purposes in multi-disciplinary integration.

The reform has compelled university to think over the possible links and aims among subjects, and to make an attempt to redefine the educational purposes which should have put all subject-areas in the difficult position of a common effort, by introducing laboratorial teaching for all design-based subjects (urban science, restoration, architecture, technology, construction science).

On the contrary technologists may have been the only ones who have posed themselves this problem seriously.

The teaching of architecture design has been given a major role in the vocational training, with at least a workshop a year, besides theoretical courses, and in most cases it hasn't developed into a consistent project

and in a teaching gradual sequence, taking advantage from the privilege of being ineffable and uncontrollable, of being devoid of any connections with the world of architecture and with its deep changes (in organisation, in processes, in production and legislation). Indeed students are not planning: they are simply doing architectural composition exercises (which is completely different) and, what's more, once in a year (a typical Italian fault).

Construction-related problems (that is a minimum level in the technology of architecture) are totally absent – as well as the simple idea of space organisation. Finally students are not even taught the basic elements of a "generalist" architect, on which planning their future specialization.

As regards self-referentiality in the construction theory and technique things are not better: engineers teach by using scientific and technical equipment without distinction, whatever public they speak to, in the same strict deductive manner. Architects are sometimes granted some simplifications compared to engineers which may as well result in harmful overall observations, which should be aimed at the receiver instead.

So in our schools of architecture technical-scientific education goes on through a strictly deductive method: you start from Mathematics to get firstly to Statics, and then to Construction theory; you finish your educational training with Construction Technique.

So the student's design experience is nearly devoid of those aspects related to construction practice. Most of his study is confined to pure noble theory. So the aspiring architect is prevented from integrating his diverse knowledge in order to develop design themes. His plans are regarded as forms and volumes without a frame or bone structure and with no technological devices, so devoid of any material substance and neutral towards it.

The same could be said with regard to all other subjects involved in the project. However I don't want the reader to think I'm in favour of empirical and vague teaching, only aimed to give instrumental knowledge, and meanly submitted to immediate reasons of application; scientific understanding of an architect's professional disciplines cannot be left out or neglected.

On the contrary I think that understanding scientific principles is essential to build a structure where progressive knowledge and continual learning are encouraged, even though with the passing of time those principles are forgotten. They are extremely useful in a rapidly changing and technically evolving world. The difference between a technician's knowledge and a more culturally qualified person is not only what you do, but the way you do it (cultural awareness and the ability to choose the right technical devices in the broadest sense: for instance the understanding of the primary and revolutionary role played by information technology applied to design and not only an instrumental use of photo-shop and autocad). What seems serious and intolerable is a snobbish indifference towards technical application of scientific and artistic knowledge. It's not a matter of choosing between science and technique, but giving each proper space and time.

In the chaotic teaching situation which characterises our schools of architecture, technological-oriented disciplines are making an effort to approach the basic project themes (and it seems to me the starting point

for mastering architecture and the growing changes in scenery) by trying to fill big gaps, to supply students with the basic elements of awareness in the meaning of architecture, which is to be regarded as a social, economic, collective, productive, material, environmental, constructive thing, something to live in, to maintain, to renew, to demolish, to look after people's safety, besides having the right formal standards.

So we are compelled to favour methodology; we give the basic elements to make students identify and formulate a design problem in every aspect. Students are encouraged to regard technological and building culture as the fundamental nourishment of correct design creativity, and to develop a critical design ability, as for a prearranged programme. We can hope to get to explain the nature of needs and performances as a method to look for solutions, the only bulwark of a contemporary designer vocational training.

Our recent introduction of the so-called 3+2 model, which has split up the five-year course into a three-year introductory but professionally-oriented course (in my view, an educational system which contains an irremediable contradiction) and a two-year course ("specialist degree") hasn't improved the situation: in each faculty it was interpreted differently. Sometimes it simply cuts up the five-year course (nearly swindling the student and the working world, since the first level degree doesn't correspond to any technical skill but it only gives a basic knowledge which can't be exploited without specialising). It might only serve statistics about the time needed to really reach the degree.

In some cases more technical-oriented three-year courses were born. Some of them are well-structured and culturally adequate but they won't easily allow students to become generalist architects by simply adding two further years without taking supplementary exams. But we leave this on other occasion.

Let's go back to technology and construction: the new research themes are various but not completely new. They have been dealt with for a long time and are at an advanced stage.

The connection between human settlements and the environment is one of them. This topic embraces many others, if we consider the whole lifecycle of the building product: the manufacturing of raw materials, goods production, the building process, maintenance and the perspective of possible demolition.

As you know, the consequences of aware environmental design are several and they aren't just a matter of energy saving and bio-architecture. These are major aspects but at present they cannot be taught because of the students' lack of time and of the teachers' shortage (except for post-graduate studies: masters or doctoral research).by the way it is essential to try and awaken students to the consequences on the territorial balance produced by their decisions. For this reason, in basic teaching we strive to supply the fundamental criteria and devices (see Adriano Magliocco's contribution) and we hope there will be a future autonomous germination.

Another major theme at the moment is the control of life of architectural work. This is a very complex theme, because it is connected with the

variability the obsolescence of architecture, both in functional and social aspects, and in the physical. The multiplicity of building techniques and materials, and the great number of possibilities of juxtaposition of design choices, make it difficult to foresee and programme the durability of an architectural product. This concerns as well some problems such as quality evaluation systems and contracts of guarantee, in addition to a large area including planned maintenance and the redevelopment of current buildings, even recently constructed.

Another fascinating theme is about the form of collaboration and co-design with manufacturing industry. New handmade products and components have been developed in the last few years in areas which are not traditionally involved in construction, but they are extremely interesting for both this boundary-operating designer and for those architects who are in charge of linking design and production.

And the list could be longer.

All this is a part of the research areas developed by our Faculty's lecturers and researchers in technology. It goes without saying that it is impossible to introduce these themes in the ordinary teaching programmes of architecture courses only through technology classes. But it is also evident that there may certainly be some indirect consequences on the way of teaching Construction, which represents somehow one of the last elements of the whole building process in design. So how can we cope with the problem of little time and few teachers?

This restlessness springs from the conviction that the nature of design problems is bound to change, since lots of changes are taking place within and around it. However, there are some methodological aspects which are not upset by changes. Some of them are, to some extent, free from any considerations within the ideational and heuristic process of architectural design and its cyclical advancement by approximation and verification. But we can't underestimate the importance of the relationship between information and decision. Secondly the idea of construction cannot be regarded as the final process of many other processes which are not directly called into question. Just one example could be the Crystal Palace, whose building process cannot be imagined independently from the whole idea of the project (and from its transience), from the connection it has with industry, from the economical and social conditions in which Paxton made his work.

So how can we bring technological and construction research themes back to an architect's vocational training, in order to mend the deep tear, or the dichotomy between architecture and its feasibility? Of course I haven't found any special solutions which can be put into practice quickly and easily.

I would like to finish these notes, by mentioning a student's rep who pleaded movingly at our final meeting in Athens with regard to technical or artistic conception of architecture. "Please, don't make us choice" – she exclaimed.

These periodical meetings might be a lasting forum where to discuss ideas and experiences among participants, and favouring the creation of a cultural pressure group towards our Faculties of Architecture, making those lonely and unheeded voice more authoritative and European.