

# **An integrated experience of building design: on the educational and scientific role of a professional practice in the academic environment**

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**Abstract** — *Despite the obvious transformations in the way of thinking and designing contemporary buildings, there is still a persistent lack of articulation between the professions associated with it. The division of labour inherited from the historic separation between nineteenth-century architects and engineers has been strengthened with the increasing specialization of the agents now involved in the design process. The autonomy of views and approaches, driven by increasingly independent areas of expertise, has, as a main consequence, a very low degree of evolution in building specification standards compared to other sectors of design. The education of building professionals so tends to consolidate itself as a technical training averse to innovation. By doing so, the academy satisfies the interests of the building industry that can thus standardize its processes and products. This kind of scenario creates very unfavorable conditions for the actual coping with the real challenges of sustainability that imply, in contrast, much more synergy between the different areas of expertise in order to achieve integrated processes and solutions. This paper presents an integrated experience of learning by doing that involves teachers and students from various schools and courses offered by the Federal University of Rio de Janeiro, Brazil, among which are the schools of fine arts, architecture and civil engineering, now separated into their respective centers of arts and technology. This experience is developed through actual professional practice in an academic environment through the design of buildings for the university itself. The paper refers to a series of similar initiatives as precedents, but also as factual arguments for the establishment of institutional arrangements that allowed the recognition of this activity as something that should not be confused with either a traditional office, focusing on simple technical services, nor with the regular design studio teaching, alienated from professional responsibilities. It highlights some specific conditions experienced and suggests issues for a debate on the academic meaning of such a design practice, addressing the conflict still existing between professional skills and research implementation.*

**Index Terms** — *design education, design knowledge, design process, professional practice.*

## **INTRODUCTION**

The way of thinking and designing contemporary buildings has radically changed in the last century, but there is still a persistent lack of articulation between the professions associated with it. The division of labour inherited from the historic separation between nineteenth-century architects and engineers has been strengthened with the increasing specialization of the agents now involved in the design process. The autonomy of views and approaches, driven by increasingly independent areas of expertise, has, as a main consequence, a very low degree of evolution in building specification standards compared to other sectors of design. The education of building professionals so tends to consolidate itself as a technical training averse to innovation. By doing so, the academy satisfies the interests and comforts the building industry so that it can standardize its processes and products. This kind of scenario creates very unfavorable conditions for the actual coping with the real challenges of sustainability that imply, in contrast, much more synergy between the different areas of expertise in order to achieve integrated processes and solutions.

In this sense, we can see a double movement of disruption: the separation between teaching and practice, supported by the gap between an elitist university and the society as whole, and the fragmentation of content into disciplinary specialties that make the curriculum of our courses increasingly compartmentalized. This seems to contradict the intentions of those who continuously advocate the construction of a disciplinary field for design. As noted by Nigel Cross [1], the agenda contained in the now quinquagenarian "Sciences of the Artificial" [2] suggests that professionals involved with the design activity, no matter what area of expertise they belong, should be able to carry on a conversation

about design, and therefore perceive the common creative activity in which they are all engaged, sharing their experiences of the creative and professional design process.

## **A FRAMEWORK FOR A PROFESSIONAL DESIGN PRACTICE IN ACADEMIA**

Moved by the desire to fight this disruptive process and concur to address design as a discipline, we have been conducting, since 2006, a design professional activity that has proved to be capable of providing an integrated experience of learning by doing called *Atelier Universitário* (University Studio). It proposes to implement in the academy a professional activity directed toward the provision of services by the university to society in general, but also to the university itself.

The creation of this structure has two main origins. The first one comes from a top down decision and is related to a general public outreach policy implemented by the current principal administration which aims to stimulate and develop interdisciplinary activities that could provoke and promote conditions to favor the integration of the different undergraduate courses offered by the Federal University of Rio de Janeiro. This policy assumes that the role of universities should transcend their traditional roles of teaching and research, linking them to concrete actions designed to serve the population, especially the less privileged social classes. The foundations of this thought are committed to social change and are related to the political militancy of both teachers and students. These grounds have become a paradigm for higher education, especially in Latin America, where the long desired interface between the knowledge produced within the university and the local culture has begun to be increasingly present [3].

In 2004, drawing on previous experiences, as those of the Law School or of the School of Social Work among others in Federal University of Rio de Janeiro, the principal administration promoted a kind of broad public outreach program which involved what was then called the 'Public Offices' of architecture, civil engineering, etc.

The second origin, unlike the first, is a bottom-up individual initiative of a new generation of teachers dissatisfied with a practical design teaching model divorced from professional practice [4]. Taking advantage of opportunities here and there for concrete action within the university's own areas, such action has revealed an unsuspected field for developing a design education that could be much more driven by professional conditions. Performed in an academic environment, this practice can also offer favorable conditions to conduct critical and experimental exercises as grounds for university-level teaching and research purposes.

### **Working infrastructure**

The shaping of this structure was impelled by an opportunity to design a large project commissioned by the Institute of Medical Biochemistry, a building of three thousand square meters designed to house research laboratories. This experience involved teachers and students from more than 20 different departments of the Federal University of Rio de Janeiro. Among them are those of the schools of fine arts, architecture and civil engineering, institutionally separated into their respective centers of arts and technology.



FIGURE 1  
INTERIOR VIEW OF THE ATELIER WORKING INFRASTRUCTURE (SOURCE: ATELIER UNIVERSITARIO, FAU-UFRJ)

Withstanding this separation and taking advantage of the success and visibility gained internally and externally through this first experience, we were able to set up a studio that now occupies about five hundred square meters at the Faculty of Architecture and Urbanism. This physical structure was fitted as a counterpart of the more than fifty ongoing projects. The *Atelier* engages students from the various areas of engineering that work together with a staff of architecture and fine arts students. It now integrates the former ‘Public Office of Architecture’ as a design branch that answers demands of social interest, but also includes teams linked to post-graduate and research programs that are concerned with issues such as social housing and historic preservation, thus aiming to unify and strengthen this new instance of design building professional experience in the University.

**Curricular inclusion**

The creation of the *Atelier* coincided in 2006 with the implementation of an ambitious curricular reformulation of the Architecture and Urbanism undergraduate course at the Federal University of Rio de Janeiro. However, more than a mere coincidence, it was a joint action directed toward the development of greater internal and external integration of the course. Produced and discussed during the three years prior to its deployment, the new curriculum provides a series of changes that seek to articulate both teaching and research to their outreaches. Among the main changes is the organization of the course in three cycles, where the second round, that goes from the fifth to the eighth semester succeeding a first two-year foundation period, is now openly aimed at deepening design knowledge [5]. This cycle includes the new educational requirement of a mandatory supervised professional training, as well as a new range of thematic design studios (TDS) directed to issues with great potential to experiment with concrete design opportunities, such as social housing, alternative urban planning and educational design.

The combination of these changes clearly favored the institutional consolidation of the *Atelier* as a structure suited to accommodate professional training. This is due to two main reasons: the first is related to the fact that supervision becomes easier and more effective due to the proximity the supervisors have with the education developed within the university, and thus the chance to guarantee a professional training grounded on pedagogical purposes. The second reason refers to the concern that the professional internship could become even more precarious as its mandatory character might make the trainee more dependent and subject to the conditions imposed by a market of poorly paid labor. Furthermore, we saw in the *Atelier* a unique possibility to apply and implement design research.

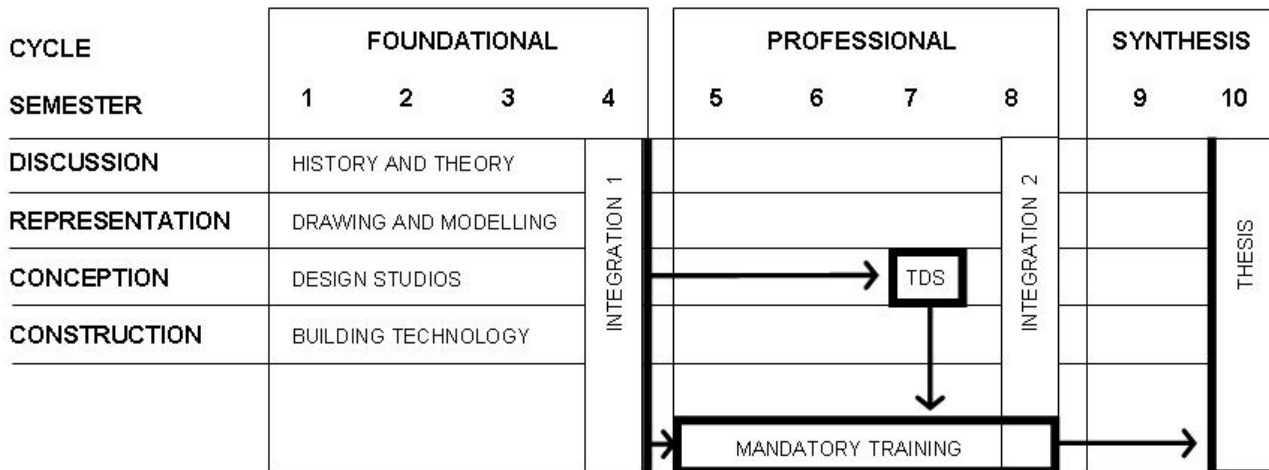


FIGURE 2

CURRICULAR INCLUSION OF THE ATELIER ACTIVITY THROUGH MANDATORY TRAINING (SOURCE: ARCHITECTURE AND URBANISM 2006 CURRICULUM)

**Scope definition**

Despite these very favorable conditions, the biggest problem we faced concerned the definition of the scope of professional activities that could be developed by this kind of structure. The issue of delimiting the field of action involved deep preconceptions, such as unfair competition with private offices, lack of professional competence and the slower pace of design processes that involve teaching and research.

In order to face the challenge to define the scope of the desired practice, we looked for precedents to be used as factual arguments in order to conform the institutional arrangements. These references allowed the recognition of this activity as something that should not be confused with either a traditional office focused on technical services, nor with an academic design studio alienated from professional responsibilities.

An early precedent was observed on a visit to the Faculty of Architecture of the National University of Mexico [6]. It had been inspired by the model already established by the university's research centers in engineering, that had absorbed much of the design activity and technical study of former private engineering firms, unable to withstand the successive crises that have plagued our Latin American economies.

However, our main reference was provided by an academic institution whose aspirations were somehow analogous to ours: the University Hospital. This structure whose existence is considered essential to the quality of a medical school, is conceived as a means of practical training for professions in the medical field. Moreover, it associates two interesting aspects: the clinic and the laboratory, which are, respectively, a public service devoted to society and a cutting-edge research facility that gives academic meaning to that structure and distinguishes it from other public health facilities. The University Hospital has thus provided an important means to justify the need and the possibility of reclaiming a design activity in an academic environment that should not be limited to social service, but should also include efforts of scientific interest associated with the urgent development of research and innovation [7]. Indeed, this analogy allowed us to tackle the false idea of an unfair competition with the professional structures, leading, instead, to the recognition of the complementary role that this kind of structure could play as a scientific partner of the vast majority of offices whose scale, organization and economic fragility prevent the creation and maintenance of design research and development capable of countering the standardizing logic of the building market in Brazil.

The major achievement allowed by this analogy is yet to come. It concerns the recognition of design activity as a means of scientific research. This has led us to other references, among which is the experience developed by the Master in Architecture from the Catholic University of Chile, presented in a lecture by Jose Rosas in an important academic meeting concerning the architectural project held last year in Sao Paulo [8]. This experience illustrates a whole new field of possibilities for the development of real projects in an academic environment conducive to the flourishing and strengthening of an innovative practice, based on the inquiry into new design theories, rules and procedures that can support the necessary adaptation to the constant changes in the realities of professional performance and the consequent acquisition of cross-disciplinary skills in design education [9].



FIGURE 3

EXTERNAL VIEW OF THE PROJECT FOR THE INSTITUTE OF MEDICAL BIOCHEMISTRY SHOWING SOME OF ITS PASSIVE AND LOW ENERGY DEVICES  
(SOURCE: ATELIER UNIVERSITARIO, FAU/UFRJ)

## TAKING CONTROL OF THE DESIGN PROCESS

The organization of this type of structure is inspired by the practices of technical expertise that already exist and are generally associated with research centers, but seeks to transcend this simple university-business partnership to implement a professional activity in which the academy does not only play the role of a mere scientific-technical support to professional bodies, but is able to take control of the design process as a whole.

The motivation to assume this commanding role is justified by the urgent need to provide more favorable conditions to face a dual challenge with regard to further integration in the design process as well as innovation. For this, we must break with the building design traditional practices that tend, in the overwhelming majority of cases in Brazil, to perpetuate procedures and solutions and standardize specifications conditioned by technologies that are already consolidated by market and building industry.

An integrated design, based on the combination of different areas of expertise, demands an effective participation of different specialists from the earliest stages of the design process. Decisions of major impact for the project are made in these early moments in which architects are usually destitute of dialogue with other professionals and thus tend to favor schemes already known or seek to naively attempt a more risky, but poorly apprehended, fashion inspired solution. Even in this case, where innovation can somehow be reached, experts, entrenched in their knowledge territories and barred from the design process by having been belatedly invited, tend to defensively distort any attempts that might weaken their desired field of expertise or counter their formulas and recipes derived from a blind respect for rules.

This is a real vicious cycle that ties the engineering education to the perverse logic of an increasingly specialized professional market hit by an accelerated process of fragmentation which, in turn, actively contributes to the compartmentalization of design knowledge. Deprived of their ancestral functions, architects still cling to a persistent and wistful belief in a full design expertise that cannot withstand the pressures of a building industry interested in optimizing investments through to the standardization of processes and products. Such pressures are even more sensitive when the standard becomes a mandatory norm, as is the case of public building contracting procedures in Brazil, where technical choices are restricted to a list of construction techniques and materials officially controlled by economic criteria, but that can hardly resist a global cost analysis. From this list are also summarily excluded innovative processes and products whose processing and marketing could possibly counter the noble but falsely established principle of free competition, since we all know that in our societies, sectorial agreements undermine such principle. As designers, we therefore become legally barred from implementing research on public works which should, instead, provide special opportunities to promote innovation, precisely because they are not strictly constrained by the criteria of commercial profit governing the private sector.

This situation is even starker when it comes to projects commissioned by the university itself, whose research is thus prevented from being applied. In addition to the difficulties generated by mistrust of professional bodies, we must add those that relate to a practical project that cannot yet implement research and thus be fully justified as an activity of teaching and scientific inquiry. These difficulties have fueled the prejudice that still prevails in academic circles regarding the nature considered unscientific of what is often pejoratively described as 'technical work'.

There is therefore urgent need to develop new means to enable us to withstand this relentless dichotomy between professional practice and academic activity, especially in our disciplines as closely tied to the practical knowledge of design.

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