Re Conceptualizing the Design Studio: Blending Academia and Architectural Practice

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Introduction

From antiquity to present the architectural education, the professional practice and their interrelationships have suffered transformations. In the last decades changes undergone by the architectural profession have fostered the emergence of innovative forms of architectural practice. The teaching of architecture and the profile of the architect are not left out of these changes. Thus, the traditional pedagogic models need to be reconceptualized in order to train a new kind of professional and to interweave again connections between academia and profession.

The aim of this document is to explain the factors that have transformed the teaching of architecture and the professional practice and to understand their interrelationships. This work is structured in two parts. The first part explores the different connections that have existed between the academic and professional realms across history. The second part focuses on new professional models and their influence on the training of architects.

The teaching of architecture and the professional practice

Through history, the teaching of architecture and the professional practice have undergone major changes caused by specific social, cultural and economic circumstances. As a result of these transformations, the role of the architect, the representation techniques and the interrelationships between teaching and practice have also changed.

The simultaneity of the learning of architecture and craft during the construction process

In the Ancient times the learning of architecture took place during the construction process of a building. The architekton (term used to differentiate the architect of all the workers of a construction) received training in the workplace where learned the craft from their own failures and successes. In addition, the architekton could also acquire artisan training and basic knowledge in mathematics and geometry.

As learning and practice were made during the construction process, the architekton had to be an ingenious person with a constant commitment to resolve all kind of artistic and technical problems.

Communication between the craftsmen and the architekton was usually verbal but, sometimes, the use of drawings was necessary to resolve eventual problems on the site (Kostof, 1984).

In the Middle Ages the learning of architecture also happened mostly during the construction phase. The term ‘master builder’ was used in Western Europe to designate a craftsman whose skills and knowledge as a supervisor and coordinator of a building stood out over the other members of the guild.

The practical training of the master builder was carried out through experience in construction and an apprenticeship system established by the guilds which ensured the transmission by inheritance of the knowledge and a continuity of the craft (Briggs, 1927).

The master builder, in addition to communicate orally, also used diagrams to transmit his ideas. The summary of these drawings in portfolios, as the Villard de Honnecourt’s collection, was a common practice among the master builders of this period. The objective of these compilations was to collect the knowledge of geometric rules for its subsequent application in the construction or the instruction of future generations.

The separation between the design phase (learning) and the construction phase (craft)

During the Renaissance there was a separation between the design and construction phase of a project as consequence of the systematization of the representation techniques. It was at this time when there was a distinction between the learning and the practice of architecture and between the master builder responsible for the technical aspects of the building and the artist (term used to designate the architect) dedicated to the tasks of design (Ettlinger, 1984).
The admiration for the classics and the discovery of the ‘Ten Books on Architecture’ of Vitruvius was the turning point that served to define the figure of the Renaissance artist and his corresponding tasks. Following Vitruvius’s texts the education of the artist focused on the personal study of the Liberal Arts (medicine, geometry, music, literature) and the classical architecture. The artist, additionally, continued to receive training in craft workshops although it was focused on dealing artistic aspects. By his training the artist was considered a versatile, erudite and individualistic person capable of performing any type of artistic and intellectual work.

The use of disegno as a means of graphic expression of an idea or concept was important to differentiate the artist (creator of the idea) of the master builder (executor of the idea) (Madrazo, 1995). Renaissance drawings (plans, elevations, sections and perspectives), unlike the medieval sketches used to solve a practical problem in the construction, became conceptual tools with which the artist could devise and conceive a building before its construction. Consequently, the artist was required to be responsible for the artistic details of the building but it was not necessary to have a leading role in the construction.

The separation between the teaching of architecture and the professional practice

In the eighteenth century, first in France and then in the rest of Europe and United States, the first official art education centers were created under government supervision. The aim of the new academies was academically organize the teaching of architecture so that architects could obtain a professional degree backed by the state. The result was the division between the theoretical education of architects and professional practice and the professionalization of the architect’s craft. Likewise the term architect, as we know it today, began to be used to differentiate the labor and the social status of architects of the tasks done by master builders and artists.

The École Nationale et Spéciale des Beaux-Arts in Paris was one of the first schools that educated architects using a previously established academic program. The most notable contributions of French educational model were: the combination of theoretical lessons taught in master classes with practical exercises carried out in workshops (ateliers), the organization of a competition system (concours mensuel et annuel) to promote the self-improvement, the hiring of professional architects as teachers to guide the student and the use of various types of artistic drawings (esquisses, projets rendus et éléments analytiques) to graphically represent a project or some conceptual ideas (Drew Egbert, 1989).

The professional practice determines the academic program

Throughout the nineteenth century, the new professional demands in the field of industry, trade and construction in Europe prompted a series of education reforms whose aim was to bring together theoretical teaching and practical learning in a single program to provide a general education to architects and engineers based on scientific grounds.

The École Polytechnique and the École Centrale des Arts in Paris were the first training institutions for architects and engineers that employed a systematic teaching model in architecture. The purpose of its founders was to centralize technical and scientific instruction of architects and engineers. With this aim they created the modèl polytechnique and the modèl industriel that combined the Sciences pures taught in lectures with the Sciences appliquées carried out in laboratories and workshops (Pfammatter, 2000).

The educational objectives of both models were to encourage interdisciplinary work between architects and engineers, to connect the theoretical principles of architecture with its practical application using the géométrie descriptive as a graphic method to solve and represent technical problems in three dimensions and to establish direct contact with the professional practice through the hiring of a teaching team of experts and practical activities such as visits to the building or specialized factories.

The learning of architecture and the professional practice take place in the studio of architecture

During the nineteenth century prosperity in trade and industry contributed to the birth of the architect as a professional and the creation of the first studies of architecture (Woods, 1999). As result of this professionalization of the craft was necessary to establish a well-organized model of practical learning so that architect -as independent designer and supervisor- could learn the profession in the same place of work.
This apprenticeship system basically consisted of hiring young architects for a period of two to five years. The cooperative effort that had characterized French academic workshops now was transmitted to the professional field. The members of the study (from the youngest to the oldest) were a team which helped each other under the supervision of the chief architect. This way of working allowed pupils understand ‘in situ’ the organization of a professional studio as well as the development of the profession in a real context. After the training the young architects opened their own studio or just continued to work at the same place.

It was at this time when the architects began to set up the first professional organizations such as the Royal Academy in England or the American Institute of Architects in the United States whose purpose was to promote the common interest of architects, improve the quality of professional services, encourage recognition of the profession among the public and establish some rules for the education of architects.

The academic program determines the professional practice

In the twentieth century some of the ideas on social, artistic and educational renewal, which had begun during the Industrial Revolution, were developed and implemented in the academic programs of some schools and academies in order to establish a technical and artistic education which was suitable for new industrial and professional demands.

In this context, the Bauhaus was created as a center of convergence of different educational, artistic, political and social currents. In its first phase the school was influenced by the traditional ideal of the medieval guild while, at later stages, dominated an educational program based on new technologies and mass production (Wick, 1982).

The training of students in the workshops of the school was an opportunity to establish direct contact with the professional field. The experimental works that were carried out in the school, subsequently, were reproduced and sold by companies close to the Bauhaus. For the realization of these prototypes students used all kinds of representative systems from collages, sculptures, paints to analytical drawings.

In years after its closure, the pedagogical model of the Bauhaus had a significant impact in schools of architecture around the world. However, although the ideas of the Bauhaus had transformed the architectural education, the learning model based on the Design Studio remained virtually unchanged.

The integration of current teaching models in the new professional processes

New forms of professional practice

In the last decades, changes undergone by the architectural profession and the continuous development of ICT have fostered the emergence of innovative models of architectural practice based on collaborative working methods and virtual organizations structures.

In the field of architecture, engineering and construction (AEC) professionals are working in a variety of organizational structures ranging from small studios (the majority) to large architectural and engineering consultancies (the minority). However, regardless of the scale of organization, design and construction of buildings is becoming an increasingly complex activity that involves different professionals -architects, engineers, manufacturers, builders, suppliers- with different levels of knowledge and professional experience. Often these professionals must work together in transitory teams that are geographically distributed throughout the world. These professionals tend to collaborate on a specific project until the task has been completed and afterwards the group is dissolved. These types of organizational structures stand out for their temporary connections between professionals.

Nowadays, BIM technology (Building Information Modeling) is postulated as the most appropriate tool to facilitate communication and collaboration between different actors along the entire life cycle of a project, from the design phase to the construction phase and post-occupancy.

The use of the BIM model as an interface to create, collate, store and update information means for professional studies more effective communication among various experts that make up a team, a better understanding of the physical reality of the building and greater transparency in the decision-making (Chaszar, 2011).

Together with BIM technology, Integrated Practice can help to transform the linear process of design and construction in a networking process in which...
all members of a team work collaboratively from the early stages of the project (Elvin, 2007).

The basic concept of the Integrated Practice of overlapping the design and construction phases and integrating different experts in the process is not a new idea. In classical and medieval times the architektôn and the master builder were also responsible for designing and constructing a building with the help of craftsmen.

Currently, the integral management of the different stages of the life cycle of a project is an improvement in the quality and efficiency of the process because it offers a wide variety of services (beyond the traditional model), a comprehensive coordination of the different agents involved and a greater economic and administrative control whose result is to obtain more satisfactory products for customers and professionals.

In addition, new forms of collaboration in network -formed by a set of different companies or individuals with specific competencies (Burn, Marshall and Barnett, 2002) - can connect these dispersed teams so that they work together, regardless of their physical location, in the creation and management of the architectural knowledge. This type of networking leads to a form of collective intelligence that is inherent in the organizational structure. In this context digital technologies can support the exchange of knowledge throughout the design process, from conception of the idea to the construction. With ICT, the knowledge generated during the project can be modeled and stored in repositories of knowledge that can be reused in later projects.

As a result of these changes, new types of professionals are needed which are able to work and think in networks, to construct and share knowledge with other experts using digital media, to offer new services and to acquire the necessary skills in order to interact with knowledge bases available on the net.

In these circumstances, the challenge of schools nowadays is to train professionals with an instrumental mastery of new digital technologies and with a capacity of participation and cooperation in flexible and dynamic teams.

The profile of the professional architect

Today, the practice of architecture requires a new professional profile of the architect able to improve the domain of architecture by encompassing other disciplines in the design process and to combine different skills to be able to work creatively with other professional and non-professionals during the whole design process from conception to post-occupancy.

The role of the architect as an independent designer (characteristic of the last century) nowadays is changing towards a new profile whose duty is to coordinate a group of specialists (Robinson, Jamieson, Worthington, Cole, 2012). Due to the complexity and extension of current projects, it is necessary to divide the work in different areas of specialization. Therefore the architect, in addition to providing some important creative decisions during the process of design and construction of a project, also has as main tasks to organize various professionals and to manage the knowledge produced during all stages.

However, the education of architects is still primarily focused on the design of projects understood as individual creations. Therefore it is necessary to introduce in current academic programs new teaching methodologies that promote interdisciplinary teamwork and introduce the new emerging specializations (energy and efficiency in buildings, infographics, intervention in cultural heritage, real state analysis, sustainable construction, cooperation and development in third world countries, calculation of facilities or structures, technical inspection of buildings, public administration, research and teaching, project management, facility management, etc.) Thus students would be able to operate with different groups and situations as well as to work in the projection of buildings but also in other fields of architecture and other disciplines related to this.

The training of new professionals in the schools of architecture

In this context, it is necessary that schools of architecture review the traditional pedagogic models in order to develop and apply new methods of teaching and learning which go beyond the established academic curricula. The blended learning is one of these pedagogical approaches that schools are beginning to use to bridge the gap between academia and professional practice.

In most schools, the Design Studio is still a simplified model of professional practice where students and teachers adopt some roles (architect, client) and simulate real conditions (brief, site,
budget and construction techniques). The Design Studio is also characterized by being, in turn, a physical place in which learners interact and a space -in a non-physical sense- where knowledge is created during the development of a project as a result of ‘knowing-in-action’ and ‘reflection-in-action’ processes (Schön, 1983).

In contrast to this closed system with a limited place and time the implementation of blended learning has meant a change in the way to teach the architecture. The use of a model that combines the computer-assisted forms of learning with the social aspects of face-to-face communication (Achten, Koszewski y Martens, 2012) has helped establish an open education process that can start anywhere, weaving bridges with other disciplines, expand over time and promote community building and the social learning.

An example of this type of learning model is the OIKODOMOS project. The aim of this pedagogical model is to create a virtual learning platform (OIKODOMOS Virtual Campus) where teachers and students of different schools of architecture and urban planning collaborate in the design and implementation of on-line and on-site learning activities dedicated to the study of housing in the contemporary Europe (Madrazo and Riddy, 2011). With the help of ICT technologies, blended learning enables these institutions to stick with their existing academic curricula and supports the design and implementation of learning activities in collaboration.

New connections between the architectural education and the professional practice

Although the Design Studio is still at the core of teaching in architecture its reconceptualization is necessary to transform the way architects learn. Thus, we can see today the Design Studio as a network of places -physical and virtual- where different types of learners (students, experts, citizens) and institutions (universities, professional organizations, communities of citizens) can participate in the design process and, simultaneously, collaborate in the construction of the architectural knowledge.

This new participatory model -open and dynamic- would enable schools of architecture to eliminate the rigid structures of current academic programs and overcome the separation, which stems from the eighteenth and nineteenth centuries, between the academic and professional fields. On the other hand, this model also would provide students -through the direct participation of various learners in the design and construction process of a project- the opportunity to improve their skills in areas as diverse as design, collaboration and communication, to have a firsthand experience about the real problems of the profession and to acquire cross-architectural knowledge.

Recently, some schools have begun to develop and integrate new educational projects based on experiential learning and cooperative learning. For example, the University of Edinburgh (Scotland) has created a participatory model where students in collaboration with various professionals of the AEC sector carry out a real project during one academic year; the School of Planning and Architecture of New Delhi (India) has developed a social model for small projects and interventions in public space with the cooperation of local citizens and the University of Virginia (USA) has created an interdisciplinary model which brings together students of architecture, urban planning, art and medicine to rehabilitate (from sustainable, humanistic and artistic points of view) forty acres public wetlands park (ACSA, 2012).

Conclusions

The teaching and practice of architecture, from antiquity to the present, have undergone continuous changes. However, it has been in recent years when changes in the professional field have increased exponentially fostering the emergence of new forms of practice and a greater disruption to the academic field. As the profile of the architect and his training continue based mainly on educational models originated in past times and unrelated to the current needs of the profession it has become necessary to create new ways to intertwine academia and professional practice. Schools of architecture have begun to develop and implement, often with the help of ICT, new pedagogical models which aim is to form a new profile of architect who is capable of working in interdisciplinary and temporary teams in the current and future professional context.

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Notes

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