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DESIGN STUDIO, COURSEWORK AND COMPLEMENTARY PROJECTS – A TRANSITION FROM THE BASICS TO THE SYNTHESIS OF ARCHITECTURAL DESIGN

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ABSTRACT
In addition to the practical knowledge imparted during design studio projects, architecture students amass theoretical knowledge in a wide array of subjects via coursework, and complementary, practice-based knowledge regarding urban planning, structures and architectural technology. The aim of this paper is to examine the relationship between the practical and abstract knowledge input of these three aspects of architectural education, using the curriculum of the "Ion Mincu" University of Architecture and Urbanism as a case study. Finally, the paper will propose a few key principles for ensuring the optimum ratio between these educational components.
Keywords: Architecture education, practical exercises, design studio, teaching methods, relfective practice

1. Introduction

Apart from creativity and inspiration, architectural design entails the practical application of abstract knowledge according to a complex set of context-related, co-determinant factors. At an educational level, the context of studio projects (part of the project theme) has a crucial role to play as a didactic tool. During the first couple of years, it has a higher degree of abstraction – meaning that it functions as a controlled medium with pre-defined, cohesive, non-restrictive characteristics. As the students amass theoretical knowledge in a wide array of subjects via coursework, and complementary, practice-based knowledge regarding urban planning, structures and architectural technology, the context evolves towards the complexity of real-life situations. While it stands to reason that the activities of design studio, theoretical disciplines and complementary projects should constantly inform each other, the pace and volume of this knowledge transfer can be difficult to adjust. Too many parallel courses and projects can lead to an unmanageable workload for the students. Too little – or too late - and their education will be riddled with information gaps and destabilized by underdeveloped skills. The relationship between these three educational aspects is vital to the efficacy and success of any architecture school, regardless of the model they follow – studio-based or polytechnic. In addition to relationship characteristics, special attention should also be given to the transfer of abstract and practical knowledge between these three components.

2. The IMUAU Curriculum

In Romania, an architecture student's education spans six years. The length and type of our architecture education system stems from a synthesis between classical architecture

education (dating back to 1892, when the school was founded) and the contemporary architecture education standards upheld and promoted by international organizations such as the UIA-UNESCO, EAAE, ACE, RIBA, and in schools across the world.

2.1. Structure

Comprising a licence – or B. Arch. – and an integrated Master's degree, the program is structured into two major design cycles: the Basics of architectural design (2nd and 3rd years of study) and the Synthesis of architectural design (years 4 and 5). In this configuration, the 1st and 6th years have a more atypical affiliation to the main cycles, meaning that they are subsumed to the Basics and the Synthesis structures, respectively, but are organized according to specific schemes, as befits the introductory and concluding years of the educational route. Thus, the 1st year makes up the Introduction to architectural design, while the 6th – the diploma year – calls on resources from across all faculties and departments, and is characterized by an interdisciplinary organization. The Faculty of Architecture consists of several specialized departments, each in charge of one aspect of architectural education: the design cycles are run by the *Introduction, Basics and Synthesis of design* departments, while theoretical courses and complementary projects are overseen by the *History & theory of architecture and Patrimony conservation, Technical sciences, Shape study and ambient, Interior design, Urban planning and regional development, Urban and landscape design.* Architectural education at the "Ion Mincu" University of Architecture and Urbanism is based on a design studio model of Beaux-Arts lineage (constantly updated to contemporary standards), with design studio hours and projects making up the bulk of the curriculum in both time and content. For a well-rounded program, design studio activities are complemented by theoretical courses (usually about 7 per semester), and speciality projects ranging from urban and landscape planning to architectural technologies and furniture design. In addition, about a third of all courses comprise both lectures and seminars, with the latter being a key component in linking theory with practice, since they mostly involve studio work and short projects meant to sediment theoretical notions through practical examples.

2.2. A design-centred education – relationships with the other disciplines

All three aspects of the curriculum – design studio, coursework and complementary projects are interconnected and interspersed across the six years of study according to a carefully developed educational strategy. The end result is a comprehensive architectural education attuned to contemporary values and requirements on all societal levels, adaptable to the fluctuations of the professional market, encouraging creativity and innovation but also anchored in local identity and sensitive to the specificities of our traditions, conscientious of environmental problems and dedicated to their resolution, and up to date and involved in the swift evolution of information technologies, building technologies and materials.

In the studio-based educational model, the knowledge imparted through theoretical disciplines and speciality projects comes to supplement that gained through the practice of architecture during studio hours, under tutor supervision. Even though they feature in the curriculum in different ratios, coursework, complementary projects and the design studio are to architectural education what voussoirs, mortar and scaffolding are to an arch. Without the frame of the scaffolding – generating structure and order – the voussoirs are simply disparate elements, and the scaffolding alone is only the unsubstantiated prefiguration of an intended object. The mortar adds strength, and binds disparate elements into one cohesive shape. In a nutshell, the relationships between these three elements are co-dependent and co-determinant. If the design studio can no longer supply a complete architecture education, as it once did, coursework and side projects provide the missing knowledge and experience which are, in turn, structured and integrated during studio hours in order to progress to the next level.

The figure above is an overview of design studio activities at IMUAU, structured according to cycles and years of study, and including general design modules and themes. To the left and right of the studio projects column are the theoretical courses and complementary projects which directly inform studio activities. Apart from the studio projects column, the table is not exhaustive. Naturally, all the courses featured in the curriculum are an integral part of a future architect's education, but I have selected those with a bigger role to play in the development of design competencies.

Looking at the table, there is an obvious counterbalance between courses and complementary projects. During the Basics cycle, the focus in on coursework, with up to 5-6 courses bringing crucial knowledge to design activities during a single semester, especially during the second semesters of years 2 and 3. At this time, there are no complementary projects other than practical exercises tailored to expand the focus of the design studio and stimulate in students certain design abilities necessary for progression to the next year of study. During the Synthesis cycle, there is a gradual decrease in immediately applicable coursework, and a marked increase in speciality projects (urban planning, structures, architectural technology, restoration, etc.), all integrated into the main frame of the studio projects. For example, the sports hall project (1st semester of the 5th year) entails a detailed urban plan during the first phase, and detailing regarding architectural technologies (advanced structures, materials, HVAC, etc.) during the second. Indispensable abstract knowledge – which could not be imparted during design studio hours due to time constraints and extreme specialization in the field of architecture – is contributed, during the same semester, by the *Advanced structures* and *Complex design* courses. The Synthesis cycle is also characterized by a decrease in courses requiring seminar work. In general, the students are experienced enough during their 4th and 5th years, and have developed sufficient analytical, critical and synthesis skills to integrate knowledge gained during courses in their design work. The time thus saved can be allotted

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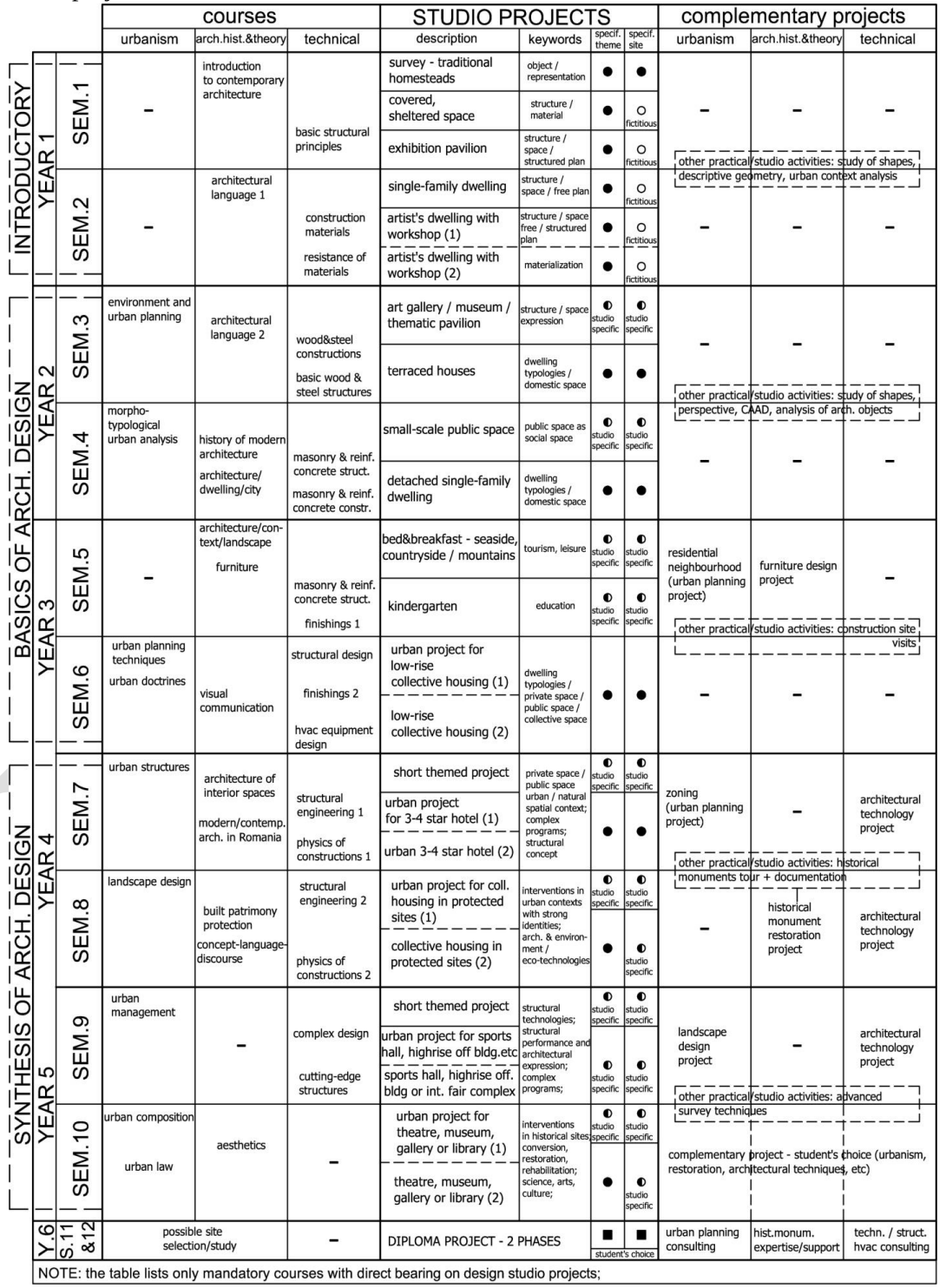
to increasingly complex speciality projects with themes connected to those of the main studio projects.



3. From Basics to Synthesis – the transition between educational cycles

The two cycles are different in structure, goals and scope, and one of the most delicate operations in updating the curriculum is ensuring a smooth transition from one cycle to the next. If the content and requirements become more complex from one cycle to the next, their structure remains the same: studio projects (between 1-3 per semester), sketch projects and practical exercises.

3.1. Evolution of context and content

As previously mentioned, the introductory year is a prelude to the *Basics of architectural design*, and familiarizes students with the basic elements of architecture – shapes, materials, textures, volumes, spaces, functions – and the language of architectural representation. During this time, the context of studio projects is a rather abstract, controlled medium, whose pre-defined, cohesive and non-restrictive characteristics allow students to manipulate shapes and spaces with as much unhindered creativity as possible. Years 2 and 3 of the *Basics of architectural design* cycle introduce real sites and contexts with a balanced blend of natural, urban, cultural and socio-economic requirements. In addition, the design goals extend to a comprehensive approach to architecture as a complex art form, mediating between the conceptual / artistic and the functional, working within the logic of a compositional system.

The 4th and 5th years of the *Synthesis of architectural design* cycle represent the final formative years preceding the 6th year diploma project. In preparation for real life practice, this cycle is focused on complex design grounded in extensive knowledge of the cultural, social, economic, managerial and technical aspects of architecture. Project sites and themes are not only real, but also moderately to highly problematic, requiring students to apply the aforementioned knowledge in a comprehensive, synthetic approach to design. The Synthesis cycle strives to simulate real practice conditions as closely as possible, addressing complex architectural programs (sports halls, high-rise office buildings, theatres, museums, etc.) and providing a multi-disciplinary tutoring team to guide students through all stages from urban and architectural concept to feasible detail design and choice of finishings.

3.2. Knowledge transfer and integrated design

Naturally, the progression from the Basics to the Synthesis cycle depends on the quality (and quantity) of the theoretical knowledge amassed and structured via coursework, and on the ability of complementary projects to address the knowledge gaps between coursework and studio by integrating the two types of knowledge: abstract and practical. As illustrated by the table presented above, there are three main areas of expertise which must complement practical knowledge: urban studies, history and theory of architecture, and

technical sciences. It should be noted that knowledge transfers in this system are by no means unidirectional; while a higher (and more diverse) quantity of knowledge issued from courses infuses design activities, the influx of knowledge on the same subjects acquired during studio critiques is by no means negligible, although oftentimes unsystematic. During the first three years, integration of the two types of knowledge often happens in the design studio, where the student's attempts to do so are overseen, encouraged and, where necessary, corrected by the tutor. By their 4th and 5th years, having developed the necessary critical skills to complement their practical training with theoretical knowledge, the students are guided only in applying enough of this compound knowledge in particular areas of their design work. At this stage, *integrated design* is the main goal: projects unite compulsory, interconnected components from many aspects of urban and architectural design (urban planning, historical studies, structures, HVAC, finishings, etc.) in one complex design process. These components are, in fact, the mandatory speciality projects previously described, and their direct application within unfolding studio projects has proved beneficial to the education process at IMUAU.

4. Excessive workload vs. incomplete education – a delicate balance

Some of the often neglected difficulties of this educational strategy lie in balancing the students' workload and the rigours of a complete architectural education. Given that studio activities alone take up around 50% of the total number of permissible study hours, an excess of parallel courses and complementary projects could prove unmanageable, to the detriment of the students' health and enjoyment of their undergraduate education. A deficit of theoretical courses – or an unsound placement in the curriculum – can lead to information gaps and even underdeveloped skills. Much like other artistic and unformulaic disciplines, architecture education is time consuming. After the long hours spent at school, the students must continue their work at home in order to achieve the best results. Poorly scheduled, design work requirements and seminar requirements from theoretical disciplines vie for the same timeslots in the students' very busy day, and the quality of the work is bound to suffer. A better integration of speciality projects into core design studio projects is a step in the right direction, but the situation could be further improved by doing the same with some of the seminars as early as the 2nd year of study.

5. Conclusions - in search of the optimum ratio between design studio, coursework and speciality projects

In conclusion, the key to finding an optimum ration between these three aspects of architectural education is *integration.* All three are equally important, but it obvious that, in a school applying the studio model – and giving precedence to apprenticeship of the profession by simulating practice – an equal ratio between these elements is detrimental.

This problem can be solved through a careful selection of relevant coursework, their distribution at key points of the main design studio curriculum, and connecting the two with complementary projects.

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