

Foundation Studio: Introduction to architectural design based on the student entrance profile

Taller de Fundación: Introducción al taller de diseño a partir del perfil de ingreso del estudiante

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Resumen

In certain socioeconomic circumstances it is necessary to design learning methodologies based on the analysis of the student entrance profile. In the case of the Universidad San Sebastián introductory architectural design class, Foundation Studio, this study has made it possible to design a course that structures learning through a series of activities that progress in difficulty. Initially, simple concepts are developed through short, guided exercises that are very limited both in terms of material, as well as the handling and format variables. The complexity of the problems increases progressively until end the year when students complete a basic architectural exercise with a reduced programme and minimal material exploration that emphasizes spatial articulation and material handling. Thus it becomes possible to even out the students' design abilities with a view to their progress in subsequent years.

Palabras clave

entrance profile, design studio, socioeconomic context, introduction to architectural design

Abstract

En determinadas circunstancias socioeconómicas, es necesario diseñar metodologías de aprendizaje a partir del análisis del perfil de ingreso de los estudiantes. En el caso de la asignatura de introducción al diseño arquitectónico (Taller de Fundación) de la Universidad San Sebastián, este estudio permite diseñar un curso centrado en abordar el aprendizaje a partir de una serie de actividades de dificultad progresiva. Partiendo de conceptos muy sencillos, desarrollados en ejercicios cortos, guiados y muy restrictivos tanto en términos de material, como de variables de manipulación y formato, se puede aumentar progresivamente la complejidad del problema hasta finalizar el año con un ejercicio arquitectónico básico de programa reducido y exploración material mínima, en el que se haga énfasis en la articulación espacial y la manipulación material. De este modo, se hace posible nivelar las competencias de diseño de los estudiantes de cara a su avance en cursos superiores.

Keywords

perfil de ingreso, taller de diseño, contexto socioeconómico, introducción al diseño arquitectónico

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[Fig. 1] The workspace of the Foundation Studio. Credits: Taller de Fundación 2016.



Introduction

The entrance characteristics of students who attend university in Chile have a series of distinctive features and imbalances that should be carefully considered when tackling tertiary education, and especially, training in architecture. Chilean educational policy suffers from a high degree of inequality that is notoriously evident in university access. As a result, the students who enter higher education have substantial differences in their formal education that should be addressed in the first year of study (Carreño, 2016).¹

Conscious of this situation, Universidad San Sebastián (USS), founded in 1989, declares in its Institutional Educational Project that “respect for the student and his or her way of learning” is the first guiding principle in the training process. This translates into the design, implementation and assessment of the teaching and learning process beginning with knowledge of the students’ entrance characteristics and adapting teaching strategies and resources to them.²

Taller de Fundación or Foundation Studio is a theoretical-practical subject that initiates students into the process of architectural design. The syllabus consists of six thematic units in which observation, abstraction, experimentation, creation and exploration of shapes become the basis of learning. The year-long class is taught during the first two semesters of the architecture degree program over 36 weeks and has a corresponding academic load of 24 Chilean SCT credits (equivalent to 24 European ECTS credits). Face-to-face classes are held two days a week, four hours each day (288 hours a year) and include both theoretical and classwork sessions, together with workshop revision. Additionally, it is estimated that students carry out 432 hours of independent work annually. Class size is limited to a maximum of 30 students, guided by an associate professor and a teaching assistant. Two groups of students and their professors work together by sharing methodology, exercise prompts, planning, assessment criteria and workspace.

Knowledge of the Students

The development of this introduction to design studio methodology based on appropriate knowledge of student entry characteristics began in the year 2014 and continues to the present, and has incorporated changes and improvements resulting from experience. During admissions, students are characterized based on

1 Carreño, Beatriz, Sonia Micin, and Sergio Urzua. 2016. “Una caracterización inicial para el logro académico de estudiantes de primer año universitario”, in *Cuadernos de Investigación Educativa* vol. 7, no 1 (June 2016), 29-39.

2 Vicerrectoría Académica USS. 2015. *Universidad San Sebastián Proyecto Educativo*. Santiago de Chile: Ediciones Universidad San Sebastián).

their *Prueba de Selección Universitaria* (PSU) or Chilean university admissions test scores. The minimum PSU score to enter the architecture degree program at USS between 2014 and 2017 was 450 out of 850, and the average for new students was 522. After enrolment, students take the *Instrumento de Caracterización Académica Inicial* or Initial Academic Characterization Instrument (ICAI), developed by the *Instituto de Rendimiento y Apoyo al Estudiante* or Institute for Student Achievement and Support (CREAR-USS), which supplies information about the students' entrance profile and can be used to take appropriate actions.³

The 2014 ICAI report on the School of Architecture was used as a starting point. It provided information on the different areas related to the process of academic adaptation, including: a socio-demographic analysis, a study of cognitive abilities and lastly, an evaluation of students' use of learning and study strategies. The socio-demographic study showed that 45% of students are the first generation of their family to gain access to higher education, 11% work during the academic year and 29% have changed residence in the last year –all variables that can hinder academic adaptation. Regarding the characteristics of the students' secondary educational establishments, 71% were private subsidized, 24% public, and only 5% private institutions.

The *Test de Aptitudes Mentales Primarias* or Primary Abilities Test (Test PMA), which is included in the ICAI, provides information on the cognitive abilities developed in prior socio-educational contexts (family-school). The architecture students present low indices of verbal skills (below the 40th percentile), as well as in numeracy skills and logical reasoning compared with the entire population of USS first-year students. Therefore, it is suggested that opportunities be provided to improve these abilities. With respect to spatial reasoning, the percentage of low-level students is less than 30%. Hence, it appears this area has potential for the School and can be used as a platform for development in the teaching-learning process.

Also included in the ICAI is the *Caracterización de Estrategias de Estudio y Aprendizaje* or *Characterization of Learning and Study Strategies* instrument (CEEA). With regard to the characterization of study and learning strategies related to the components of strategic learning⁴ (ability, will, and self-regulation), more than 30% of the students show low levels in all of the aspects evaluated (attitude, motivation, time management, anxiety, concentration, information processing, selection of main ideas, study aids, self-evaluation and exam preparation). These data have not experienced significant changes in subsequent years. As this report is prepared annually at the beginning of the academic year, it is a tool that enables changes to and improvements in methodology, planning and evaluation throughout the year.

Similar Initiatives

Foundation Studio can be compared with experiences in architecture schools in other countries with partially equivalent objectives. One example is the class *Curs d'introducció a l'arquitectura*, which has been taught since 1994 at the Vallès School of Architecture (ETSAV), Polytechnic University of Catalonia to facilitate the entry of new students. It is taken as a zero quadrimester before starting the subjects in the plan of study and counts towards elective credits. One of the strategies of this class is “to encourage the learning of other arts and also learning outside the classroom”, in addition to attempting to instill an enthusiasm for the study of architecture.⁵ An interesting result of this introductory class, according to the junior professor Ferran Martori, is that it establishes a “cohesive” human group. Both Foundation Studio and *Curs d'introducció* employ the learning strategies of designing short exercises, and above all, the planned, gradual increase in the complexity of the assignments as the class progresses.

3 Carreño, “Una caracterización...”.

4 Ibid.

5 Ferran Martori, 2012. “El Curs d'introducció 2011 ETSAV | Una experiència diferent dins la universitat”, *Hicarquitectura*, February 27, 2012 (accessed March 7, 2019).

Alternately, one of the classes that most inspires Foundation Studio conceptually, beginning with its name, is the Architectural Association School of Architecture's (AA) Foundation Course in London. An introduction to both design and art, Foundation Course is a one-year-long immersion that brings into play a wide range of media and approaches with the goal of discovering, inspiring and exciting.⁶

Foundation's interdisciplinary spirit is reflected in the course's teaching staff, which is comprised of three architects and an artist. Of the four professors, two have professional architectural offices, one specialises in architectural theory and history, and the artist contributes his or her knowledge in terms of exhibition. Foundation Studio has a similar scheme, given that there are three architects (two with active practices), complemented by a visual arts professor (painter). While Foundation Studio is an introductory class in architecture, the presence of an artist as a professor makes it possible to open discussions on complementary topics such as visual discourse, composition, the interaction of color, sensory-oriented approaches to materials, or exhibition techniques, among others.

Some of the knowledge covered in Foundation Course is also incorporated into Foundation Studio, although it is important to remember that the AA class is focused on student self-discovery in order to carry out future studies in an arts-related field, including architecture. This shared knowledge is related to: understanding the concordance between observation, analysis and representation to articulate an assignment; the intensive production of objects made of different materials to explore the three dimensions; the use of photography to both record the process and for the final work (practicing composition and lighting), and to understand space through photomontages and collages; the references to the history and theory of the ideas that inform contemporary practice; the development of a dossier that illustrates and documents the experience of the design process; and also the importance of the appropriate exhibition of the work, which enhances it. Another point in common with Foundation Course is the organization of brief intensive workshops during the class to develop certain skills. These workshops include photography, illustration, materials techniques or binding.

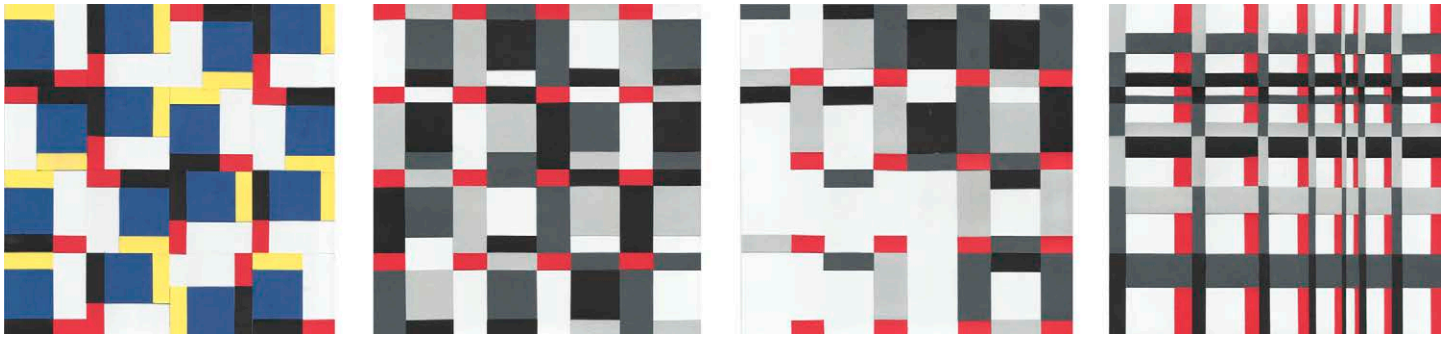
The fundamental difference between Foundation Studio and the two previously mentioned courses is that the former is a compulsory subject in the plan of study, while students elect to take the ETSAV and AA courses. Furthermore, the spirit of the multi-dimensional character of Foundation Studio, which crosses content with other classes in the first year of the degree program, aims to motivate students in the field of architecture.

Building a Methodology

Foundation Studio takes on the challenge of initiating the students into the architecture discipline. On one hand, the class design responds to the information collected with the Initial Academic Characterization Instrument, and on the other, the strategies recognized in the experiences of other schools of architecture presented in the previous section. As previously mentioned, the ICAI includes data from the CEEA and the Test PMA. Regarding the relevant experiences in other institutions, Foundation Studio adopts the short exercise and gradual introduction of topics strategies from the *Curs d'introducció* and the ideas contributed by the AA's Foundation Course related to experimentation, material manipulation, the value of intuition, the importance of doing, documentation and representation.

Consequently, starting with the data and the aforementioned strategies, a general strategy was created for the studio methodology based on a series of concatenated exercises that little-by-little increase in the number of variables to be considered.

6 See the webs of Foundation Course Architectural Association and Foundation Course Booklet 2018-19.



[Fig. 2] Two-dimensional Modular Compositions. Credits: Taller de Fundación 2016.

Hence, the class begins with very simple concepts, put into practice in short, guided assignments that are very limited in terms of material, variables and format. The complexity of the problems increases progressively to the end of the year, which culminates with a basic architectural exercise with a reduced programme and minimal exploration of materials that emphasises spatial articulation and materials manipulation.

With the aim of giving shape to this methodology, specific strategies were established that can be arranged into two groups: those that directly correspond to the planning and design of the exercises (cognitive skills), and those that have an impact on the approach to the dynamics and the development of the studio sessions (learning and study strategies). Below, some of the exercises, actions and methodological strategies that shape the studio in response to the student entrance profile are presented.

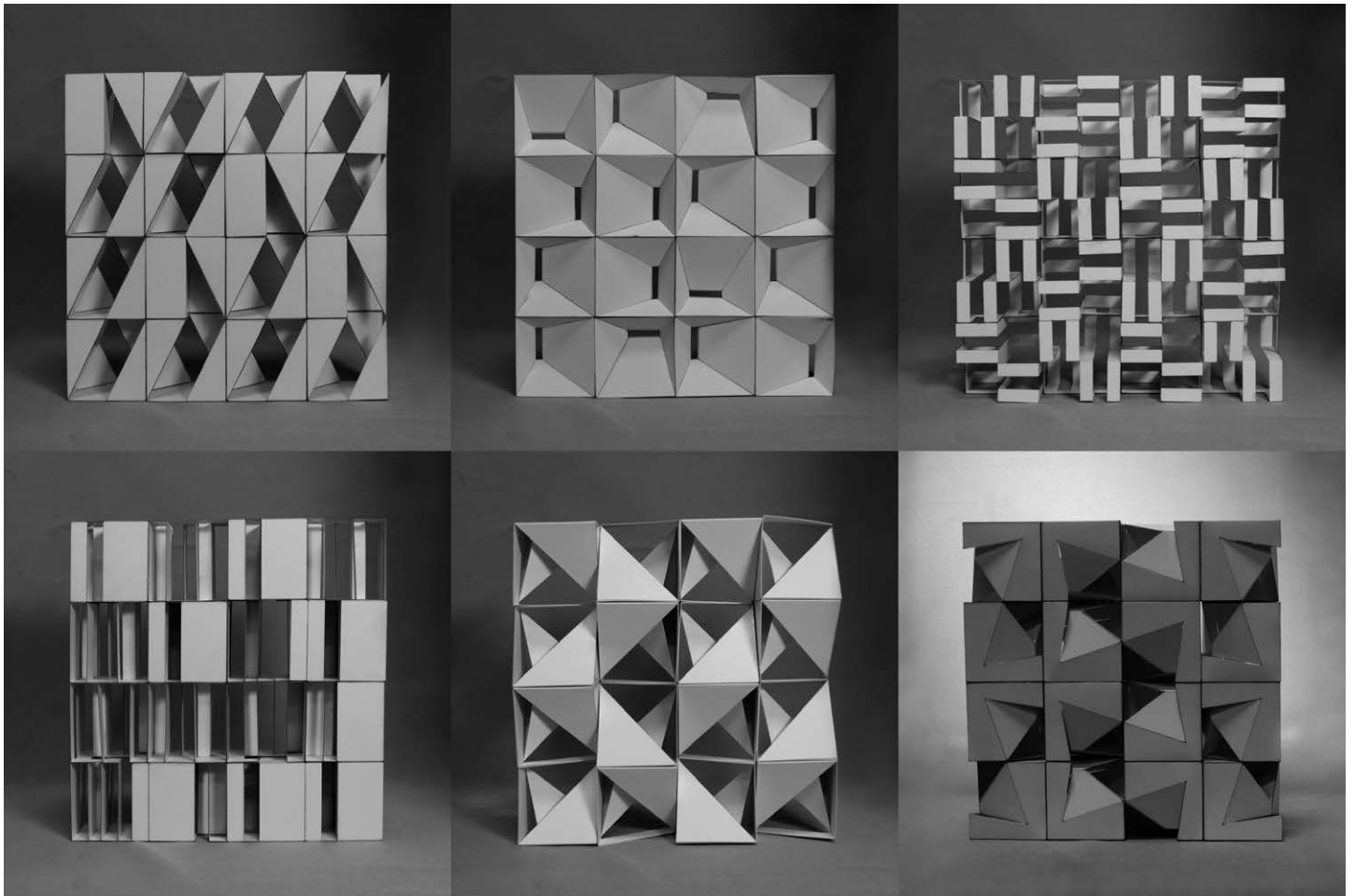
Exercise Design

The goal of the exercises is for students to achieve specific learning outcomes declared in the class syllabus. Their design and planning, over six units that comprise the academic year, recognise the weaknesses found by the Test PMA in the ICAI in relation to verbal skills, logical reasoning and spatial reasoning. These factors associated with cognitive skills determine the scope of the exercises and the methodological strategies that are described below.

The starting point for the first semester is the concept of concrete design, understood as “a kind of creation that develops from its own means and laws without having to borrow or derive these from external natural phenomena”.⁷ Foundation Studio appropriates this formula and explores it with exercises designed to pursue specific composition objectives through defined rules and a minimum number of design elements. This makes it possible to achieve various results through a limited number of combinations and iterations. During the development of these exercises other concepts or variables common to art, design and architecture are added, such as order, structure, elements of visual language, and proportion, which each student puts into practice throughout his or her creative process.

Initially, the students tackle the exercises intuitively by manipulating the material, which depending on the unit may be paper, cardboard or wood. Once they have developed a preliminary composition, students are asked to carry out an analysis using diagrams and drawings that enable them to formalise the strategies and laws implicit in their work, thereby stimulating and reinforcing logical reasoning. That is to say, first they create the object and subsequently in a process of reasoning they analyse and represent it using different means. An example of the above is the modular composition exercises that begin with formal and material constraints and result in a series of two- and three-dimensional objects based

7 Max Bill, 2004. “Diseño concreto”, *Revista Internacional de Arquitectura* 2G 29-30: 255.



[Fig. 3] Three-dimensional Modular Compositions. Credits: Taller de Fundación 2017.

on the exploration of the possible combinations of a unit. Here the students are given the dimensions of the basic unit, which changes as the exercises progress, beginning with a flat surface (a square module), then a module inscribed in a cube, and finally, a three-dimensional module composed of solid wood pieces. Based on the geometrical and material laws of said units, students must design a module capable of generating a greater composition by means such as translation, rotation, variation, and symmetry. The result of the exercise is to recognise in both the definition of the module and in the final composition, the properties of the material and the application of specific laws that give the object a clear order and language.

In the second semester, the one and only exercise uses the last assignment from the previous semester as its starting point. Thus students are obliged to study prior work, which is analysed using photographs, diagrams and basic plans, with the aim of discovering their compositional, spatial and constructive logics. These tools help the students first of all to understand their work so that in the next stage they can develop a project that responds to new conditions: scale, site, atmosphere, path, use and context. In order to contribute to the student's logical reasoning, the gradual incorporation of these concepts is crucial. For this reason, the exercise consists of three stages that can be identified as the project (initial spatial proposal), the place and the scale, and the final development (materialisation, representation, and exhibition).

Foundation Studio embraces Peter Zumthor's (1996) reflection regarding the importance of material in the first year of teaching and learning architecture: "There are no cardboard models. Actually, no 'models' at all in the conventional sense, but concrete objects, three-dimensional works on a specific scale".⁸ Therefore the project explores the spatial articulations and the paths through solid experimental models, that are then formalised in wood or plaster. The development of these

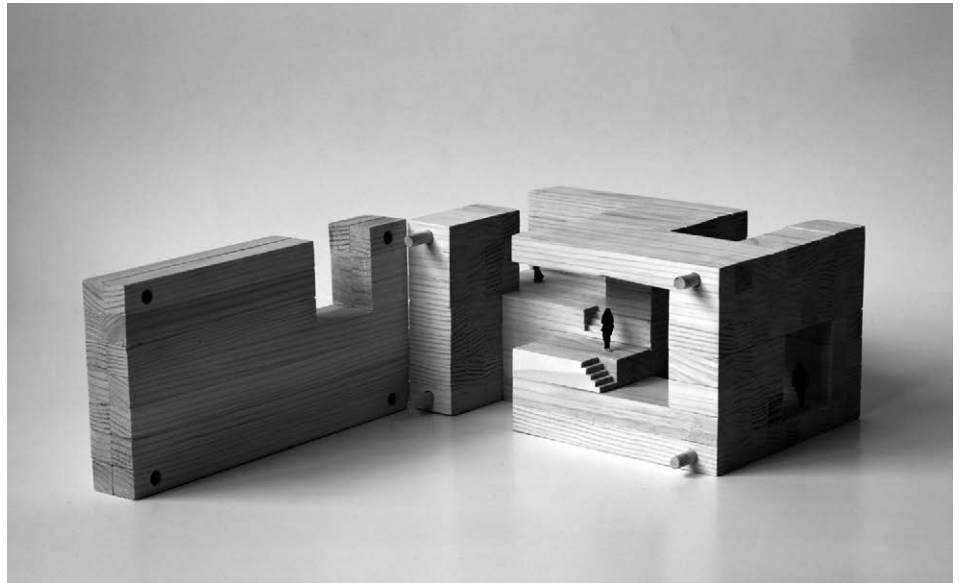
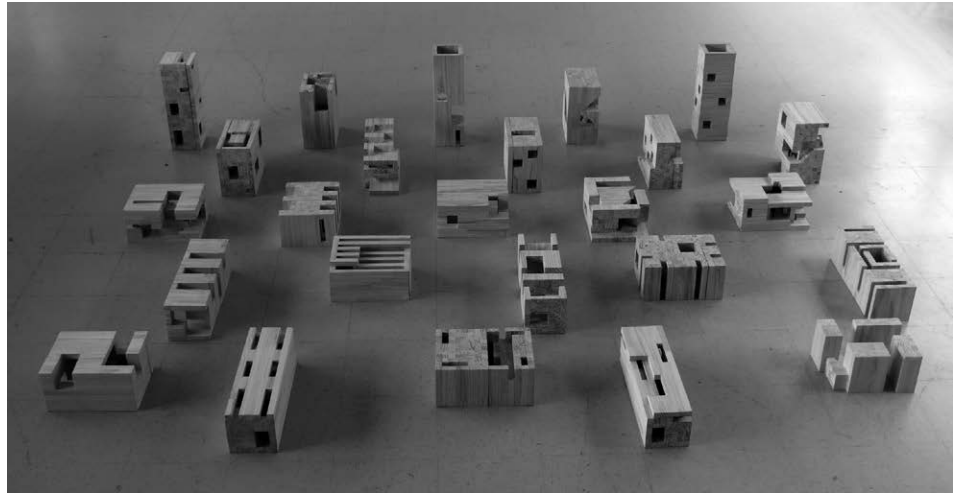
8 Peter Zumthor, 2006. *Thinking Architecture* [Second, expanded edition] Basel: Birkhäuser, 66.

El aprendizaje
de la arquitectura
The learning
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[Fig. 4] Basic architectural exercises. Credits: Taller de Fundación 2017.

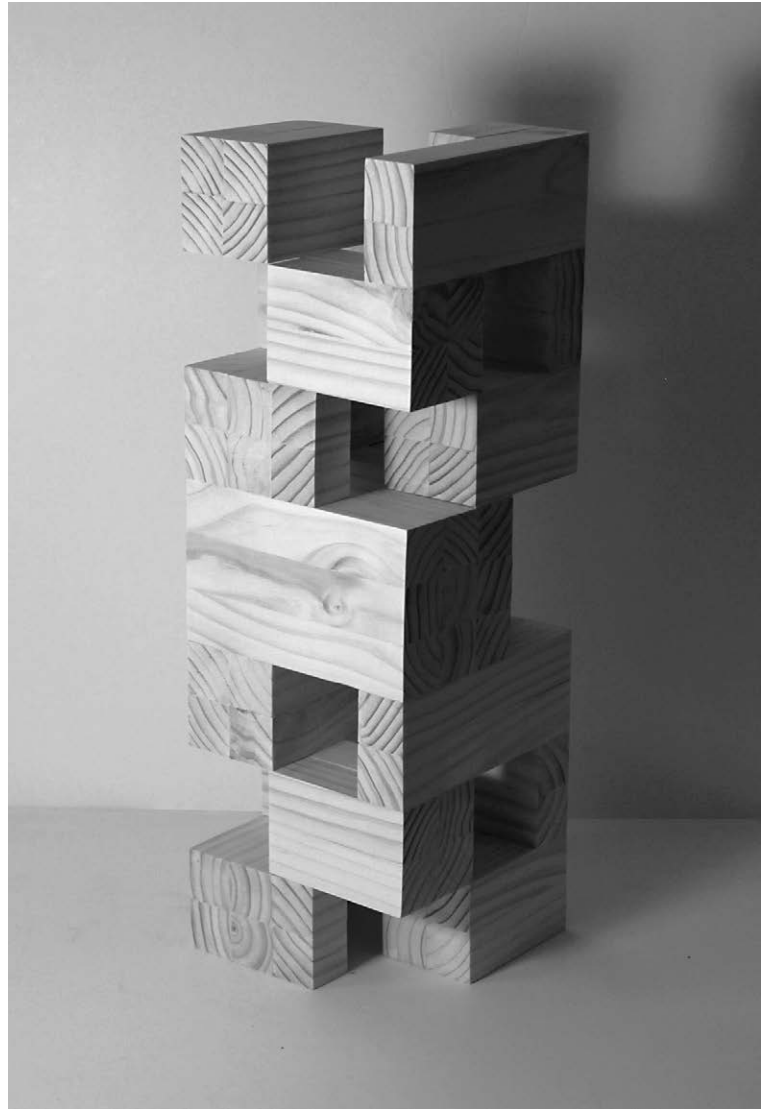
[Fig. 5] Basic architectural exercise. Credits: Taller de Fundación 2017.

models implies a close relationship with the material, which makes it possible to explore its properties (feel, weight, texture, and structural capacity, among others), once again by means of its manipulation. It is in this handling that the student exercises his or her spatial reasoning to attempt to configure spaces using compositional laws and constructive logics that arise from the material itself, always in response to prior spatial analysis.

To delve deeper into the materials dimension, the School has a Manufacturing Workshop equipped with analogue and digital tools, which enable the student to interact directly with the different materials that are used throughout the academic year. All exercises are designed and each material is chosen according to the opportunities the Manufacturing Workshop provides for their handling and the subsequent execution of the objects to be built, for example, the use of laser cutting for the mass production of spatial modules made of corrugated cardboard and the use of analogue cutting and sanding tools to build wooden objects. These facilities aid in the neatness and execution of the work. The quality of the finishing of the material is a key factor that contributes to the proper reading of the intentions, logic and laws deposited by students in the different objects they build.

In synthesis, the objectives of the exercises establish a clear progression that leads the student from planes to volumes and the understanding of different spatial articulation systems. Initially, the exercises explore two-dimensionality in order to, based on this experience, extract strategies and methods that enable students to work on three-dimensional compositions and create their first spatial

[Fig. 6] Modular Composition in Wood. Credits: Taller de Fundación 2017.



configurations. Through these exercises it is possible to stimulate and consolidate the student's basic spatial reasoning, which constitutes a fundamental aspect of addressing architectural problems that are introduced in later courses. Finally, it is important to mention that students' oral expression is developed and evaluated transversely in all exercises throughout the academic year.

Work in Foundation Studio

Next, the methodologies and procedural resources aimed at strengthening learning and study strategies during the studio sessions will be presented. Their further goal is to support and consolidate the principle of learning by doing. These strategies are directly targeted at the three aspects evaluated in the CEEA: time management, information processing, and self-evaluation.

In relation to time management, studio dynamics are established that depend on limited assignments with classwork and continuous assessment. In these practical exercises the task is explained and students work in the studio with the professor's support. This enables the student to progress with a guide, ask questions, take advantage of the course's practicum hours and schedule him or herself according to one's abilities. The exercises are completed outside the studio and are presented and assessed in the following session. All of the exercises set out in class are part of the process that culminates in the final submission of the unit.

Regarding information processing, three strategies are employed. In the first, the concepts and content involved in each exercise are studied in theoretical classes,

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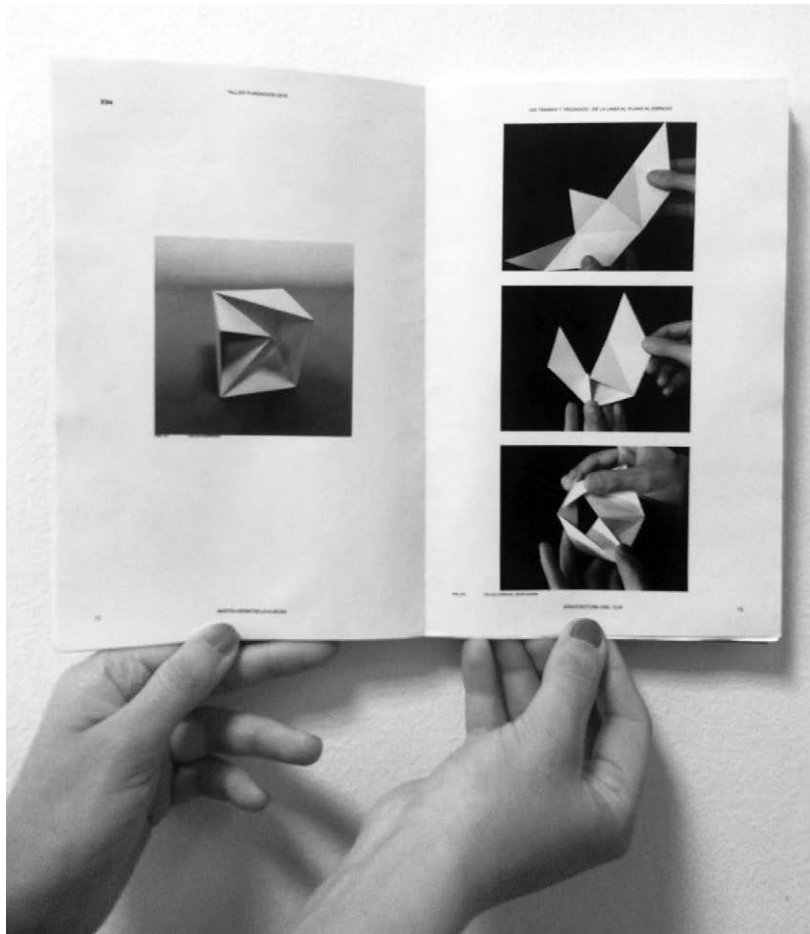
[Fig. 7] Group Conversation. Credits: Taller de Fundación 2016.

which are complemented with the analysis of relevant cases and references. Afterwards during the studio sessions, the students apply that knowledge in practice by experimenting and manipulating the established materials. This is in line with the learning by doing pedagogy, in which trial and error are a fundamental part of the learning process. Lastly, blended sessions are held in which both the achieved and unachieved results of the day are presented and conclusions are explained that enable the further development of the proposals.

The second strategy consists in introducing different knowledge and technical skills required to carry out the exercises. This is achieved through specific thematic workshops such as: photography, materials handling techniques, drawing, illustration, collage and binding. There are three per semester, each has a duration of one workshop day and consists of intense work on assignments that must be presented at the end of the session. This generates a dynamic of information interchange among students and professors that enables the sharing of strategies, techniques and results obtained by trying different approaches to the same assignment.

The third strategy, which reinforces student information processing skills, is documentation. Each stage of the work process is continuously recorded, culminating in the creation of the student's graphic dossier. This document is a reflection and material testimony of the process that makes it possible for the student to reexamine what has been done in order to establish real relationships between that which has been learned and that which is new. This enables understanding of the logics and sequences of what has been done throughout the academic year.

Lastly, Foundation Studio is continuously supported by peer- and self-assessment. In the studio sessions, both the professor and the students take part in assessing classmates' work as well as their own. Likewise, upon finishing each unit there is a reflection and self-evaluation session. In addition, at the end of every semester



[Fig. 8] Graphic Dossier. Credits: Taller de Fundación 2016.

[Fig. 9] Different exercises of the course. Credits: Taller de Fundación 2016-2017.



external professionals and academics are invited to take part in final review commissions that provide an alternative vision of student work, complementary to that developed in the studio. Students must demonstrate their communication skills for the commission in the form of oral expression and graphic discourse, which contributes to developing critical judgment of their own work.

Consolidating the method and dissemination of work

The dossier produced while completing the workshop exercises is not exactly a portfolio, given that it lacks the critical reflection associated with this type of instrument. However, it does function as a systematic documentation tool that makes it possible to follow the processes and become aware of the various stages of work.

This process dossier should be properly organized according to the stages of the course from beginning to end in a preestablished half-letter-sized format. In one document it gathers all of the work done during the year in Foundation Studio, thereby acting as a valuable graphic testimony for both the course's teachers and the individual student.

The template for this document is given to students so they can focus solely on achieving quality photographs. A hard copy of the dossier is handed in at the end of each unit, and the complete version in digital and printed formats is turned in at the end of the course. Digital submission allows teachers to make later use of the best images to disseminate results.

One of Foundation Studio's motivational strategies is the dissemination and visibility of student work in different formats.⁹ Correspondingly, the course's final submission is associated with an exhibition outside the classroom in a highly-visible location in the city. The public display of knowledge is essential, as Ricardo Devesa

9 José Ángel Brunel, 2017. "¿Cómo iniciarse en la arquitectura? La experiencia del 'Taller de Fundación USS' en Concepción", Plataforma Arquitectura, June 21, 2017, <https://www.plataformaarquitectura.cl/cl/873878/como-iniciarse-en-la-arquitectura-la-experiencia-del-taller-de-fundacion-uss-en-concepcion> (accessed September 14, 2018).

indicates,¹⁰ to improve students' critical judgment and raise their awareness of what they have learned.

In 2016, an Instagram account was created for Foundation Studio that periodically publishes images of the day-to-day environment of the course and the most outstanding work, thus contributing to the motivation to study architecture. This account also gives the studio visibility, and is in line with the profile of current students who are digital natives. Additionally, the Instagram account is a reference base for students and teachers, as well as a digital memory of the course.

Conclusions

Upon analysing the dropout data and passing rate for the course between 2015 and 2017, it was observed that although the number of students that do not meet attendance requirements is high, on average 23%, it is also evident that the percentage of students enrolled in the class that passes has progressively increased from 70 to 81%.

To conclude, in respond to weaknesses found in the student entrance profile, the Foundation Studio methodology employs several important strategies. Firstly, learning by doing and experimentation are highly important and trial and error are understood to be a fundamental part of the project process. Secondly, objects are built as the result of an intuitive process and subsequently analysed, understood and represented. Thirdly, spatial and material exploration are valued from an experimental, sensory-oriented, basic and essential perspective that is easy to understand for first-year students.

The pedagogical decisions made and resulting actions implemented in Foundation Studio aim to facilitate the student's adaptation to the university context, as well as academically level students in those areas in which they show low indices of cognitive abilities and learning strategies. Although these suppose an increase in student academic performance and the rates of attrition are lower than the national average in architecture, it would be opportune to continue working on these areas in the years following student entry into the program.¹¹ Furthermore, study of the student profile upon completion of the first year would make it possible to corroborate whether these strategies are effective and therefore can be extrapolated to other courses or degree programs.

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Note

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