

Lessons between apprentices. Vertical structure in the teaching of architecture

Lecciones entre aprendices.

La estructura vertical en las enseñanzas de arquitectura

LUISA ALARCÓN GONZÁLEZ

FRANCISCO MONTERO-FERNÁNDEZ

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Resumen

La enseñanza de proyectos arquitectónicos estructurada en talleres verticales, en los que alumnos de diferentes cursos comparten docencia ha sido una fórmula adoptada en diferentes escuelas y periodos históricos desde la Bauhaus en Alemania hasta la actualidad. Esta organización docente constituyó la estructura fundamental de la enseñanza de proyectos en la Escuela de Arquitectura de Sevilla desde el curso 1975-76 hasta el 1994-95. Este sistema generaba sinergias importantes entre profesores y alumnos, especialmente significativas entre los propios alumnos que aprendían no sólo del profesor sino también de los compañeros de niveles superiores, estableciéndose una estructura de aprendizaje similar a la de los talleres artesanales, facilitando la iniciación en una práctica nueva, como es la de la creación artística, mejorando el trabajo colaborativo y la relación intergeneracional.

Palabras clave

Taller, Vertical, Sevilla, Aprendices, Colaborativo

Abstract

The teaching of architectural projects structured in vertical workshops, in which students from different years have shared teaching, has been a formula adopted in different schools and historical periods, from the Bauhaus in Germany to the present time. This educational organisation constituted the fundamental structure of the teaching of projects in the School of Architecture of Seville from the 1975-76 to the 1994-95 academic year. This system generated important synergies between teachers and students, especially significant between the students themselves who learned not only from the teacher, but also from their higher level classmates, establishing a learning structure similar to that of craft workshops, facilitating the initiation into a new practice, such as that of artistic creation, improving collaborative work and intergenerational relations.

Keywords

Workshop, Vertical, Seville, Apprentices, Collaborative

Luisa Alarcón González. She is MA in Architecture (1992) and PhD in Architectural Projects (2015), both at the University of Seville. She is Associate Lecturer in Architectural Projects since 2009 at the University of Seville. He has published in research journal such as PPA, *Civiltá Romana*, *Habitat y Sociedad* and *RA revista de arquitectura* and chapter books in editorials like *Recolectores Urbanos*. lalarcon@us.es

Francisco Montero-Fernández. He is MA in Architecture (1987) and PhD (1995) both at University of Seville, a former holder of fellowships from Academy of Spain in Rome in 1992-93. He is Professor in Architectural Projects since 1997, Lecturer in Analysis of Architectural Forms (1987-1995) and Architectural Projects since 1995 from the University of Seville. He teaches in PhD and Master since 1995, from I.U.A.C.C (1996-2000) and from Architectural Projects Department (2000-2012). He coordinates research area named "Housing and Contemporary Habitat" in the doctoral program at the University of Seville. He is member of editorial board of the reviews *Proyecto*, *Progreso y Arquitectura* at the University of Seville and *Boletín de Arte* at the University of Malaga. He has published in research journal such as *Edilizia Popolare*, *Boletín de Arte*, *Neutra*, *PPA*, *Civiltá Romana*, *Habitat y Sociedad*, *RA revista de arquitectura* and *EGA* and books and chapter books in editorials like *Visor*, *Recolectores Urbanos*, *Green Lines Institute for Sustainable Development*, *Junta de Andalucía*, *Universidad de Navarra* and *Universidad de Sevilla*. fmontero@us.es



[Fig. 1] Students of Gropius in the Bauhaus of Dessau, L C S Skanderbegh, 1928.
Source: The Bauhaus Archive.

Introduction

When we were children we learned not only from our parents, but also from our siblings with a different form of learning, one with more complicity. We felt a certain admiration for our older siblings, accompanied by the aspiration to reach their increasing degrees of autonomy, knowledge or responsibility, such as going to school instead of the nursery, beginning a sport as yet impossible because of our age, or the reading of some prohibited book. It is a learning between equals, or almost equals, very different from that which is obtained from a person who exerts authority, who is on a higher plane. The parent and the teacher are figures we felt to be distant, who taught us by setting rules from a plane different to ours.

This structure of transmission of knowledge with intermediate stages is also reproduced in other spheres, generally offering advantages. The trade and craft workshops have usually had apprentices, as a form of initiation into some trades, whose techniques of production pass from one to another through the emulation of the experienced professional. There is generally a hierarchy, there is a boss or teacher, and a series of people structured by their years of experience or attained capabilities. The novice normally learns, as much from the teacher as from other apprentices, the tricks of the trade to be able to get along in that world, as Richard Sennet indicates:

“In craftsmanship there must be a superior who sets standards and who trains. In the workshop, inequalities of skill and experience become face-to-face issues. The successful workshop will establish legitimate authority in the flesh, not in rights and duties set down on paper”.¹

1 Richard Sennet, *El Artesano* (Barcelona: Anagrama, 2009), 73-74.

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[Fig. 2] Discussion on works presented in the preliminary class of Josef Albers in Dessau. Otto Umber, 1928-1929. Source: The Josef and Anni Albers Foundation.

The Architectural Workshop: The Bauhaus and the VKhUTEMAS

The workshop, as a place of learning in the teaching of architecture, appears at the beginning of the 20th century in Vienna, with the so-called “Wiener Werkstätte”. They were founded in 1903 by Josef Hoffmann and Kolo Moser, within the Technical School of Architecture, which had been a specialist division independent from that of Arts and Crafts since 1868. In these “Viennese Workshops”, the teaching of projects was given a practical base instead of the traditional copying of models, and included the principles of the artistic avant-garde of the time, in the search for a new architecture removed from the prevailing historicism. This new approach understood that to achieve its objectives teaching also had to change because the academic system, instilled from the Fine Arts Academies, only taught the copying of old models, as Julio Vidaurre reflects in his definition of the teaching of architecture in Spain at the beginning of the 20th century:

“The dominant didactic criteria continue to be the formal and the compositional; the ideological platforms from which the teaching of architecture stems, are those typical of all academicism: the imitation of consecrated contributions, with a revisionist eclecticism as the only creative alternative; and a scale of values which give preeminent place to the ‘plastics’, typical of the Fine Arts: balance, symmetry, proportion, [...] as fundamental premises for judging the obtained results”.²

From that moment, in the teaching of architecture, the word Workshop began to be thought of as an element of change, of revolution, of transformation of the prevailing. Thus, the two most paradigmatic examples in the schools of art and architecture at the beginning of the 20th century, the Bauhaus³ in Germany, and the VKhUTEMAS⁴ in the U.S.S.R., use them as the structure of their pedagogical methodology. Although the teaching of architecture does not appear, as such, in the Bauhaus until 1927, Walter Gropius, in his founding manifesto of 1919, defined among its principles the indissoluble link between all the arts and the importance of the Workshop as a key place to learn, in the manner of craftsmen, through practice:

“The ultimate aim of all visual arts is the complete building! [...] Architects, painters, and sculptors must recognise anew and learn to grasp the composite character of a building both as an entity and in its separate parts. Only then will their work be re-imbued with the architectonic spirit which it has lost as ‘salon art’. [...] The old schools of art were unable to produce this unity; how could they, since art cannot be taught. They must be merged once more with the workshop. [...] Architects, sculptors, painters, we all must return to the crafts! For art is not a ‘profession’. There is no essential difference between the artist and the craftsman. The artist is an exalted craftsman”.⁵

2 Julio Vidaurre Jofre, “Panorama histórica de la enseñanza de la arquitectura en España desde 1845 a 1971” in *Ideología y enseñanza de la arquitectura en la España Contemporánea*. Antonio Fernández Alba, com. (Madrid: Tucar ediciones, 1975), 46-47.

3 The Bauhaus was founded by Walter Gropius in 1919, in Weimar, as an academy of “free” and applied art, as a combination of the old art academies and the schools of arts and offices. In 1925, it moved to the city of Dessau and, in 1932, to Berlin where it finally closed on 20th July 1933. Walter Gropius was its Director from its foundation to 1928, being replaced by Hanner Meyer until 1930, in that year, and until its dissolution, it was directed by Mies van der Rohe.

4 VKhUTEMAS was the name given to the “Higher State Artistic and Technical Workshop”, founded in the U.S.S.R. in 1920, in 1927 it changed its name to Vkhutein and was finally dissolved in 1930.

5 Rainer Wick, *Pedagogía de la Bauhaus* (Madrid: Alianza, 2007), 33.



[Fig. 3] Students of Architecture in the workshop of Ladowski, VKhUTEMAS. Alexander Rodchenko, 1929.

Based on these principles, the teaching in the Bauhaus was structured into workshops where different disciplines were developed (printing, pottery, stone, metal, painting, carpentry, weaving, theatre, architecture), in which personal creativity, learned by means of practicals guided by a teacher, was promoted to generate novel designs adapted to the society of the time, fleeing from the copy or imitation of the historical elements that did not suitably respond to the technological development which was taking place. It was the desire to work and to innovate for society as a whole, not for an elite, an increasingly more attainable circumstance, due to the progressive increase of industrial production during the 19th century and the start of the 20th.

In parallel to the Bauhaus, in the recently created Soviet Socialist Republic, the Moscow Fine Arts Society, of which the School of Painting, Sculpture and Architecture was part, was abolished in 1919, and it was transformed into the “State Free Art Workshops”. As in Germany, the word chosen to refer to the new teaching of art that distanced it from academicism was “Workshop”. This choice was intended to mark the intentions to democratise education and bring about a fusion between pure and applied art, channelling this integration towards industrial production. The new institution was defined as: “a higher specialised artistic teaching establishment, with the objective of preparing teacher-workers, higher qualified artists for industry, as well as instructors and leaders for industrial technical training”.⁶

The new teaching method of the VKhUTEMAS sought to apply a scientific-technical method for the different disciplines that were taught, remote from the subjectivity of the artistic creation that permeated the old education in the Schools.

The Total Workshop and the vertical workshops. The experiences of the Seventies

The debate on the need for change in the teaching of Architecture was present throughout the 20th century, reaching pivotal moments when the social movements were stronger, as was seen in the Twenties, and, as occurred again in the Sixties and at the start of the Seventies. The social and political movements of these decades were contemporary with a crisis in the university educational model, which was especially significant in the Schools of Architecture.

6 Luis Carlos Colón Llamas, *Las vanguardias artísticas y la enseñanza en la Rusia de los años 20* (Valladolid: Universidad de Valladolid, Secretariado de Publicaciones e Intercambio Editorial, 2002), 127.

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[Fig. 4] Students of the FAU of the National University of Cordoba, (Argentina), 1972. Source: <<https://muchopalonoticias.com/2016/09/07/el-taller-total/>>

Teaching in many countries was transformed by experiences that sought to eliminate the prevailing rigid academic structure, bringing teachers and students together in the pursuit of a common goal. In Paris, the formation of the Unité Pédagogique d'Architecture N° 6 (UP6), in 1969, promoted an alternative to the teaching of the School of Fine Arts, while it reformulated the way in which architecture defined itself to confront contemporary social problems. In Italy, a group of teachers of architecture of the University of Florence formed Global Tools (1973-75), where they established a system of laboratories between Milan and Florence, at the margin of the institutions that sought alternative teaching in workshops and travel. The Ulm School (1953), Peter Eisenman's IAUS of New York (1967), or projects such as the Potteries Thinkbelt of Cedric Price (1965), are other examples of attempts to transform the teaching of architecture in the Sixties.⁷

In this climate of social and political revolution, the Faculty of Architecture and Urbanism of the National University of Cordoba (FAUC-Argentina) set out one of the most radical transformations in teaching that would modify the role of teachers and students, having sought, on the one hand, to achieve a greater social involvement of architecture and, on the other, a change of the educational model where the student, in response to these movements of hierarchical change, would leave the closed and stagnant classroom and be involved in a manner closer to society.

These intentions took shape in an experience that was termed *Taller Total* (Total Workshop), between the years 1970-76, and which also extended to other Faculties of the country, with some nuances, such as Rosario in 1971 and La Plata in 1974.⁸ The Curriculum of the FAUC defined the reason for the change thus: "Teachers and students have been driven to assume a process that leads to understanding Architecture as a social practice, interpreted in an interdisciplinary manner, assumed and resolved by the Architect, and where the USER is the recipient, continuator and communal caretaker of the product: the human habitat".⁹

The *Taller Total* represented a radical change in educational methodology, which, according to Malecki, "was the result of a series of institutional, political, social, and disciplinary crises that, in the context of post-Cordoban radicalisation, sought to put the social function of architecture at the centre of discussion by means of a redefinition of teaching methodologies",¹⁰ which affected from the division by subjects, that were transformed into areas of knowledge, to the teaching career and the teaching methodologies in which the student was considered a passive subject: "the traditional academic-messianic form, as a relationship between the active entity of the Teacher, and the passive and receptive entity of the student. This structure, lacking in ambitions and stimuli, is a fictitious system that leads teaching to the condition of mere 'ceremony'".¹¹

7 Beatriz Colomina and others: "Pedagogías Radicales: Reimaginando los protocolos disciplinares de la arquitectura", *Materia Arquitectura* #14 (2016) 37.

8 Juan Sebastián Malecki, "Crisis, radicalización y política en el Taller Total de Córdoba, 1970-75" *Prohistoria año XIX, number 25* (June 2016), 80.

9 Faculty of Architecture and Urbanism, *Taller Total. Plan de Estudios* (Córdoba: Universidad Nacional de Córdoba, (1971, reprinted in 1975)), 3-4.

10 Juan Sebastián Malecki, "Crisis, radicalización y política en el Taller Total de Córdoba, 1970-75" *Prohistoria año XIX, number 25* (June 2016), 81.

11 Faculty of Architecture and Urbanism, *Libro Mostaza* (Córdoba: Universidad Nacional de Córdoba, (1971), 6.



[Fig. 5] Students of *Taller Total 11* in Colonia Lola, Buenos Aires (Argentina), 1972. Source: https://blogs.unc.edu.ar/tallertotal/files/Pan- nel-03_TALLER-11-COLONIA-LOLA-Eduar- do-Lastra.pdf

The *Taller Total* sought a totally practical teaching, with a horizontal and vertical structure of the different areas of knowledge into which the curricular structure had been divided, eliminating the previous system of Chairs, and dividing the teaching into two blocks, the *Taller Básico*, also called Elements of Architecture, for the first year, and the *Taller Total*, for the other levels. In the FAUC, 12 Workshops or Work Teams functioned with this methodology, with disparate success.

Among the successful experiences was that of Studio 11, in a working-class suburb of Buenos Aires called “Colonia Lola”, where its deficiencies were analysed by students, teachers and the neighbours, and actual projects were prepared that were agreed with the future users. A unique teacher-student role was established in which team work created the knowledge, and working groups composed of students from all levels were implemented. The result was an educational success with the involvement of a great number of students, teachers and professionals of architecture, social and other disciplines, with the construction of a school in the district and the beginning of several improvement projects, all actively functioning until the arrival of the military dictatorship.

The experience of the *Taller Total* is included in the proposals for a change of paradigm of university teaching in the Seventies, which sought that the student stopped being treated as an object of the teaching to become its subject, as Antonio Fernández Alba defined when analysing the Spanish case in 1975:

“Implicit in these years, in the prolegomenon of the controversial attitude of the students, was the refusal to continue supporting an impeded teaching, to overcome the student-teacher contradictions, and to understand the architectural reality, not as an idealistic virtuality, but as a process transforming the physical environment of man; considerations that entail a reflective, critical and transforming posture towards their pedagogical environment”.¹²

12 Antonio Fernández Alba: *Ideología y enseñanza de la arquitectura en la España Contemporánea* (Madrid: Tucarc ediciones, 1975), 15.

13 The *Institución Libre de Enseñanza* (Institute of Free Teaching) was founded in 1876 by a group of Professors (among whom were Francisco Giner de los Rios, Gumersindo de Azcárate and Nicolás Salmerón), separated from the University through defending the freedom of the Chair, and refusing to adapt their lessons to the official dogmas in religious, political or moral matters. Francisco Giner de los Rios Foundation [Institución Libre de Enseñanza] <http://www.fundacionginer.org/historia.htm> (consulted on 4 September 2018).

14 Teodoro de Anasagasti, *Enseñanza de la Arquitectura* (Madrid: Espasa-Calpe, 1923), 107.

Within these changes in teaching, the appearance of vertical workshops, where different simultaneous mechanisms of learning took place in which the student became more participative, was one of the mechanisms to respond to these concerns in the schools of architecture. The vertical structure breaks part of the rigidity within the teacher-student relationship, by introducing other learning variables, such as that which occurs among students from different classes, or which increases the teacher-student coexistence. It is teaching that partly included the ideals of the *Institución Libre de Enseñanza*¹³ which were also present in the Spanish Schools of Architecture, via teachers who had been their students, or, who had established some type of bond, as this definition by Teodoro de Anasagasti shows:

“the [necessary teaching is that] which does not have the same appearance in all classes, nor the same books or notes; that which is different every year; that which is progressive; that which is difficult to teach, because the teacher becomes another student, a researcher, the best in the class, who continues to be inquiring in the class and who is not dogmatically rigid”.¹⁴

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The structure in Vertical Workshops also promotes a non-linear or non-stagnant learning, favouring the synchronous and circular processes, since in some way the paths of learning are trod several times, some as protagonists, and others as classmates. It is a characterisation of the organisation of the teaching of the Bauhaus, the continuity of which, through its teachers in American schools, such as the experimental Black Mountain College where Josef Albers taught and in which Buckminster Fuller prototyped his geodesic domes in his summer workshops of 1948 and 49, serves to feed the imagination of the pedagogical experiences in Architecture.

Vertical Workshops in the Higher Technical School of Architecture of Seville

The teaching of Projects in the Higher Technical School of Architecture of Seville underwent an important structural change from the 1974-75 academic year, after its fifteen year path from its foundation in 1960. The School had grown and consolidated in those years, integrating itself into Spanish university life, which did not remain at the margin of the social and political movements that were taking place outside of Spain. Against this background, the teachers who then taught in the Projects department¹⁵ understood that the educational methodology had to change. So, during that academic year, a series of meetings were held, coordinated by Alberto Donaire, the sole Professor of the department at that time.

In the words of Juan Luis Trillo: “The spring of 1975 was very effective for our objectives, we met once a week and the discussions were passionate, we all learned from everyone else. There was talk of the need to introduce theoretical classes on architectural critique, the specificity and autonomy of Projects, the possibility of extending the programmes from one to three courses, and the effectiveness of the “critique sessions”, carried out on the results obtained from each exercise. [...] One of the most significant agreements that we undertook in those meetings was to change the horizontal structure of courses for a mixed structure in which Elements of Composition, directed by Alberto Donaire, would remain as the only horizontal subject. This meant that all students would have to take it, and the rest of the teaching would be given by a series of vertical workshops that would allow students who wanted to, to take the three Project courses with a single programme. [...] Naturally we had information then about what happened in the other national schools, Madrid and Barcelona mainly, where there partially existed workshops mixed with horizontal subjects. In our opinion, the Sevillian alternative would be unique and the most advanced of all”.¹⁶

Thus, in the School of Architecture of Seville the three subjects of Projects were taught together, from the 1975-76 academic year, in some groupings that were called Workshops. In those, the students of the three levels were grouped in the same class, with the same teacher, or pair of teachers, where they shared the theoretical lessons, the exercises, in a partial manner as, usually, a place or line of action was proposed and the principles of the exercises were adjusted in complexity to each level,¹⁷ and perhaps, most importantly, the corrections and the critique sessions. This brought about, as in a craft workshop or in a family, learning between “almost” equals that was very beneficial. When you began in Projects you looked with admiration at the works presented by classmates from higher levels, their way of drawing, their rapidity in solving problems, their bibliographical references, you always found somebody to ask how to do this, or that, someone to ask for advice. There was a double learning, one classical, from teacher to student, and another by osmosis that was transmitted between the students of the different levels, where one passed from being a one hundred percent apprentice receiving knowledge in the first year, to being an “almost” teacher in the last, which also coincided with the last year of studies.

15 The teachers pertaining to the projects department in the 1975-75 academic year were: Manuel Alonso Gómez, Lino Álvarez Reguillo, Francisco Barrionuevo Ferrer, Daniel Carreras Matas, Antonio Cruz Villalón, Gonzalo Díaz Recasens, José García-Tapial León, Enrique Haro Ruíz, Luis Marín de Terán, Eduardo Martínez Zúñiga, Antonio Ortiz García, Francisco Torres Martínez, Juan Luis Trillo de Leyva and Manuel Trillo de Leyva. List extracted from: Juan Luis Trillo de Leyva, *De Memoria. Orígenes de la Escuela de Arquitectura de Sevilla* (Sevilla: Universidad de Sevilla, 2010), 242-243.

16 Juan Luis Trillo de Leyva, *De Memoria. Orígenes de la Escuela de Arquitectura de Sevilla* (Sevilla: Universidad de Sevilla, 2010), 234.

17 As an example, in the 1991/92 academic year, Workshop 9, directed by the teachers, Juan Luis Trillo de Leyva and Alfonso Ruiz Robles, within the common theme. The project on the landscape outlined three exercises, the first, Houses, Residences and Dwellings, indicated: “three different situations of residential intervention will be presented, one for each subject of projects (I, II and III), which will represent a major or minor manipulation of the concept of the dwelling, based on the “landscape” in which it is based.” Juan Luis Trillo de Leyva; Alfonso Ruiz Robles, *Taller nueve. Curso 1991.92* (Sevilla: Universidad de Sevilla, 1992), 6.

[Fig. 6]. Students constructing the geodesic Dome, Black Mountain College, 1949.



In parallel to this change in methodology, in 1975, a Ministerial order was approved whereby all technical degrees had their studies extended from 5 to 6 years. This decree forced all the Spanish Schools to draw up new curricula. Thus, in the 1975-76 academic year, a double change took place in the teaching at the Seville School. Firstly, the new curriculum began to be taught and the Workshops were implemented in the higher years. This new curriculum contained the same subjects of Projects as the previous one, it was just moved by a year, Elements of Composition passed from the second to the third, and Projects 1, 2 and 3, from the third, fourth and fifth, to the fourth, fifth and sixth. This is why the new teaching methodology implemented in the 1975-76 academic year was maintained throughout the duration of this curriculum, ending with the entry of Plan 98, which did substantially change the subjects to be taught and their teaching load, and which also served to operationally adjust a Department that had grown considerably in the twenty years since “Plan 75”.

In the Departmental meetings that preceded the structural change of Plan 75, a formula was sought which would break the teaching hierarchies and the rigid university discipline. The solution was deemed to be the creation of vertical workshops, a structure that had been verified as valid over the more than twenty years in which they were active. As in the Soviet “Free Artistic Workshops” of the Twenties, the working guidelines of a workshop were dictated by the teacher in charge, with total independence from the other workshops. There was total freedom to develop any initiative or pedagogical methodology, and also for the students, who could choose the teacher/s at the start of each academic year, which allowed errors to be corrected when, what was offered in class did not meet expectations, changing the workshop to the next year. For the teacher, Juan Luis Trillo, the lack of Professors in the School was what favoured the creation of these independent structures, in which each group of teachers could generate its own teaching programme, independently, and what helped to put the teaching of Projects in the Seville School on the map of the Spanish Schools, as the teacher at the Valencia School, José María Lozano, corroborates:

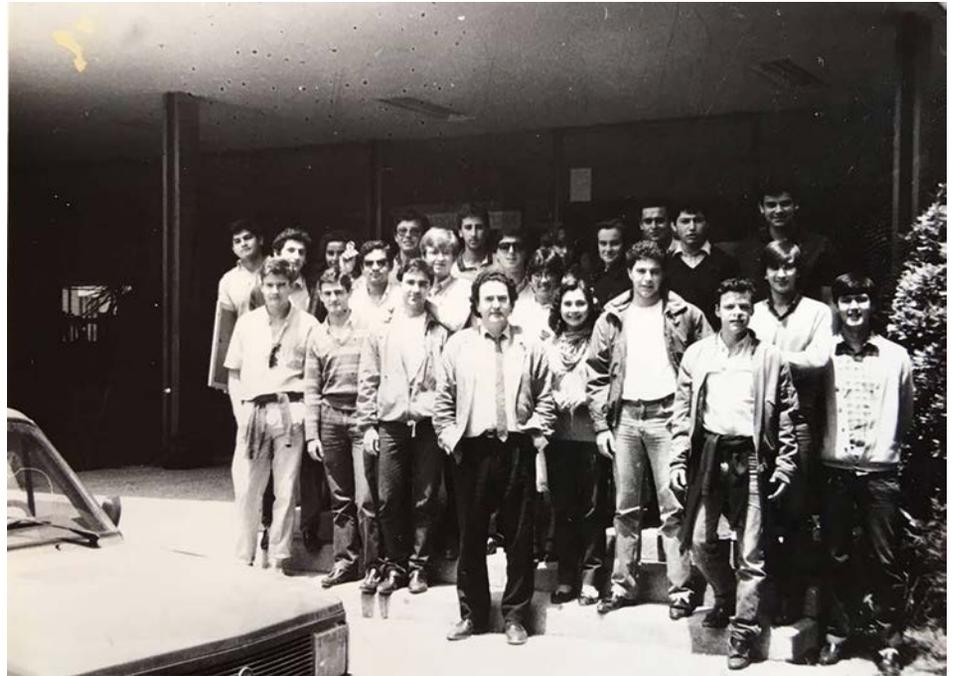
“The Schools of Seville and Valencia are similar in age and number of students. However, there are other organisational similarities observed that are based on a sufficiently distinct teaching structure [...] they

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[Fig. 7]. Students of Workshop 8 with the teacher, Antonio González Cordón, in front of the School, at the end of the Eighties. Source: Rafael Serrano.

now organise teaching (and as in Seville), by means of independent Workshops, which have an essentially vertical component. The passage of prestigious professionals through the Sevillian classrooms, and the unquestionable posture of their own architecture and that of the most beautiful city of Seville, has meant, it is correct to say, that the Andalusian School has today a specific weight greater than its Valencian counterpart".¹⁸

Initially, six vertical workshops were established in the Seville School, a small number, but, year by year, with the growing number of students, this number increased until there were thirteen in the 1994-95 academic year.¹⁹ There were also different configurations with one, two or three teachers, which generated an atomised and asymmetric structure which presented difficulties in the organisation of teaching.

In the 1994-95 academic year, the Department of Projects approved a new teaching structure, which, on the one hand, sought a reconstruction of its internal organisation which had deteriorated with the strong growth that the school experienced at the start of the Nineties, and, on the other, to adapt to the new curriculum that was being defined and which would be known as "Plan 98". This Plan initiated a cadence parallel to the political changes of government, so that the University autonomy was lost, and the curricula would be transformed by external requirements beyond the university processes, especially through alignment with a common European framework, also known as the Bologna Process.

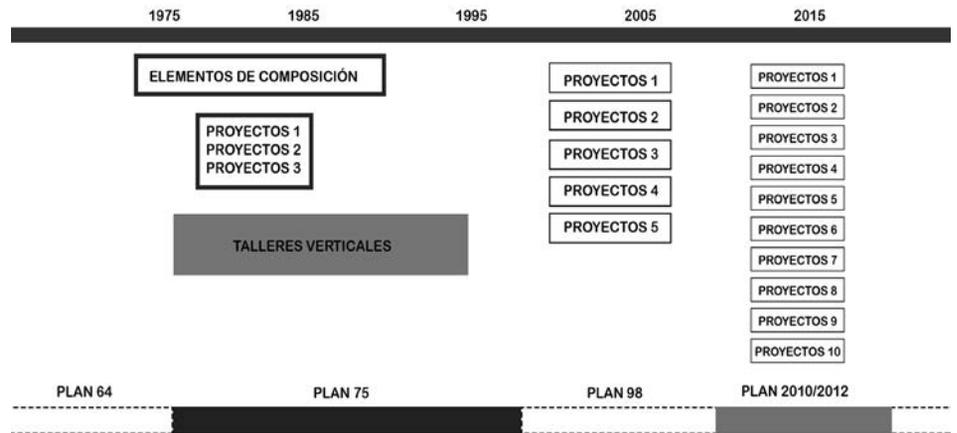
The 13 Vertical Workshops of Projects, made up of 25 teachers and the 17 teachers in charge of the Elements of Composition groups that existed in 1994-95 academic year, were redistributed into 6 Classroom-workshops. This was a new figure not reflected in the teaching organisation of the School, nor in the curricula, which were born as a structural and management alternative within the Department of Projects, and which survive until the present time. The proposed model attempted to articulate the horizontal requirement of the new curriculum, with the existing vertical structure, in such a way that the Classroom-Workshops were defined as a grouping of teachers that assumed teaching in each of the courses, which in Plan 98, would be the first to the fifth years, and in which they could organise their teaching projects together.²⁰ In the publication of this teaching framework the term teaching programme was substantially confused with that teaching project, a fact that, until recently, remained latent in many views of the departmental organisation.

18 José María Lozano Velasco, "La enseñanza de proyectos en España. Enseñar o aprender" *Arquitectura* nº297 (primer trimestre 1994): 34.

19 According to the teaching organisation plan approved on 09/06/1994 for the 1994-95 academic year, it would be the last year of operation of the Vertical Workshops in all the levels in the Higher Technical School of Architecture of Seville. Data obtained from the archive of the Department of Architectural Projects of the Higher Technical School of Architecture of the University of Seville.

20 The teaching plan of the Department of Architectural Projects defined the classroom-workshops as "structures of a vertical character regarding coherence in the development of the programmes, grouping of teaching staff and timetable, and they are coordinated among themselves by courses through the programmes and the Course Councils". Higher Technical School of Architecture. *Teaching programmes 95-96* (Seville: University of Seville, 1995), 205.

[Fig. 8]. Transformation of the teaching organisation of the Department of Projects of the Technical School of Architecture of Seville from its foundation to the present time. Source: Luisa Alarcón.



The reality was that the teaching structure of the Department of Projects stopped responding to a vertical structure in which, in each workshop, the same teachers synchronised teaching in successive classes, giving rise to a grid organisation, in which different teachers taught in each class, but they were grouped by affinities and interests, maintaining a vertical organisation by means of a common theme. This matrix organisation, in which the rows referred to the classes, and the columns to the grouping of teachers, represented a mechanism that initially allowed multiple interpretations and interactions. However, over time this demonstrated an enormous rigidity through not paying attention to the basic definition of grouping of teachers with compatible teaching interests. Its maintenance in time has demanded excessive symmetry as a condition, and has forced the quantitative association of the teachers, without taking into account their real affinities. The passage of the years has turned it into a glass grid that isolates the different Classroom-Workshops with a purely administrative function, and complicates the relationships between them. The structure, initially designed as a co-ordination mechanism, has become a frontier between groupings that are no longer formed naturally, hindering the assimilation of the logical transformations that have been taking place in the departmental faculty.

Current teaching co-ordination

The present curriculum, approved in the Higher Technical School of Architecture of Seville (Degree in Foundations of Architecture 2012), and the prior (Degree in Architecture 2010), tend towards a strong horizontal structure, reinforced by some sections defined within the *Report on the verification of the qualification of Degree in Foundations of Architecture by the University of Seville*, that describe every semester and mark the objectives of its teaching,²¹ and by the implementation of a subject of transverse character called Architecture Workshop that is developed in the second to the fifth.²² The integration of knowledge produced in these Workshops has, evidently, other benefits for the teaching of such a complex and diverse discipline as Architecture, but to a great extent the learning between students of different levels has been erased, since the main personal and academic relationships take place within each classroom, within a small and closed group of students and teachers.

Despite this tendency to horizontality within the panorama of the Spanish schools of architecture, there remain some examples of Vertical Workshops, such as those existing in the Valencia School. In its Teaching Plan, it indicates the teaching grouping of its projects teachers, showing those that each workshop have assigned in the different educational levels of the present curriculum and, even in the

21 The transverse and longitudinal co-ordination of the teaching will be carried out through diverse relationships between programmes and teaching projects of each subject, with respect to a common teaching project regarding the section of each semester, which will develop stable teaching teams.

The sections around which the teaching of each semester is structured are:

- 1st 01st semester. - Introduction to Architecture
- 02nd semester. - Introduction to Architecture
- 2nd 03rd semester. - HOUSE 04th semester. - BLOCK
- 3rd 05th semester. - EQUIPMENT 06th semester. - DISTRICT
- 4th 07th semester. - INFRASTRUCTURE 08th semester. - REHABILITATION
- 5th 09th semester. - CITY 10th semester. - WORKS"

Higher Technical School of Architecture.

Report on the verification of the qualification of Graduate in Foundations of Architecture by the University of Seville http://etsa.us.es/wp-content/uploads/file/233_memverif_%20Versi%C3%B3n%202pdf.pdf (consulted on 4 February 2019).

22 "The Workshop will be an instrument of integration around an architectural and urban intervention. The Plan consists of seven Workshops, one per semester, from the third". Higher Technical School of Architecture. *Report on the verification of the qualification of Graduate in Foundations of Architecture by the University of Seville.* http://etsa.us.es/wp-content/uploads/file/233_memverif_%20Versi%C3%B3n%202pdf.pdf (consulted on 4 February 2019).

Workshop 2, teachers share all the levels.²³ There are also integrating experiments of vertical and transverse teaching, in the manner of the Total Workshop, such as the Vertical Workshop of the UIC Barcelona School of Architecture, a workshop of one week's duration, in which all the students of the School participate in the first week of the course; the vertical workshop of Architecture organised in 2016 in the Higher School of Technical Lessons CEU-UCH; or, the integrated vertical Workshop on architecture and urbanism offered by the CESUGA among its elective subjects.

In the Seville School, during the 2012-13 and 2013-14 academic years, as a group of teachers,²⁴ we linked our subjects of different levels (3rd, 4th and 5th), seeking an experience similar to that offered by the old Projects Workshops. In those years, we shared a large part of the teaching programme, theoretical classes and critique sessions. The experience was enriching, since, in addition to the personal interest and learning inherent in comparing experiences between classmates, we observed great interest among the students, as much in those from higher years who felt motivated to give of their best in front of their classmates from lower levels, as those that saw those works as a benchmark to reach. To some extent, seeing how someone similar to you, another student, has reached the goal you are seeking, facilitates the understanding of the "paradox of learning to design", defined by Donald Schön in *Educating the reflective practitioner*: "The paradox of learning a really new skill is the following: That students cannot, at the outset, understand what they need to learn, they can only learn it by training themselves, and can only train themselves by beginning to do what they do not yet understand";²⁵ or, as Stefan Zweig also defines, the difficulty of unravelling the "mysteries of artistic creation",²⁶ of learning things whose meaning and importance cannot be grasped in advance, but whose learning ends up by using time in their comprehension, facing the problems, doing and undoing work.

Conclusions

The analysis of the above-mentioned examples of vertical structures of learning, and our own experience as students in the Vertical Studios of Plan 75 and as teachers within Plans 98 and 2010, leads us to understand that introducing linking elements between different levels reinforces learning, by adding another component to the teaching, especially because it increases the collaborative work and the synergies between students. These are elements which are essential to implement in today's society, which tends towards individuality from different fields, such as the technological, the social and the economic.

Vertical integration helps students in the acquisition of new skills, as occurs in the field of the Architecture, where students face the resolution of new problems with which they have not previously been confronted, since most of the subjects taught in schools of architecture have no similar equivalents in elementary and secondary education. It is in these initial stages of learning where the support of a close companion with a slightly superior level produces major benefits.

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24 The group of teachers was composed of: Luisa Alarcón González, Zacarías de Jorge Crespo, Juan Giles Domínguez and Francisco Montero Fernández.

25 Donald Schön, *La formación de profesionales reflexivos* (Barcelona: Paidós, 1992), 93.

26 With reference to the book by Stefan Zweig. *The mystery of the artistic creation*, where he says: "All acts of artistic creation require a previous condition, which is concentration. In addition, we have verified that there must exist one or another of two opposite elements, the unconscious or the conscious, divine inspiration or human work. [...] It is not enough that the artist is inspired to produce. They must also work and work to bring that inspiration to the perfect shape", Stefan Zweig, *El misterio de la creación artística* (Madrid: Sequitur, 2012), 35.



[Fig. 9]. Exercise of the 2012-13 academic year. Urban Recycling. Houses in houses. Transformed section of a pre-existing building of dwellings in San Juan de Aznalfarache (Seville). Student: Beatriz Herrero Moles.

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