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RESEARCH ARTICLE

MODELING WORKSHOPS IN ARCHITECTURE SCHOOLS ARE A HISTORICAL AND CURRENT NECESSITY

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ABSTRACT

In this article, the authors intend to analyse and learn as much as possible how the Layout Workshops of Architecture schools, in addition to producing architectural design prototypes and project models, function mainly as teaching support in an environment that becomes educational classroom. Students and teachers discuss and exchange information with the help of graphic technical language and scale models. Technological resources are basic needs for the development of projects and tutorials are a group tool to learn not only to project but to defend the values of one's own work. We will illustrate that the current basic needs of future architects will be to train with an open technology and within the reach of all designers with the aim of being competitive and current.

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INTRODUCTION

The Architecture Workshops can be considered as the oldest and most interesting didactic strategies to teach architecture that can be developed individually or in groups. The drawing understood as a graphic language to transmit knowledge between architects, builders and promoters, in reality it is not enough to represent the architectural model and must be completed with the production as a result prior to the elaboration of the architectural manufacture [Urbina, 2009]. To communicate in architecture, three forms of language have always been used: natural language, graphic language and architectural language. The third is the most reserved for architectural environments [Nera, 2020]. To give an idea of the importance of a manufacturing laboratory for architects, one must go back to the training received by members of the builders' associations in ancient Greece and Rome. In Rome there were associations that came called "CollegiaFaborum" whose creation is assigned to NumaPompilius in VII a. C. that had the objective of instructing associates until acquiring the title of "Magister" [https://lbssegurosnoticias. wordpress. military positions. With the fall of the Roman Empire, the formation of the architects did not undergo great changes since the associations continued maintaining a leading role and regulated in the code of the Longobard Rotary king of the year 643 dc, since then the associations were transformed into "masonry". A "Masonry" was a bricklayer and his word is recognized throughout the old European territory, the bricklayers grouped together to train architects from generation to generation and reveal the secrets of the profession, meeting periodically to solve problems of the trade [https://www.artistiticinesi-ineuropa.ch/ita/intro.html]. Of course, practical training in architecture was not just a Roman idea, since from then until reaching contemporary times it has always been of great importance. Sin duda, podemos vincular la masonería romana con una de las escuelas de arquitectura más importantes de la historia de la construcción, como es la "bauhaus" que deriva de la logia medieval "Bauhütte" (Baraca de la Construcción) y está compuesta por " bau "que significa construcción. y "haus" che significa casa, nombre que se identifica con el proceso de construcción [http://historiadelhabitat.blogspot.com/2011/11/la-bauhaus.html (accessed May 03, 2021].

The drawing is considered an aid to the production process, the initial work not the final product. According to Gropius, founder of the school, form followed function in the sense that the architectural object had to be projected throughout the process until the end of its production [https://it.wikipedia.org/wiki/Bauhaus]. The pedagogical system was similar to a crafts workshop, the teachers taught the students who were beginners. The courses were conducted by professors called artists who were joined by artisan professors to train students in production, which was thought to be a fundamental element for the development of future architects [Andreozzi, 2021].

MATERIALS AND METHODS

We will search the Internet for all possible information to understand how Spanish architecture schools use so-called layout workshops and what these workshops should have to support teaching from architecture. As we have already said in the introduction, this system has been important in the training of architects to bring them closer to construction. We will try to find out how they should be, and which ones are closest to teaching.

RESULTS

Internet search: Since the worldwide network of digital fabrication laboratories began to develop around 2001, the year in which the MIT known as Massachusetts Institute of Technology intended to put all its teaching materials online as part of the project called OpenCourseWare, it was clear that the general approach The idea was that all researchers in the world could take advantage of the resources generated and, in turn, be part of a chain of knowledge at a global level [https://es.wikipedia.org/wiki/Instituto_de_Tecnología_de_Massachusetts (accessed Jul. 10, 2021).]. Today, the expansion of the global network of FabLabs, Digital Manufacturing Laboratories, the “Maker” phenomenon that has occurred thanks to low-cost 3D printing together with OpenCourseWare will allow a change in new academic challenges since in a laboratory it is practically possible experiment with an idea to know its functionality [Fernandez-Vicente, 2015]. Especially in architecture these fablabs have an important and direct application since in this type of titles with the arrival of the digital age and more specifically of CAD manufacturing, Computer Aided Design together with the Computer Aided Manufacturing manufacturing system of CAM, The manufacturing system has not only been completed, but it has forced architecture schools to invest in spaces that are not only computer rooms, but also technological areas where spaces are occupied by machines and people. These spaces are called Model Workshops and are associated with the architecture prototyping laboratory, where a series of things related to the teaching of architecture are manufactured, such as small-scale models for understanding projects, structural nodes, design elements, even to assist in the manufacturing process in the production of devices to limit the spread of the recently spread COVID 19 virus around the world. The University of Alcalá, for example, has its own website where everything that has to do with CAD / CAM digital manufacturing stands out in the vertical menu: Computer rooms, Library, Model workshop, Cafeteria, Reprography, Materials, etc. From the same page you can understand what are the tools and equipment that make up the space but that in any case it is understood as a production laboratory and not as an educational classroom. [https:// arquitectura.uah. es/servicios/taller-maquetas.asp (accessed Jul. 10, 2021)]. Recently, the Higher Technical School of Architecture of Cartagena is equipping itself with a model workshop that, although it is still a space under construction, joins the schools that have understood that architecture is not only theoretical teaching but also the transmission of practical knowledge such as is announced in the White Paper on Architecture published by "Aneca" [http://www.aneca.es/ Documentos-y-publicaciones/Libros-Blancos (accessed Mar. 02, 2021)]. Since the Model Workshop was installed, teachers and researchers have used them for many of their teaching and research tasks, such as prototyping for structural node testing, for digital fabrication, even for project fixes or tutorials. We now proceed to describe what, in our opinion, would be an optimal space for teaching in the CAM laboratory applied to architecture.

The architectural modeling workshop as a teaching space:
Il "Future Classroom Lab" hereinafter FCL, offers professional development opportunities to teachers through workshops and new pedagogical trends [https://auladelfuturo.intef.es/ noticias/ reunion-future- classroom-lab-lead-ambassadors-en-madrid/ (accessed May 16, 2021).]. The FCL has inspired many schools and teachers helped by the Future Classroom Ambassador, which is a network of teachers appointed by the ministries of different countries for the integration of innovative processes in schools. Of course, a model workshop that serves to teach needs a place that we could call "Partner Space" where the actions to be carried out in the manufacturing process are discussed at all times, where the tasks are distributed among the members, where throughout the time Throughout manufacturing, a critical analysis of what has been done is processed to correct and improve. To the latter it is necessary to add a "PC Space" where technical drawings, renders, animations and modeling prior to layout can be made. In the "Forum Space", very important for the global exhibition of ideas, the members will give place to a global discussion where solutions will be provided. To these must be added a "Massmedia Space" where tutors must improve the communication methods of the students that the students will use when they become architects to expose their projects with the help of technology. Of course, it would not be a laboratory if a "Maker Space" was not added, essential for manufacturing, where each piece manufactured is a process of production-learning-discussion-learning. In this chain is where the student is formed and where the collective criticism will form the architect of the future who will be skilled in the search for technical solutions to social and individual problems

DISCUSION

The importance of modeling workshops for the development of teaching is something that schools have understood as fundamental, it is not a case that, in more recent history, schools like the Bauhaus that have marked an era and influenced until the day of today they have used the transmission of knowledge about production. The history of architecture training, in turn, has generated what is considered the most important school of architecture in the world, as ratified by the "World Classification of QS Universities" which is the MIT School of Architecture and Planning (MIT School of Arquitecture and Planning). The Bauhaus-MIT chain describes the current situation, there is no adequate training in

architecture without digital production. Of course, almost all European architecture schools are not lucky enough to have educational FabLabs where novel materials and productions are experienced, but they could build spaces such as Model Workshops that support the mandatory teaching production of the architecture student and improve skills. social of the future architect.

CONCLUSION

The Model Workshops applied to architecture are spaces where architecture teachers and students can train in a fun confrontation, a digital gym where it is intended to exercise the muscle of the social vocation through empathy with others. On the other hand, in a world where the autonomous production process between the machines and the reproductive machine is investigated, it remains like a distant dream. The human who masters technology is once again the center of attention to have it at his disposal.

- The training process is participatory and fun, it removes barriers to place all participants on the same level to grow together.
- The student learns to handle the technologies at their fingertips and will understand that they will always be at the center of a technological universe.
- It provides the architect with the social skills that are fundamental to his profession and introduces him to the world of digital production.

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