

# The Design Studio beyond Donald Schön's Traditional Approach

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Architecture teaching centered on project-based learning has been a broadly recognized and validated model, used in different latitudes since almost a century ago, when instruction moved away from actual practice and into contemporary academia<sup>1</sup>.

The model is based on a strong constructivist approach (even though the term was coined later), and was not systematized until Schön formulated his interpretation in the 1980s. Based on Dewey's postulates<sup>2</sup> on active learning, he described the design studio as an educational model for reflection in action<sup>3</sup> in his book 'Educating the Reflective Practitioner', thus inserting the teaching-learning processes historically developed by architects and designers into contemporary education theories.

The author makes a strong case against current professional education and the educational system's inability to resolve the complexities of real life, a system that does not take into account how professionals work in their practices. He postulates a new epistemology of professional practice, along with a new theory on professional action, which recognizes the way in which expert practitioners resolve situations, in their particular manner, through an intuitive combination of "knowledge-in-action" and "reflection-in-action."

Schön emphasizes the tutor-guided design process, and centers in this guidance the basis for learning through observation, assimilation and imitation of the tutor's demonstrations. At the same time, he recognizes that "practicum" work takes place through some kind of combination of the students' learning-by-doing, their interaction with their tutors and classmates, and a more diffuse "experiential" learning process<sup>4</sup>. Nevertheless, he does not delve further into this last point, which imbues the process with a constructivist vision.

Schön's model is applied in architecture schools with few variants. His pedagogical ideas about learning theory and practice have dominated professional training, presenting architecture teaching as a paradigm for all professional education.

However, in the last decade, the model has had its detractors. Beyond the accusation that he formulated a theory based on research whose methodological validity is

questionable<sup>5</sup>, there are other aspects in his vision of what a design studio is that are not addressed with the level of complexity this educational context demands, reducing this process, as many other studies on the design studio do, to the moments of instructor correction and to what happens in pedagogical terms regarding tutor or expert review of the students' work. This vision upholds the teacher as the person in the know, and the student more as a passive observer than an active learner. The main role of teachers is to correct the students' work, not so much to help them develop or polish their skills<sup>6</sup>; a situation which can only take place within a real dialog among peers, of the kind that dissipates hierarchies within the design studio, thus fostering relatively unknown aspects in architecture teaching, such as the hidden curriculum<sup>7</sup>.

Helena Webster from Oxford Brookes University sheds light on this subject when presenting a qualitative study that raises the issue of the tutor-student relationship in the design studio. Through interviews, the author reveals the different points of view of students and tutors regarding the same studio process. When teachers were asked to look back on their experiences, they admitted there much frustration, reporting unproductive sessions, when their methods for guiding the process had not worked. They complained about the students' lack of motivation and talent.

On the other hand, good experiences were associated with sound motivation, advanced knowledge and talent of students, which enabled tutors and learners to think on the "same plane". The somewhat disturbing comments suggest, according to Webster, that teachers believe their role as tutors to be optimal only when the level of "acculturation" in design studio matters is advanced. "Tutors were incapable of helping those that did not know how to design"<sup>8</sup>. This study is decisive, and unfortunately we do not discuss situation, but it is the likely cause of elevated degrees of desertion from architecture schools, and failure in design studio courses. The question becomes which didactic structure we ought to apply, as tutors, to initiate students in design processes, instead of presenting them with problems they clearly are unable to solve without spoonfeeding from the tutor? How do we detonate processes within them that will make them more interactive and autonomous, and move away from mimesis of the tutor's ideas and demonstrations?

In a pedagogical scenario as complex as the architecture design studio, we, tutors, must make an effort to build a context where students can primarily develop their autonomy, reaffirm their own points of view, and strengthen, appreciate and apply the knowledge they bring. The objective of this proposal is not to negate Schön's invaluable contributions, but rather to complement forgotten and indispensable aspects in the current social and political context.

## Learning Styles

The teaching-learning strategies applied in the

design studio do not consider the individual nature of learning observed by Kolb<sup>9</sup>, whose postulates suggest that learning is achieved through the transformation of experiences (reflective learning cycle). This new paradigm still promotes project-based teaching and reflective thinking techniques, but with an emphasis on the individuality of the student.

Kolb states that the theory's name is derived from the experiential work of Dewey, Lewin and Piaget. He takes Dewey's philosophical pragmatism, Lewin's social psychology, and Piaget's genetic epistemology and cognitive development into a singular perspective for development and learning.

Experiential theory defines learning as the process where knowledge is created through the transformation of experiences. Knowledge is the result of a combination in the way we detect and prove ideas within network experiences.

The model presents two diametrically related modes of perceiving information – Concrete Experience (CE) and Abstract Conceptualization (AC) – and two opposing modes of transforming experience – Reflective Observation (RO) and Active Experimentation (AE).

Concrete or immediate experience is the basis for observations and reflections. These reflections are assimilated and transformed into abstract concepts, from which new repercussions for action can be established. We can prove these repercussions actively, and they work as guidelines to create new experiences.

A closer analysis of the theory suggests that the student requires opposing skills and that he or she must constantly choose which set of skills to use in a given learning situation<sup>10</sup>.

In detecting experiences, some of us perceive new information by experiencing the concrete, the tangible, feeling the world through our senses and becoming immersed in concrete reality. Others tend to perceive, detect or deal with new information through symbolic representation or abstract conceptualization, thinking, analyzing, or through systematic planning rather than using the senses as a guide. In a similar manner, in the transformation or processing of experiences some tend to carefully observe others who have been through the same experience and reflect on what happens, while others opt to throw themselves into doing things. The observers prefer Reflective Observation, while the others tended towards Active Experimentation.

Each aspect of the learning process presents itself to us as an option, as it is impossible to carry out both variables at the same time. What we do to settle the conflict is to choose one. Given our hereditary traits, our past experiences, and the demands of the environment, we develop a preferred choice. We resolve the conflict between concrete or abstract, active or reflective, in ways that have characteristic patterns, which we call learning styles.

Combining these four approaches to the learning experience, Kolb defines four learning styles: accommodating (active), divergent (reflective), assimilating (theoretical) and convergent (pragmatic).

Kolb's Experiential Theory is broadly accepted and has been the basis for several learning style models of information processing.

### **Felder and Silverman's Learning Style Model**

In 1988, Richard Felder and Linda Silverman formulated a model that interprets learning styles as preferences in the way of perceiving, operating, and accomplishing comprehension. The model classifies students according to the categories they choose in each bi-polar dimension, defined as follows:

How we process information:

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How we process information:

Active (learns by experimenting, doing things and working with others) or Reflective (learns by thinking and working alone)

The kind of information we preferentially perceive

Sensing (concrete thinker, pragmatic, guided by facts and processes) or Intuitive (abstract thinker, innovative, guided by theories and meanings)

How we perceive sensory information:

Visual (prefers visual representations and visual material presentations: diagrams, slides, etc.) or Verbal (prefers written or spoken explanations).

How we progress in the understanding process:

Sequential (linear thought process, learns in small steps that increase over time) or Global (systemic thinker, learns from the general, in huge leaps).

### **Student types according to the Learning Style Model by Felder and Silverman<sup>12</sup>**

#### **Active and Reflective students**

An active student tends to retain and comprehend information better when carrying out some activity with it, applying it, discussing it or explaining it to others, working in groups, or in empirical tasks in the field. Reflective students prefer to first silently think of what they want to do with the information received, and would rather work alone, examining and manipulating information introspectively.

#### **Sensing and Intuitive students**

Sensing learners are motivated by the pragmatic and the useful. They generally have a realistic vision of life, and like to act in accordance with procedures towards defined goals. They like to solve well-posed problems. Sensing people like results and like to solve problems through established

methods; they do not like complications and surprises. Meanwhile, intuitive students are imaginative. They like flexibility and the freedom to explore and discover new possibilities and ideas. They get bored with repetition and detail. However, they do not mind complexity. Sensing learners, also called sensorial or kinesthetic, tend to be patient with details and are good at memorizing facts. Intuitive students are better at taking on new concepts and feel more comfortable than their sensing counterparts with abstract formulations, symbols and mathematics. Sensing learners tend to be more careful, but they can at times be slower; intuitives are quicker, but less careful.

#### **Visual and Verbal Students**

Visual students are those who remember information best they receive through images, flowcharts, films and demonstrations. They are more likely to forget things said without some emphasis. On the other hand, a verbal person learns best from spoken or written explanations. They will glean much information from what they hear, and even more if they hear it and then verbalize it. They learn a great deal from debates, and even more efficiently, when they in turn explain things to others.

#### **Sequential and Global Students**

Sequential – also, receptive or inductive – individuals are those who learn from the particular to the general, step by step. They prefer information doled out gradually, growing in difficulty. They follow linear lines of reasoning when dealing with problems. They can solve a situation having an incomplete understanding of the material, and their solutions are generally orderly and easy to follow. However, they lack access to the complete context of the body of knowledge in the field involved, and its relationships with other issues or disciplines. Global or transformative students are those who learn associating seemingly disconnected fragments, and achieve understanding in a holistic manner, in great leaps and bounds. They perform slowly, even poorly, until they have 'the bigger picture', and visualize connections with other issues that sequential learners do not perceive. To understand something, they must first have a general idea of what is needed; they prefer complex concepts presented in advance, thus managing to synthesize them more easily.

#### **Intervention in Design Studio I**

The following proposal is framed within Elliott's action research model<sup>13</sup>, which identifies a general idea, designs actions to carry out, and proposes a plan, its execution and evaluation within a pedagogical scenario, in this case design studio I. The steps are partly described in this article, the research having begun in 2011, and has been evaluated with different players, for repetition each year since.

The main idea is to approach a didactic strategy that allows incorporating the different learning styles of the students in

design studio I, in the School of Architecture at Universidad Austral de Chile. The first step was to identify the type of learning style this group prefers; to accomplish this, a Felder and Silverman Index of Learning Styles Questionnaire<sup>14</sup> was applied, consisting of 44 brief items, structured in four groups or sections of 11 items, corresponding to the four dimensions described.

The results of the 2018 group, which included 66 first-year students, were as follows [Fig. 01]

It is interesting to note the similarity with results gathered in previous years<sup>15</sup>, where the learning styles predominant among the students were identified – active, sensing, visual and global – and where the same trend is observed, except for the variable that relates to thought processing, where the 2018 students are mostly sequential. This is probably a trend in the students that enter this school, although it could also be the case in other architecture schools similar to ours, regional institutions with comparable student bodies, an assertion that needs to be verified in subsequent studies.

These are, therefore, the learning styles that predominate in our studios. The learners develop better understanding if they apply the information empirically, working in groups on clearly defined tasks that increase in difficulty over time. In this pedagogical scenario, reaching this student group so they become interested in, and successful at, design studio work requires tackling spatial issues from fields of information perception and processing that differ from those we are historically accustomed to, with strategies that were rather reflective and intuitive in their approach to spatial study.

#### **Proposal Objectives**

Our aim is to establish methodologies we have termed 'kinesthetic', which incorporate the body, at some point of the learning process, as a catalyst for the spatial experience. This approach accommodates very well those students prone to active and sensing learning style modalities, which were indeed the preferred options.

Working with sequential and inductive mind frames that go from the particular to the general, where information is presented gradually, in increasing degrees of difficulty, constructing linear lines of reasoning, in search for the solution to a problem – these will undoubtedly aid sequential and sensing students. This aspect is not always addressed in Studio didactics, producing breaches and black boxes that break down associations and relationships between the different studies required to visualize a project. Particularly in the 2018 design studio I group of students, sequential learners amounted to more than 65%, making the need for pedagogical strategies that work well with this group especially urgent.

Another objective is to redeploy the moment of review, as described by Schön<sup>16</sup>. As the author explains, review takes place once a project is already in the works. The preceding

process is imprecise, and ultimately, project success much depends on the tutor's final reviews and input. The proposed model emphasizes the process in the way of gathering, relating and representing information. Revealing the processes will create more autonomy in students and in their results (sequential, active).

These measures are specifically directed at increasing autonomy in design studio processes, in accordance with the way students learn. In terms of exercise design, this translates into setting the exercise rules clearly, giving the students a set of instructions and tools with which to go ahead and make their own decisions, with minimal tutor influence. It must be taken into account that this is the initial exercise first-year students encounter, and if we want them to work and make decisions autonomously, we have to be precise in our instructions, along with providing the indispensable didactic support.

### Initial Exercises

Following are descriptions of exercises present in the initial modules of the first semester in the school of architecture at Austral University. The contents are in accordance with the competencies stated in the curriculum for this level of advance, and have to do with observing and drawing, selecting to design, measuring and changing scales, and tracing and sizing with the body. The work was carried out by the 2016 Studio class, mentored by teachers: Carolina Ihle, Pablo Ojeda and Eric Arentsen.

### Piranesi on the Beach

This exercise takes on the issues of traditional architectural representation, in this case, working with Piranesi's etching of Campus Martius (1762), in accordance with the objectives described above. Each student group autonomously transits along the different stages of the process, from a literal copy of etching fragments, to proposing and executing a 1:1 scale tracing of a palace from Campus Martius [Fig. 09]. That way, the didactics innovates in re-seeing and revaluing classic architectural representation, through contemporary experiential teaching-learning approaches, where representation on paper (hand-eye relationship) is transferred to a 1:1 scale tracing (body-space relationship).

### Drawing is Observing

The first step is to precisely draw Piranesi's etching Campus Martius (1762). Each student gets two quadrants of the etching, at twice the scale of the original, and they must reproduce it, by tracing over glass. This is an active observation exercise to understand the basic components of architectural drawing, the point and the line, together with the disposition, density and thickness that give the drawing expression (active, sequential). Later, all portions are joined, and the complete etching comes together, reproduced twice as large as the original. Part of the idea behind the exercise is to empirically introduce the students to the relationship between the total and the fragment. The

students must organize to carry out the task of mounting and hanging the large format piece (active).

### Select to Design

These are students that are just arriving in the architecture school, and it is necessary they understand that selecting is the primordial action of design. This stage consist in elaborating mirrors and mounts, and to select a reflection axis of a palace or building in Campus Martius. The idea is to draw the original and the reflection, thereby composing a new floorplan. Many alternatives are presented. Students can work in groups or individually, and finally, each group chooses one floorplan.

### Measuring and changing the scale

Each group (34) works on a reflected floorplan of Piranesi's palace. They have to change the scale and incorporate measurements and axes. In this stage, a contest is carried out to choose among the 34 proposals one that complies with requirements set forth in the studio. Afterwards, a series of architecture drawings are generated, at different scales, and with different purposes, to execute the design tracing in a planned manner. Students are organized in teams, by task, and tools for tracing and drawing in sand are elaborated.

### Tracing and Sizing with Body

Finally, the building is traced on the beach, thus completing the experiential learning cycle that began, in this case, reproducing a fragment of a drawing, advancing sequentially towards a phase where the body, experiencing the extension of the traced building, can empirically size one dimension in space (sensing, active).

The act of tracing is a complex labor. It took one week to design it together with the students. Each member of the studio, including tutors, had a specific, fully planned, executed and documented task to carry out.

We have carried out this translation exercise – from an etching or drawing, to the tracing process – since 2016, with different initial drawings, and diverse spots for tracing. 2016 was the year of Piranesi and Campus Martius, presented herein. In 2017, it was Turgot's Map of Paris (1739), while in 2018, the exercise was developed out of a Venice etching from a similar date. These latest drawings are in axonometric projection, which adds considerably to the difficulty level. The methodology is still in constant evaluation, as are its implications to the students' learning.

### Conclusion

Understanding that a project can be the product of a superposition of project actions that arise from sequential processes, as those shown in these exercises, is a strong conceptual change, part of the transformation we have experienced, as tutors, implementing this approach.

The students' autonomy is observable throughout the process and the project actions (which we consider an achievement for the active group). The sequential manner in which the different problems were accessed identifies the cognitive routes each group took. Corrections lean more towards these internal processes, becoming an opportunity to understand how the students gather and process information. The final project is the result of these processes, and requires less guidance from the tutors. The students construct their own narrative and they share that with the group, in order to coordinate larger objectives, which, unbeknownst to them, are the essence of the discipline.

The design of teaching-learning strategies that incorporate the body (kinesthetic) has been a sound entry point into the concepts, language and point of view that shape an architect. By this approach that incorporates the student group with preferences towards active and sensing learning styles, we have reverted a trend the active group showed in previous studies, towards performance difficulties at the design studio<sup>17</sup>. According to statistics, between 2011 and 2015, on average, 50% of students failed the class. Consequently, in 2017, only 26% of students failed a course with equivalent difficulty levels as in previous years.

1. Inge Mewburn, "Lost in translation: Reconsidering reflective practice and design studio pedagogy", *Art and Humanities in Higher Education*, Vol.11, n° 4 (2011): 363-379.

2. More information on active learning in: John Dewey, "Intelligence in the modern world, John Dewey's philosophy" (USA: Random House, 1939), 605-82.

3. Details on Schön's formative model in: Donald Schön, "La formación de profesionales reflexivos", (Barcelona: Paidós Ibérica, S.A. 1992), 49-157.

4. *Ibid.*, p.46.

5. Helena Webster, "Architectural Education after Schön: Cracks, blurs, boundaries and beyond", *Journal for Education in the Built Environment*, Vol. 3, Issue 2, (December 2008): 63-74.

6. *Ibid.*, p.68.

7. As described by Thomas A. Dutton in: "Design and Studio Pedagogy", *Journal of Architectural Education*, Vol. 41, No. 1 (1987): 16-25.

8. Helena Webster, "Facilitating critically reflective learning: excavating the role of the design tutor in architectural education", *Art, Design & Communication in Higher Education* 2, no. 3 (October 2005): 101-111.

9. David A. Kolb, "Experiential Learning", (Englewood Cliffs, NJ: Prentice-Hall, 1984), 26-27.

10. *Ibid.*, p.29.

11. Richard M. Felder. "Matters of style", *ASEE Prism*, (January 1997): 18-23.

Richard M. Felder. "Reaching the second tier – Learning and teaching styles in college science education", *Journal of College Science Teaching*, 23, (January 1995): 286-290.

12. Richard M. Felder and Linda K. Silverman, "Learning and Teaching Styles In Engineering Education", *Engineering Education*, 78, (1988) : 674 – 681.

13. Antonio La Torre B., "La investigación acción" en *Metodología de la Investigación Educativa*, ed. Bisquerra Alzina (Madrid: La Muralla, 2009), 364-394.

14. Richard M. Felder and Barbara A. Soloman, Index of Learning Styles. NC State University. <https://www.webtools.ncsu.edu/learningstyles/>

15. In 2011, in the context of the author's Master's Thesis, the learning style preferences of architecture majors was investigated and contrasted with their studio performance. See: Eric Arentsen, "Aproximación a una didáctica integradora de los estilos de aprendizaje en el taller de arquitectura: diagnóstico y propuesta" (Magister, Universidad del Bío-Bío, Chile, 2012), 33-44.

16. Schön, *La formación de profesionales reflexivos*, 113.

17. Arentsen, "Aproximación a una didáctica integradora de los estilos de aprendizaje en el taller de arquitectura: diagnóstico y propuesta", 43.

Project-based learning  
Styles of learning  
Active research  
Tutor-student relationship  
Graphic representation