The Design Studio
The Formation of the Place and Its Pedagogy

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THE DESIGN STUDIO AS A RESEARCH SUBJECT

The design studio is unquestionably of the utmost importance in architectural education. But this does not mean that we have sufficient understanding about its essence and mechanism. The teaching of design is usually thought of in the same way as the practice of design; people prefer to do it rather than to talk about it. As Sarah Dinham remarks,

> *"Compared with other fields such as teacher education and medicine, architecture and architects have conducted surprisingly little research on educational questions. Creative innovation, yes, and passionate interest, and thoughtful criticism, but little formal research."*[1]

Following a brief review of the literature on design teaching, we are surprised by the fact that what limited knowledge we have about the design studio as a research subject comes mainly from the contributions of scholars in other disciplines. The work most frequently referred to is that of Donald Schön, former professor of MIT. He saw the design studio as a model for educating reflective practitioners and a unique method for teaching tacit knowledge through a process of "reflection-in-action." Because of his work, this aspect of the design studio is now seen, not in a negative light, but as an essential quality from which, as he suggested, the other disciplines within today's research based university system should learn.

Schön's main research focus is on the interaction between the instructor and the student in the design studio. In this paper, the author intends to propose a different approach to the study of the design studio characterized as the model of place. The main point is to consider the design studio as a place within a particular educational context. We can identify three notions of place, as atelier, workshop, and design lab, each of which is associated with a particular school of thought in the history of architectural education. The study further suggests that the interrelationship between the method of design and the method of teaching is one of the essential characteristics of architectural education. Successful studio teaching only becomes possible when the aspects of the design studio — place, program, and execution — coincide with an idea of architecture. As such, we have developed a thinking strategy for the design studio.

THE DESIGN STUDIO AS A METHOD OF "REFLECTION-IN-ACTION"

Architectural design is usually considered a discipline which is hard to learn from written texts or through self-study. It certainly seems natural for a person in our modern society who wants to become an architect to go to an architectural school. A student who enters a school of architecture today, immediately faces a learning situation which is totally strange to him. Instead of continuously attending lectures, most of his time will be spent in the design studio. As Schön described it:

> "I ask you to imagine an architectural studio. The setting is a loft-like space in which each of twenty students has arranged his or her own drawing tables, paper, books, pictures and models. This is the space in which students spend much of their working lives, at times talking together, but mostly engaged in private, parallel pursuit of the common design task."[2]

The design studio is a unique format of education because it is derived from its own tradition and serves a

particular educational purpose. What Schön attempted to understand about this unique format of education are basically two issues: 1) What could be taught and learned in the design studio; 2) What is the mechanism of the design studio.

The Artistry of Designing

Schön is interested in the design studio from the point of view of professional education in general and architectural education in particular. Professional education, as he pointed out, has been long dominated by the positivist epistemology which stresses the use of describable, testable, replicable techniques derived from scientific research and based on knowledge that is objective, consensual, cumulative and convergent. What Schön questioned about this type of education is not whether professional knowledge about subjects is ill structured or fails to train students in the application of professional knowledge, but its philosophical foundation — the positivist epistemology. Knowledge taught in universities is only suitable for well-defined problems. But there are the indeterminate zones of practice, which present a conflicting situation of complexity, uncertainty, and uniqueness. It is a failure of modern university education that it does not train students deal with the problems derived from such indeterminate zones. He found , however, that the training carried on in architectural education provides a valuable exception.

"Architecture is a profession rooted in the artistry of designing — a process that is not wholly mysterious but rather, at least in part, describable… The architectural studio is intrinsically interesting to those schools because it presents a tradition of education for reflection-in-action — for problem-setting, ad hoc theory-building, on-the-spot-experimenting — that other professions are learning increasingly to value."[3]

What one can learn from the design studio is the artistry of designing. It does "not depend on our being able to describe what we know how to do or even to entertain in conscious thought the knowledge our actions reveal."[4] The kind of knowledge taught in the normal design studio can be described as follows:

"When we go about the spontaneous, intuitive performance of the actions of everyday life, we show ourselves to be knowledgeable in a special way. Often, we cannot say what it is that we know. When we try to describe it, we find ourselves at a loss, or we produce descriptions that are obviously inappropriate. Our knowing is ordinarily tacit,

implicit in our patterns of action and in our feel for the stuff with which we are dealing. It seems right to say that our knowing is in our action."[5]

A METHOD OF REFLECTION-IN-ACTION

In Schön's view, the design studio works by way of reciprocal exposure. The teacher exposes his way of seeing, thinking, and doing which has a positive impact on the learner, while the learner exposes his way of seeing, thinking, and doing on the evidence of his drawings, models, and words. Learning only occurs at the moments when these two exposures meet. Schön named this process, "on-the-spot-experiments." Therefore, the effectiveness of design studio teaching depends on two conditions. The first is that the context must be one in which the student is actively engaged in trying to do something. He is blocked somewhere in the midst of the process; he is waiting for the studio teacher's intervention. The second is that demonstrating and imitating, telling and listening, must take the form of reciprocal reflection-in-action. The studio teacher tries to figure out what the student understands, what his problems are, what he needs to know, all of these from the main evidence of observation of the student's design. The studio teacher's interventions, then, are experiments which test both the studio teacher's grasp of the student's understanding and the effectiveness of his intervention. In this way, the studio teacher reflects-in-action. The student tries to grasp the meaning of the teacher's showing and telling, and seeks to translate what he grasps into his own performance. Each such performance is an experiment which expresses the sense the student has made of what he has observed or heard and tests the means by which he translates that sense into the task of designing. In this way, the student reflects-in-action.[6]

THE MODEL OF INTERACTION VERSUS THE MODEL OF PLACE

The Limitation of the Model of Interaction

Schön's study is exclusively on the interaction between the instructor and the student. He suggested that it is the interaction-demonstrating and imitating, telling and listening-between two parties which determines the effectiveness of the design studio. He made this discovery based upon two case studies, which he and his colleagues conducted at the MIT in the 1970's. The research engaged in by Schön involved a method called "the stimulated recall interview" which is widely used in

educational research. Its operation normally follows a procedure of video recording, review and analysis. First, a studio teaching session is videotaped. As soon as possible after videotaping, an interview with the teacher and the students is conducted. During the interview, participants are asked to watch the videotape playback and stop the tape at any point at which they can remember the nature of their thoughts. Their verbal reports are audio taped and transcribed for later content analysis. Using this method, Schön was able to give us a clear description of the type of knowledge taught in the design studio, the mechanism of its operation and its effectiveness through ''reflection-in-action.''

We may refer to this type of study on the design studio as the model of interaction. Clearly, the interaction between the instructor and the student is what we see in a studio setting. This may lead us to believe that this is all the design studio is about. Fig. 1 illustrates Schön's model of the design studio. The most prominent image in the diagram is the interaction between the instructor and the student. The interaction is realized through the medium of a design task which is represented in dotted lines, which implies that its impact on the resultant interaction is noticed but not counted. The place is also represented in dotted lines for the same reason. For Schön, the design studio is no more than a physical place, which can be found in any school of architecture. Both place and task are treated as neutral conditions in the model of interaction.
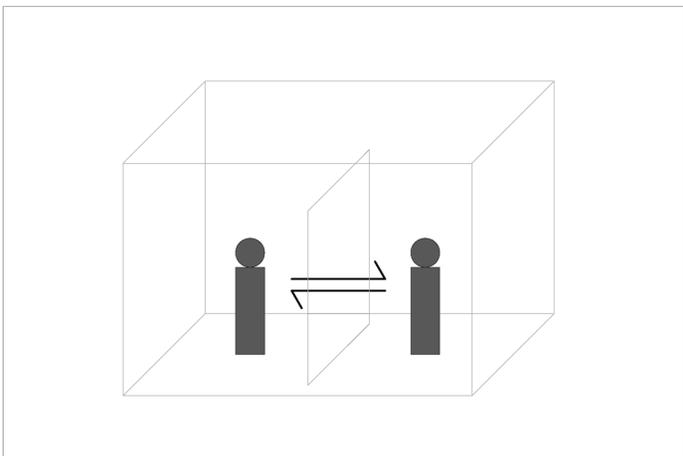

Fig. 1. The Model of Interaction

The Model of Place

We should not underestimate the importance of the interaction between the instructor and the student for the success of studio teaching. But there seems a lack of further description by Schön of the underlying driving force which causes an interaction to happen. We do not know whether the use of different teaching modes by an instructor — demonstrating and telling — is a result of free choice, of an intuitive response in a context, or of some predefined factors. Some important factors seem to have been forgotten. To reveal the nature of the design studio, we have to shift our focus from ''activity'' to ''place,'' from a study of activities happening inside the studio to a study of the formation of the design studio within a particular educational context. By this change, a different approach to the study of the design studio is formed.

As shown in fig. 2, the model of place presents a holistic view of the design studio with a focus on the formation of studio place. We are not talking about the physical setup of the studio space, its location, size, and shape, but about the ideology and pedagogy embedded in it. We assume that the different formations of place may stipulate the role of the teacher and the learner in the play, and suggest the way of teaching and learning. The medium of studio interaction should also be taken into account. A design task or program is not simply a design brief but a plan of actions. In the model of place, the interaction between the instructor and the student, which is Schön's primary focus, is considered as the consequence of other factors.
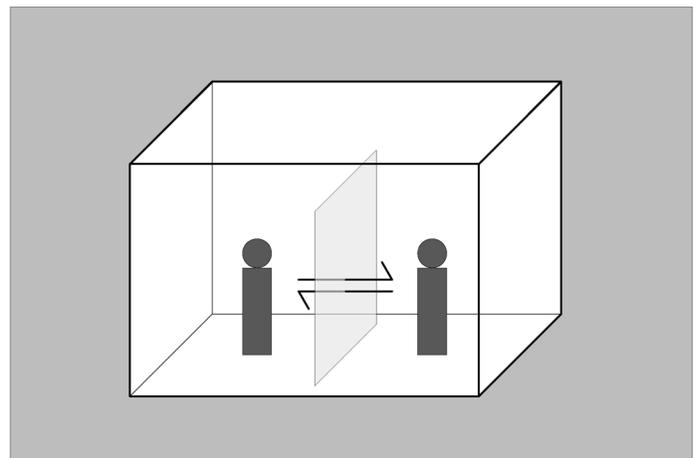

Fig. 2. The Model of Place

It seems therefore that the best way to elucidate the nature of the design studio is through case studies of past teaching models. Three cases have been selected. The Ecole des Beaux-Arts and the Bauhaus are accepted as two original resources of modern professional education in architecture; a proper understanding of the design studio simply cannot be reached without going back to these two schools. The third case, the Texas Rangers, originally an American experiment at the University of Texas in Austin during the 1950's, is taken

as an exemplar of studio instruction in a university context. In each of these three cases, the first aspect examined is the formation of place. Three types of instructional environments are described: atelier, workshop, and design laboratory.

THREE NOTIONS OF PLACE

The Beaux-Arts and the Atelier

During the late nineteenth and early twentieth century, the Ecole des Beaux-Arts in Paris formed an academic approach to architectural education. It originated from two contradictory educational ideas from far back in history: the Academy and the atelier. When the academic approach was first founded, the most significant change in the form of education was clearly the regular lectures delivered by academicians in the Academy. The academicians, whose interests were in the theory of design, must have realized that the best way to learn the artistry of designing was to work with practicing architects.

The atelier was an institution where the students of the Ecole could learn design in addition to lectures and libraries. Not only was the name borrowed from the guild master's workshop of the Middle Ages, but the method of master-apprentice training also remained. But the atelier at the Ecole was not an architect's office and the students who studied in the atelier were not contracted apprentices in the Middle Ages sense. The atelier was purely for teaching purposes, and was conducted by a master or *patron*. Most of the students concentrated on a few large ateliers. For a long time the atelier remained a private institution with a loose connection to the Academy. Generally speaking, the attraction of the atelier was twofold: an experienced master offering guidance, and the company of students sharing their learning experiences.

Here, we are faced with a rather contradictory structure for learning architectural design. On the one hand, the Academy was devoted to the rational, teachable principles of architecture. On the other, the atelier continued the tradition of apprenticeship. This combination reached its highest peak of sophistication and maturity at the Ecole des Beaux-Arts, the design competition system providing the linkage. The best known design competition at the Ecole is the *Grand Prix de Rome*. However, we focus on the monthly competition because its operation clearly demonstrates the instructional method in use at the Beaux-Arts. Generally speaking, there were only two types of exercises, differing in duration. The *esquisse* was a key exercise and the only

one which took place in the Ecole's building. It was carried out *en loge* in a twelve hour period. If it was followed by a long session of study and rendering work, it was called *esquisse — project rendu*. If it took place only for its own sake it was called *esquisse — esquisse*. The *esquisse — project rendu* presents a typical working method, from concept to development to presentation. However, this method of work was taught neither through the Academy, nor in the atelier. It was institutionalized through the organization of design competitions and implemented in different places with the involvement of different professionals.

The Bauhaus and the Workshop

The value of the apprenticeship system was rediscovered with the founding of the Bauhaus in 1919. Gropius adopted the mediaeval *Bauhütte* as the model of the ideal place for design training. He felt that the mediaeval ''lodges'' were an ideal framework which would make it possible to gather ''all related artist-craftsmen — architects, sculptors, craftsmen of all grades in a homogeneous spirit and humbly contribute their independent work to the common tasks resting upon them.''[7] The training of craftsman in the *Bauhütte* system contained three steps. Anyone wanting to learn a craft had to advance through various stages in a master's workshop: from apprentice to journeyman to master craftsman, after which one was admitted to the guild as a fully qualified expert. These three stages of study became the main structure of the Bauhaus' instruction in the manifesto of 1919.

Gropius initially intended to place practical training in outside factories. Finally, however, he formed the workshop within the Bauhaus. The integration of art and craft, theory and practice, can be achieved through co-operation between an artist and a craftsman in the workshop. The workshop training was divided into two sections: *Werklehre* and *Formlehre*. *Werklehre*, or practical instruction under the supervision of the Master Craftsman included training in the handling of materials and tools. *Formlehre*, or formal instruction taught by the Master of Form, was devoted to the study of formal aspects, geometry and presentational skills. But Gropius also aimed to close the central division between *Werklehre* and *Formlehre* by the appointment of studio-masters who were equally proficient in both. This goal was finally achieved when some of the Bauhaus graduates started to teach in the school.

Through Gropius' efforts the idea of integration of art and technology was eventually institutionalized as *Werklehre* and *Formlehre* within the workshop. This is something which makes the Bauhaus different from the

other arts and crafts schools existing around that time. The origins of workshop training go back to the Middle Ages, when apprentices worked very closely with their masters on the job and learned their skills directly from practice. The term "workshop" must denote something different from "atelier." The former is mainly a place to make products, and design is only an integrated part of the process. The latter is clearly defined in the "academic" sense as a drafting-room where the whole endeavor is devoted to "designing" on paper.

The Bauhaus workshop was far more than a mere place for making products. As Gropius pointed out: "The Bauhaus workshops were really laboratories for working out practical new designs for present-day articles and improving models for mass-production."[8] The shift from products to prototypes was a significant achievement of the Bauhaus. It resulted in a clear distinction between the Bauhaus workshops and other places where the crafts-made products were the main purpose. As the workshops became the place for experiment and for making models, a new design methodology emerged. The Beaux-Arts developed a drawing-board based design process. The new design process developed at the Bauhaus was exclusively based on model-making. Furniture, lamps, even buildings were models for future mass production. It was due to the Bauhaus that a model-based design process became popular later in architectural schools around the world.

The Texas Rangers and the Design Lab

In the United States, the pioneers of architectural education appreciated the potential of the atelier system run by practicing architects, but they failed to establish a pattern similar to the Paris model. The atelier finally became drafting-rooms or grand drafting-rooms located in the university. Accordingly, professional full-time design teachers emerged. During the Second World War, a group of Bauhaus teachers moved to the US. Moholy-Nagy referred to the learning place of his new design school in Chicago as the design lab. This term has been popular in the United State since the 1960's. Although the term design lab conveys the same pedagogic idea as the Bauhaus workshop, the laboratory as a standard facility in the university also implied a new attitude towards design education.

The Texas Rangers is an exceptional and unprecedented teaching program developed by a group of young architects and scholars during the 1950s in Austin, United States. There was no direct evidence to support the argument that the Texas Rangers promoted the notion of the design lab. In fact, Caragonne only uses the term design studio in his book on the Texas

Rangers. It is what this group of young scholars did that best represents the notion of design lab, especially the teaching of Bernhard Hoesli, which has become an exemplar of design teaching in today's university system.

What the Texas Rangers intended to achieve was a new design program of modern architecture based on the common denominator of the space concept. As the main contributor to its pedagogic development, Hoesli adopted a seemingly scientific view of the design studio, seeing it as a laboratory in which the scientific experiment is conditioned, transacted, observed, recorded, analyzed, and evaluated in terms of scientific rules. He recorded the daily activities of the class, the processes of the students, their response to the teaching, the results of their work, and his own reflections and conclusions. In this way teaching became transparent rather than obscure, controlled rather than random. Hoesli's pedagogical thought marks a new attitude towards design teaching which stresses the shift from subject matter to the matter of learning. This attitude can be understood, on one hand, as a reflection to the Beaux-Arts' and the Bauhaus' legacy, and on the other, as a response to the demands of university education.

FURTHER THOUGHTS ON THE MODEL OF PLACE

We have briefly introduced three notions of place as atelier, workshop and design lab. Each of these terms is associated with a particular school of thought in the history of architectural education. The design studio is a complex entity which cannot easily be grasped from a single psychological, behavioral or instructional point of view. The model of place represents a new approach to the study of the design studio which is different than that which Schön and scholars of other fields used in their studies. It provides a holistic view of the nature of the design studio, which has been somehow neglected in the model of interaction.

The Method of Design versus the Method of Teaching

The interrelationship between the method of design and the method of teaching is one of the main characteristics of the design studio. In the current discussion about pedagogy within the university, there is a tendency to treat teaching method as an independent subject which can be applied to any teaching situation. It might be true that the method of teaching can be discussed separately from the content of teaching if we consider a subject such as mathematics. The use of a new teaching method may well improve the

effectiveness of teaching math. But it would not change the content. However, this might not be true in architecture. We cannot fully understand teaching in a design studio without reference to the idea of architecture associated with it because the content of the teaching, a method of work, is embedded in the mode of teaching. The above analysis of three schools has made the point clear that changes in the notion of the place imply changes in how design should is taught and learned.

The nature of design studio teaching is that the teacher and the student are engaged in one design process. A teacher usually conducts the student's performance in accordance with his vision of architecture and method of work. As a consequence, a teacher must show his preference in selecting a mode of instruction. Some teachers prefer to make reference to precedents, to demonstrate, to draw their solutions directly on the paper instead of talking. Some teachers avoid using precedents, preferring to encourage the student to explore his own solution. A teacher's method of design limits his choice in his method of teaching, consciously or unconsciously.

A Beaux-Arts teacher tended to use demonstration as his preferred teaching method. A Beaux-Arts student was expected to imitate what had been drawn by his teacher. Paul Cret was an exemplar of this type of teacher. ''Cret's criticism was largely on rolls of tracing paper spread over the student's problem, drawing with a soft pencil and with a minimum of talk.''[9] This mode of teaching was certainly not freely chosen. It is predefined by the method of Beaux-Arts design. In contrast, the mode of demonstration and imitation was prohibited in a school of modern architecture. The Bauhaus teacher, Josef Albers, is an exemplar of another type of teaching. He was notable for his teaching method in that he only gave his students short instructions then let them alone in the classroom. Students had little to guide them, apart from their own inventiveness and their instinctual sense of the property of materials. He was convinced that any creative work should start from an aimless play. Therefore, Albers's method of teaching can be understood through his vision of design education.

Strategies of Design Teaching

Design studio instruction is an easy task for an architect-master because all he needs to do is to expose to the students his way of thinking, observing, and designing. It becomes difficult only if an educator intends to make his teaching more formal and explicit. To do so, he is not only required to be competent in designing, but

also aware of the student's potential for learning, a most important necessity for design pedagogy.

Dinham realizes that the role of a design teacher is to shape a proper educational environment that promotes learning.

> ''Teaching can be seen as a design task-as an effort to conceptualize and then bring about certain changes to a positive end. This premise implies that the function of teaching is to arrange — to design and implement — a context in which learning can flourish.''[10]

In this respect, the model of place developed provides an applicable thinking method. In accordance with the model of place, the effectiveness of the design studio depends on the following four elements:

1) The idea of architecture,

2) The formation of the place,

3) The formation of the program,

4) The execution of the studio teaching.

If we consider that the ultimate task of the design studio is to make a particular method of work teachable, the study of the three schools further reveals that each school adopted a different strategy for the purpose. In the case of the Beaux-Arts, the method of work was taught indirectly through the arrangement of places in two major phases as esquisse and project rendu. The institutionalization of the design method ensured that a particular method of work was teachable. In this process, both the professors in the Ecole and the masters in the atelier only played supporting roles. In the case of the Bauhaus, the role of the individual teacher's exploration became dominant. The workshop system was adopted not for the purpose of implementing a defined method of work but of providing a proper context for experimentation and exploration. In the case of the Texas Rangers, the main emphasis was on the development of a new teaching program through which modern architecture becomes teachable. The program consists of a series of design exercises and projects. Ideally, it can be discussed and disseminated without referring to any individuals.

To emphasize, successful studio teaching only becomes possible when the aspects of the design studio — place, method, and execution — coincide with the idea of architecture. A clearly defined idea of architecture is

essential. Everything else can be seen as techniques which ensure that the idea is transferable.

NOTES

[1] Sarah Dinham. ''The Possibilities for Research on Architectural Teaching'' *Architectural Record*, 4 (1987): p. 41-43.

[2] Donald Schoen, *The Design Studio: An Exploration of Its Traditions and Potential,* (London: RIBA Publication Limited, 1985): p. 32.

[3] Ibid., p. 83.

[4] Donald Schoen, *Educating the Reflective Practitioner,* (San Francisco: Jossey-Bass Publishers, 1987): p. 22.

[5] Schoen, *The Design Studio,* p. 21.

[6] Ibid., p. 64.

[7] Hans Wingler, *The Bauhaus,* (Cambridge: The MIT Press, 1986) p. 23-24.

[8] Walter Gropius, *New Architecture and Bauhaus,* (London: Faber & Faber, 1935): p. 53.

[9] Paul Cret, *Architect and Teacher*, (Philadelphia: Art Alliance Press, 1973): p. 27.

[10] Sarah Dinham, ''Teaching as design: Theory, Research and Implications for Design Teaching'' *Design Studies,* 4 (1989): p. 80-88.

REFERENCE

Caragonne, Alexader, *Notes on the Texas Rangers — A Short History of A Teaching Program at the University of Texas School of Architecture 1953-1958*, Cambridge: The MIT Press, 1995.

Cret, Paul, *Architect and Teacher*, Philadelphia: Art Alliance Press, 1973.

Dinham, Sarah, ''The Possibilities for Research on Architectural Teaching,'' *The Architectural Record*, 4 (1987): p. 41 & 43.

Dinham, Sarah, ''Teaching as design: Theory, Research and Implications for Design Teaching'' *Design Studies,* 4 (1989): p. 80-88.

Drexler, Arthur, (ed.) *The Architecture of the Ecole des Beaux-Arts*, London: Secker & Warburg, 1977.

Gropius, Walter, *The New Architecture and the Bauhaus*, London: Faber & Faber, 1935.

Harbeson, John. *The Study of Architectural Design — with Special Reference to the Program of the Beaux-Arts Institute of Design*, New York: Pencil Points Press, 1926.

Hoesli, Bernhard. *Architektur Lehren: Bernhard Hoesli an der Architekturabteilung der ETH Zuerich*, Zuerich: Institut fuer Geschichte und Theorie der Architektur ETH, 1989.

Schön, Donald, *The Design Studio: An Exploration of Its Traditions and Potentials*, London: RIBA Publications, 1985.

Schön, Donald, *Educating the Reflective Practitioner,* Jossey-Bass Publishers, 1987.

Wingler, Hans. *The Bauhaus — Weimar Dessau Berlin Chicago*, Cambridge — Mass.& London: The MIT Press, 1978.