

Validity of the Case Study Approach to Design Teaching

Or How to Make Architectural Education More at Home in the Academic Setting

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INTRODUCTION

The pedagogical style of the architectural design studio has been the norm for teaching design since early this century, when newly formed architectural programs in this country adapted the atelier setting of the French Ecole des Beaux-Arts and the apprenticeship to a practicing architect. However, the deeper architectural education tries to take root in a university setting, the clearer does the discrepancy seem to become between studio teaching and the academic environment.¹ On the one hand, some educators in other fields who strive to devise active learning opportunities would value tutoring in the design studio.² On the other hand, however, it would be a serious oversight if we ignored a never-ending chain of difficult questions. The first set of questions are on the notion of architecture as a discipline: Is it possible to objectify our subject matter, architectural design? And if so, is it the best method to work on the particulars of a few design projects? How can we transmit a body of knowledge in the hit-or-miss situation of the studio? The second set has to do with the role of faculty members: By keeping the atelier format, are we saying that a studio instructor is a studio master? Is she expected to be an absolute figure whose values are all that matter? Especially under the pressure of budget cutting, we also face a third set of questions: How can we justify having the lowest student-faculty ratio on the entire campus?

This paper deals with questions and concerns regarding a new set of design courses instituted recently at a college of architecture in a state university after numerous reviews and discussions by the faculty. This sequence of courses, centered on the case study approach, consists of demonstrations by faculty and exercises by students concerning how various design issues, cast in their theoretical, technological, and societal dimensions, were synthesized in a number of precedents. The courses, having taken over a small portion (two out of twelve hours per week) of studio hours, are intended to reinforce design teaching, and, at the same time, produce more credit hours with less faculty time commitment. The courses are designed to have a student-instructor ratio simi-

lar to that of lecture courses rather than studios which they are to complement. In the studio, students will continue to learn design by doing, while in the complementary courses, they will learn by studying how others have done it. The case study courses were conceived as a step toward ensuring more rigor in design teaching. This paper intends to discuss the validity of the case study approach in design teaching in relation to a number of shortcomings identified in the previous curriculum structure: the frustrating gap between design studios and so-called support courses; the hit-or-miss approach of many studio projects, if not in reality, in the students' perception; the lack of architectural observation experience among the College's student body. This paper will also examine the pedagogical content of the courses: the view of architectural design this course will portray; and the type of analytical exercises used in case studies which, once applied, are meant to become useful design tools in the studio.

BACKGROUND OF NEW COURSES

In a climate of budget reduction, the college of architecture came under heavy criticism by the university administration for having the highest ratio of cost to semester credit hour on campus. This perceived inefficiency of architectural education is the result chiefly of the fact that design studios, set in a low student-to-faculty ratio, occupy the largest portion of faculty teaching hours and yet are assigned only one-half the credit hours that a comparable lecture course would receive.

This indication of inefficiency is in a way misleading: When the price of college education is based on the number of credit hours students take, as is the case here, then the higher the ratio of students per faculty, the more economical education is for the university. Typical instruction in the fields of fine arts and performing arts takes place in private or semiprivate settings and is therefore not regarded as economical or efficient. However, in an imaginary situation in which the course price is set by the level of faculty contact hours (each student paying his/her share), an architectural

program would generate comparatively high revenue simply because the teaching hours of the architecture faculty are generally greater than those in most other disciplines.

To make the matter of calculation worse, as noted, only one-half the number of actual hours of the studio are granted as credit hours, while lecture courses receive full credit. The problem seems to be that, although architectural educators accept the studio as a better, if not the best, way of teaching and learning architectural design, the university community at large often fails to acknowledge the nature of the pedagogy represented by the architectural design studio. Instead, university administrators often consider the studio similar to the laboratory in natural and applied sciences, that is, as a setting which offers a time-consuming but strictly hands-on learning experience involving little actual teaching.

On the superficial level of calculation, there are two simple ways to make architectural instruction more cost-effective: To increase the student-faculty ratio in studios or to double the credit hours assigned to the studio. The first—raising the ratio of students' credit hours per faculty teaching hour—is an obvious but unpopular solution. There probably are some innovative methods to achieve this and still maintain the quality of design instruction. For example, one can conceive of a success by an appropriate application of technology. Furthermore, "table crits," or "group crits," in which a number of students with a similar concern gather around a table and discuss it with a faculty member, could be adopted in place of at least some portion of "desk crits," that is, individual attention. However, these strategies did not gain much support from the faculty. The maximum number of students per studio has been reduced from more than twenty to sixteen in the last few years, and the faculty thought that this achievement should be maintained, if not bolstered.

Another simple way to increase the appearance of teaching efficiency is to double the credit hours assigned to the studios, from half the number of the actual hours to a full credit. However, although this better reflects the value that the architectural faculty conceive for studio teaching, it turned out to be a practical impossibility, for it would have required approval from the university administration and the state's educational board.

Instead of raising the student-faculty ratio in studios or changing the credit hours assigned to design studios, the faculty chose to take the criticism of the university administration as an opportunity to review the college's architectural design pedagogy.

OBJECTIVES OF THE CASE STUDY COURSES

The time-honored pedagogy of architectural design studio was evaluated for any possible changes in the direction of increasing the students credit hours/faculty teaching hour ratio, especially in the context of the particular type of students our college tends to attract. The issues were identified: the frustrating gap between design studios and so-called support courses; the lack of experiences of architec-

ture among our students, the difficulty of field trips caused by our geographical isolation; and the perceived hit-or-miss quality of many studio projects.

In response to the issues identified, a proposal was made and, after much discussion, an agreement was reached to allocate two hours per week out of twelve total studio hours to a design course which would center on case studies. This course was designated as a lecture course. With the two courses combined, the ratio of student credit hours to faculty teaching hour increased about thirty-five percent from the previous studio alone for a class of eighty students: Previously, for twelve actual hours (six credit hours) and five sections of sixteen students each, the studio generated four hundred and eighty semester credit hours for sixty hours of faculty commitment. In comparison, the combination of the two courses would produce seven credit hours per student for the same actual hours (five from the studio and two from the case study course), and would require only fifty-two hours of faculty involvement. For the entire curriculum, the efficiency of the students' credit hours per faculty teaching hour increased about nineteen percent.

The new sequence is also intended to rectify shortcomings in the traditional curriculum structure. This sequence of courses is designed to bridge the gap between design studios and support courses and is intended to offer a knowledge-based approach to architectural design. Additionally, the case studies are intended to compensate in some degree for the lack of architectural observation experience of our students.

a. Bridge Between Design Studios and Support Courses

In order to clarify the relationship between the two basic components of the traditional architectural curriculum, namely design studios and so-called support courses offered in the lecture format, such as history, theory, and technology, and to understand the role the new case study course will play, it may be beneficial to make a brief comparison between architectural design studio learning and that of the laboratory. The difference is clear to architectural educators: While a laboratory is usually the place to confirm the principles learned through its counterpart lecture course, much more takes place in a studio: The principles of design are supposed to be revealed through actual designing activities in the studio, through "reflection in action" as Donald Schon called it. The support courses in the architectural curriculum do little to set up prescription for architectural design and instead literally support the design teaching of the studio, giving relevant information and knowledge for design.

It can be said that the issues dealt with in support courses are not to be taken as direct and sole causes of architectural design, nor is the design the result of such causes. Instead, these issues have to be treated as significant elements of the complex design conditions whose synthesis depends on the architect's unique creativity.

Clearly, in this understanding of architecture, design is characterized as a synthesis of the requirements derived from

the principles of related disciplines and the conditions drawn from the particular project. The architect therefore is required not only to have sufficient knowledge of these fields but also to have the ability to synthesize into a whole these pieces of knowledge, which sometimes conflict with each other. While in the support courses students acquire knowledge of related disciplines, in the design studios they learn to produce out of synthesis a concrete and decisive form of architecture.

However apparent this dual track conception of architectural education may be to the educators, the relationship between support courses and design studios is not always clear to the students. Rather, the students often see these two to be disconnected. When students learn that someone can earn an "A" grade in the studio while making a "C" in a structure course, they perceive disconnection. In another instance, when a student tries to come up with a design by directly applying the principles of solar energy learned in a support course, he/she may be criticized by the studio instructor for not taking other issues into consideration. As the result of such experiences, some students come to believe architectural design is capricious and arbitrary, and ultimately to view architecture as less reliable than applied sciences and less coherent than other disciplines. These students need to be shown that there is no cause-and-effect relationship between architectural design and related disciplines, but instead, architectural design is a synthetic activity.

The proposal to instill a sequence of design courses based on the case study approach stems from this understanding of the synthetic relationship between architectural design and other disciplines and from the need for demonstrating this relationship to students. Whereas traditional studios may have provided opportunities for students to acquire an understanding of architectural design as a synthetic procedure, as well as to examine ways to meet various design concerns through doing, that is, actually working on specific design projects, case study courses can, it was argued, expose students more explicitly to this special characteristic of architectural design. Additionally, it can demonstrate how others have synthesized various requirements, conditions, and objectives. As the third component of the curriculum, case study courses would become a bridge between the two existing elements of the curriculum.

b. Rigor in Architectural Design

In relation to the perceived gap between architectural design and other related disciplines, there is a notion, a misunderstanding even, among students that success in studio is a hit-or-miss affair. As a result they perceive design as arbitrary and capricious, not something that can be rationalized or discussed. The fact that a student relies on the studio instructor's authority (exemplified in the question "What do you want me to do?") or resorts to personal taste (revealed in the statement "I did that because I liked it.") reveals this perception. Some students feel that while support courses provide a solid foundation of knowledge and objective logic,

architectural design is purely a personal statement.

The case study approach is expected to demonstrate to such students that architectural design is not a matter of caprice, but is a logical construct, and is a suitable subject for rigorous discussion. The instructor of the case study course makes the point by inviting students to analyze a particular design as the product of various concerns and requirements. The role of design intentions has to be examined as something that enables the architect to make sound design judgments while he/she tries to synthesize a number of conditions. In this view of architectural design, the subjectivity of the architect then is not taken as the matter of caprice, but is considered as the source of the creative synthesis. It is hoped that students will begin to care about the "why" of architectural design.

c. Quasi-Experience of Architecture

In addition to working as a bridge between studios and support courses and offering a knowledge-based understanding of architectural design, the sequence of case study courses has another objective that stems from an understanding that a source of imagination and creativity is to be found

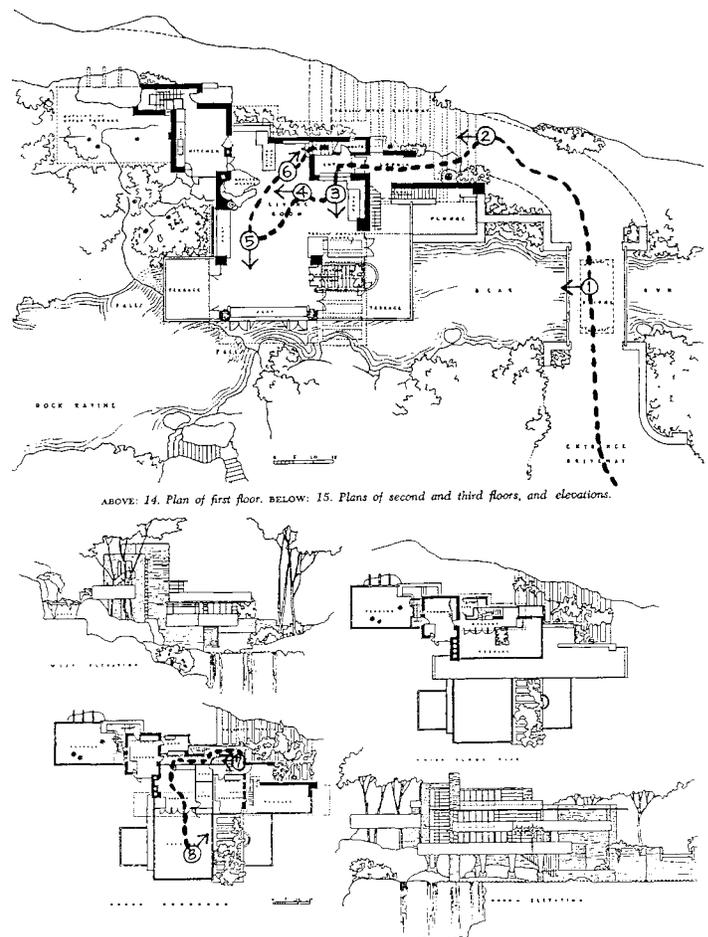


Fig. 1. Procession and space identification. Source: Donald Hoffmann, *Frank Lloyd Wright's Fallingwater: The House and Its History* (New York: Dover Publications, 1978).

in actual experience of architecture. The third objective, therefore, is to compensate for students' lack of exposure to actual buildings and architectural space and the paucity of field trips due to the geographical isolation of the university. Coming from rural and suburban areas, the majority of students have had very little such exposure.

In the case study course, students are exposed to selected pieces of architecture through readings, drawings, and photographs. The faculty concluded that by a carefully planned presentation of such materials the students could have an experience fairly close to the real one. For example, by arranging the photographs of the building in the order of spatial experience, and presenting them in slide form, the faculty can create the sense of being in the space among the students (Figure 1). Furthermore, when the exercise of identifying the camera's location and angle on the floor plan is combined with this type of slide presentation, students gain not only the experience of the particular piece of architecture but also acquire skill in making an appropriate depiction of the architectural space being designed, a skill the faculty has identified as needing development among the students.

PEDAGOGICAL CONTENTS OF THE CASE STUDY COURSE

In respect to the above objectives of this course, the pedagogical contents have two main focal issues: First is an examination of how design as synthesis was performed in a given case, and the second is the introduction of methods of graphic analysis used to examine cases, which in return are expected to become design tools.

When an architectural design is seen as a synthesis of related information and concerns that are identified through the study of the program and other qualifying conditions, which sometimes conflict with each other, then the important question that needs to be explored is how to prioritize all the issues that present themselves concerned. In addition, when design alternatives have been formulated, each of which may present different sets of advantages and disadvantages in relation to such design concerns, there arises a need to make judgments between these alternatives. Through case studies, it is expected that students will discover the importance and necessity of having what Alberto Pérez-Gomez has called a *storia*, or, in students' terms, design concept or design idea. It is by this *storia* alone that a design becomes an ordered and organized whole, the synthesis of numerous design concerns.

For example, through a study of the building that the College of Architecture occupies, the students learned that the grid pattern of the structure was not solely a response to structural necessity, but was the result of evaluating a set of complex issues such as the purpose of the space, the image of the building, site orientation, and distribution of electrical, HVAC, and plumbing systems.

A number of methods for analyzing case studies were

introduced with the hope that they would be used by students not only as analytical tools for already existing pieces of architecture but also as tools of visualization and imagination. Seen as a sign production, the representation that takes place during a design process moves from the abstract to the concrete. This is opposite from most other cases, such as the process of making a token, from real sheep to a disk with an indented line.' A method of graphic analysis, in itself a way to abstract a particular aspect of concrete examples of already existing architectural designs, can then be used, by reversing the course, as an initial sketch of a future design project. For example, a diagram of circulation helps the students to grasp a given case (Figure 2). To compare with the original floor plan, with its many types of information gathered simultaneously and drawn to detail, a diagram emphasizes a particular aspect of design by selecting an issue and eliminating other information in its simplified graphic representation. By comparing the two kinds of graphic depiction and making an effort to come up with a more abstract graphic from a full-fledged floor plan, the students learn to find architectural order in a given design.

After a particular method of graphic analysis has been introduced and the students have learned to use it to analyze a case, they are asked to apply the same method as a means of visualization. The exercise then is to come up with a floor

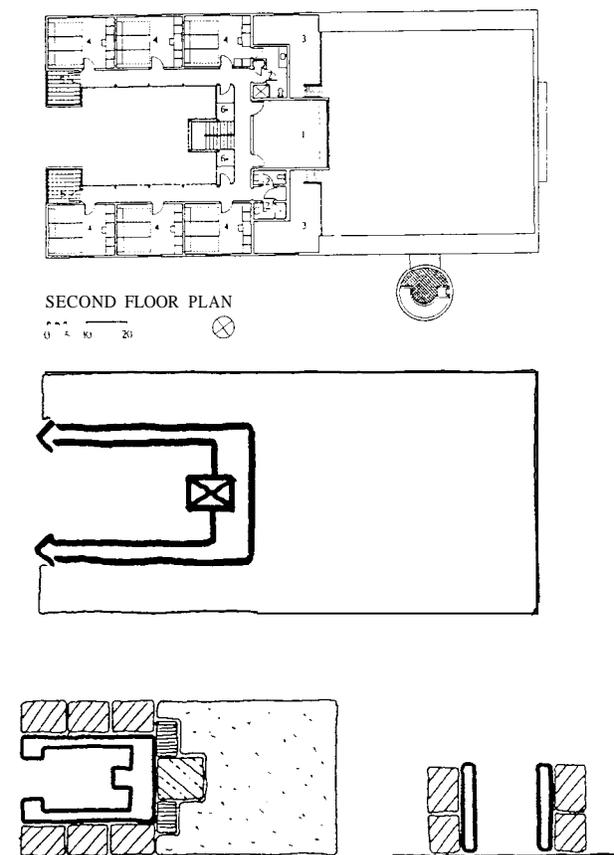


Fig. 2. Abstraction of a given case. Source: Ellen Shoshkes, *The Design Process: Case Studies in Project Development* (New York: Whitney Library of Design, 1989).

plan for a given circulation pattern (Figure 3). Such graphic tools are applicable not only as a means to generate a design in the beginning of the design process, but also as the tools of evaluate and improve one's design in the middle of the design activities. Here one can say that architectural design is conceived as the transformation from the abstract to the concrete, while the study of cases is performed in the opposite direction, from the concrete to abstract. The tools that allow one to abstract graphically the given design of case studies can then be used to generate an initial sketch. Once the initial sketch is drawn, then one can evaluate, just as one did in the case study, the design of the initial stage. One can then make an improvement over the initial sketch (Figure 4).

Another method of design analysis that can be used as a generative tool is that of structural system. Here the students were asked to depict the structure of given cases (Figure 5). After the analysis is completed, the students used the same abstraction process to come up with structural systems for their own designs in the studio. (Figure 6)

The notion that a particular projection of drawing allows a specific view of a design can be introduced as a third kind of graphic analysis. In the examination of the representation of axonometric drawing, which makes an architect see a design as a composition of masses or volumes, the students were asked to identify the three-dimensional elements in a chosen case. The students then were asked to come up with an alternative of the design, keeping the basic shape of each element. Of course, in this short exercise performed in twenty minutes, there are a number of important design concerns that are omitted from consideration. Still, the students were at least encouraged by this method. They are

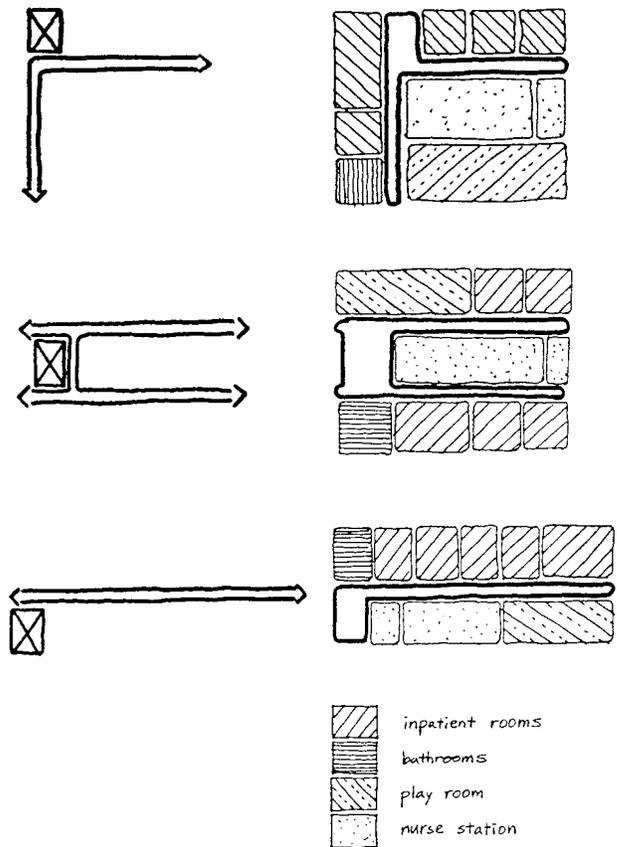


Fig. 4. Studies of floor patterns for a children's hospital inpatient wing.

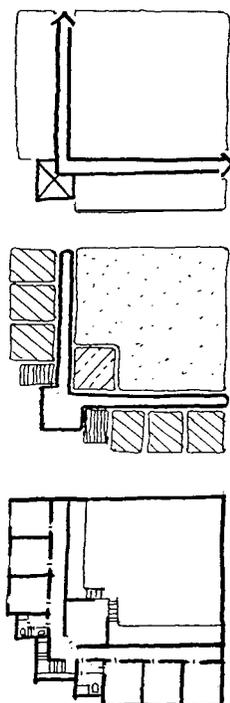


Fig. 3. Transformation from the abstract to the concrete.

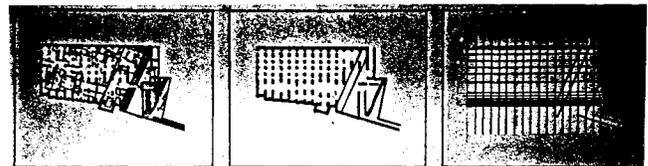


Fig. 5. Structural analysis, by Andy Gutierrez.

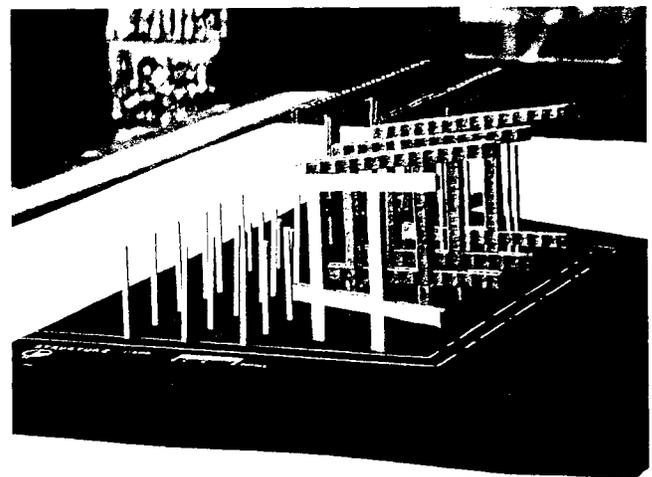


Fig. 6. Structure model for a museum, by Alec Suresh Perera.

able to generate many alternatives without worrying too much about the outcome, and without losing sight in the details of what is to be done in the whole.

CRITICAL EVACUATION

Although it is merely the second semester since inception, a number of questions have come up through our attempts to critically evaluate this sequence of courses.

First and most crucial: Is the view of architecture as synthesis exclusively correct? There is a danger that by offering an explicit and definite statement about architecture, the faculty members will convey a sense of handing down exclusive truth to the students, and as a result, confine the students' exploration and suppress their creativity. The intention of the courses, however, is not to be dogmatic about this concept about design, and once recognized this danger can be easily avoided. By involving the students directly in the analysis of cases, the faculty have an opportunity to encourage discussion and consideration of multifarious ways of understanding architectural design. Faculty have an obligation to keep in mind that in this type of course, an answer that is singular and absolute is not as productive as a question that allows a serious exploration.

Another potential problem: If the students are not capable of reaching an understanding of architectural design by doing in the studio, which we seem to admit, then how can we say that the same students are capable of abstracting from the particulars of a given case? If they cannot, then they will fail to see the relevance of case studies to the studio projects simply because the case's program, place, and time are different from those of the studio project. Or on the contrary the students might take the studio projects to be a mere reproduction of case studies and seek to apply directly the particulars without a making an examination of differences or a creative interpretation of the case. In this sense, the nature of architectural case studies, in contradistinction to case studies in the natural or social sciences, has to be understood by the students. While a case in other fields may

generally be taken as something from which a rule is immediately induced (for example — I observe that the insects I have seen have six legs, therefore I hypothesize that any insect has six legs), an architectural case does not yield such an immediate result but instead requires creativity when applied to a new set of conditions.

Having had its initiation in economic rather than pedagogical concerns, the new sequence of case study courses has nevertheless shown some definite potential for improving the teaching of architectural design. That potential appears to be transferable to institutions where the economy of teaching may not be such a pressing concern.

A recent article in a prominent professional magazine indicated that the architectural education has failed to prepare its graduates for the profession.⁴ Although this may well be the case, it should not be taken for granted that the profession is the absolute normative for the education. Especially under the contemporary conditions the education may serve better by keeping its distance from the profession. The education should be, before that of a professional architect, that of an architect and of an intellect who is equipped with the ability to respond meaningfully to the changing world. After all, the demands that the university presses may be a springboard for reforming architectural education for the better.

NOTES

- ¹ Robert Gutman, *Architectural Practice: A Critical View* (New York: Princeton Architectural Press, 1988).
- ² Charles C. Bonwell and James A. Eison, *Active Learning: Creating Excitement in the Classroom* ASHE-ERIC Higher Education Report No. 1, 1991 (Washington, D.C.: The George Washington University, School of Education and Human Development, 1991).
- ³ James H. Bunn, *The Dimensionality of Signs, Tools, and Models: An Introduction* (Bloomington: Indiana University Press, 1981).
- ⁴ "The Schools: How They're Failing the Profession," in *Progressive Architecture* (September 1995), pp. 47-51, 94, 96).