

# A Beginner's Mind

**PROCEEDINGS  
21st National Conference  
on the Beginning Design Student**

**Stephen Temple, editor**

**Conference held at the  
College of Architecture  
The University of Texas at San Antonio  
24-26 February 2005**

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Situating Beginnings  
Questioning Representation  
Alternative Educations  
Abstractions and Conceptions  
Developing Beginnings  
Pedagogical Constructions  
Primary Contexts  
Informing Beginnings  
Educational Pedagogies  
Analog / Digital Beginnings  
Curriculum and Continuity  
Interdisciplinary Curricula  
Beginnings  
Design / Build  
Cultural Pluralities  
Contentions  
Revisions  
Projections

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## Design/Build: Full-Scale Learning

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The involvement of a beginning design student in a design/build project makes pedagogical sense. In the context of an architecture curriculum, the design/build problem fundamentally works as a didactic tool. The design/build process permits an effective conflation of pedagogical and professional frameworks for the beginning design student to observe, experience, and affect. Most importantly, the process involves the student in an essential manner of acquiring knowledge and skills.

*1. The architect should be equipped with knowledge of many branches of study and varied kinds of learning, for it is by his judgment that all work done by the other arts is put to the test. This knowledge is the child of practice and theory. Practice is the continuous and regular exercise of employment where manual work is done with any necessary material according to the design of a drawing. Theory, on the other hand, is the ability to demonstrate and explain the productions of dexterity on the principles of proportion.*

*2. It follows, therefore, that architects who have aimed at acquiring manual skill without scholarship have never been able to reach a position of authority to correspond to their pains, while those who relied only upon theories and scholarship were obviously hunting the shadow, not the substance. But those who have a thorough knowledge of both, like men armed at all points, have the sooner attained their object and carried authority with them.*

*The Ten Books on Architecture* by Vitruvius  
Translated by Morris Morgan, 1960

Since the summer term of 1997 at the Taubman College of Architecture + Urban Planning and as of the fall term of 2004 at the University of Virginia, School of Architecture I have had a series of opportunities to contextualize the teaching of construction practices in a series of vertically integrated design-build studios, seminars, and independent studies. The design/build component of an architecture curriculum presents a vital way of extending and augmenting principles, practices, and the administration of construction through full-scale design problems.

There are a number of pedagogical concepts and practices that the design/build problem makes possible:

### **Active Feedback**

The design/build problem unavoidably involves a process of *active feedback*. The notion of *active feedback*, at the heart of all constructional processes, describes the constant cycling of information between idea as speculation and execution as enterprise. *Active feedback* also describes the exchange of information as the transference of 'know-how' (one source of knowledge) between teacher and student. Working side-by-side, a student and instructor establish a "dialogue" *through* the work and not *outside* the work - it is tangibly immediate. A productive and instructive *active feedback* loop is made most effective by providing clear

instructions, rigorous supervision, and timely demonstrations. In addition, the student experiences the process of trial-and-error, understands the margin of error, and is held accountable for the tolerance of time and material. The notion of *active feedback* is most apparent when the student experiences material resistances and opportunities – material sources, management, manipulation, adaptation, and reconstitution all factor into the decision-making design process.

### **Reflection-in-action**

The design/build problem promotes the notion of *reflection-in-action* described by Donald Schön in his book *The Design Studio*. The context of a design/build problem coupled with the assistance of the instructor affords the student numerous opportunities to be critical, to be decisive (however erroneous at times), and, in turn, to be reflective in the act of *making*. Additionally, the process involving *reflection-in-action* promotes responsiveness, on the part of the student, to skill development – new and established, material sensibilities, and attention to methodological and performative aspects of fabrication.

*“... reflection-in-action is not at war with the instrumental problem-solving that we are used to associating with professional competence. Rather, reflection-in-action on the problematic situation at hand may convert “messes” into well-informed problems to which research-based techniques can be applied.”*

*The Design Studio* by Donald Schön, (pp. 27 – 28)

*“... the ways in which thought may be exercised, or expressed in, the activities of making things have very largely to do with how the maker relates his thought and his actions to, on the one hand, his materials and on the other to the object itself that he is making. The latter, while importantly an “object” in the sense of being a “thing” is at the same time “the object of” his activity, but, of course, the materials of which that thing will, if the maker is successful be made, will also be “objects of” his attention in his activity of making.”*

*Making & Thinking* by Andrew Harrison (p. 18)

### **Research ± Application**

Managed properly, the design/build problem sets up a strong link between the finding of information and the implementation of information. The student understands research as the application of found information in service of making informed design decisions. Material specifications, performances, and costs are considered simultaneously with spatial, morphological, and constructional strategies. The information gathered from the internet, product brochures, code manuals, and conversations with manufacturing sales representatives is folded into the design process and the student begins to learn how to coordinate the multiplicity of variables that make up the design problem. Through this experience the student has the opportunity to reflect and react critically to the information – consistent discussions with the instructor across details, material samples/specifications, and cost estimates asks the student to argue the viability of one solution over others. This form of argumentation is essential for the student to see how decisions are affected by down-stream variables and effect up-stream possibilities.

### **Graduated study ≈ Accelerated learning**

Building up a knowledge base and fundamental skill sets is best achieved through synchronic and graduated assignments. As the exercises build in sophistication through synchronization, *learning* accelerates.

*“Is not, by its very nature, any subject, history, a modern language, physics, algebra just what we mean by a ‘study’? Conventionally and traditionally it is. But study and a study are different things. A study has come to justify just a definitely aggregated body of subject-matter isolated from others and treated as a unit by itself. But study is studying. The physician may study ‘medicine’ in the medical school, but in practice he studies many other things, such as his patient and how to succeed. [ ... ] A similar duplicity is found in the word ‘learning.’ It signifies an accumulated and transmitted body of knowledge, and it also signifies the acts of apprehending, understanding, and retaining in and for subsequent use.*

*In this difference of meanings within the terms ‘study’ and learning’ is implicit the point I wish to make. The titles we find in a school program, such as history, geography, algebra, botany, assume that learning is already at hand, set in proper summaries and needing only to be divided into proper doses. They assume that this material which is unified through its isolation from other things is the natural occasion for the act of studying. This assumption has broken down through the expansion of knowledge and modes of expert skill; this breakdown has caused the immense variation in actual subject-matter which has come about even when the nominal titles remain the same. The content changes; titles persist. The persistence of names is of little account. What is important is that segregation also persists.”*

*The Way Out of Educational Confusion* by John Dewey, (pp. 12 – 14)

The design/build problem is a study in collaboration. Coordination and sequencing are emphasized consistently throughout the process and the student understands the architectural design problem as an integration of a variety of trades, types of expertise, and experiences. The design student doesn't work in isolation from other members and facets of the project, on the contrary, the student is charged with a set of responsibilities that fundamentally entail seeking out multiple variables of a problem and to begin making viable connections between such variables. The student quickly realizes that a successful solution requires, not only a firm knowledge of the constituency of variables and factors, but more interestingly, an awareness and command of their inter-dependencies. Processes of synchronization and coordination also challenge the student to develop sound communication skills – particularly when asked to argue as advocate of possible solutions in a meeting with multiple interested parties – client, code official, colleagues, and instructor. Conviction and accountability is required of the student in such a circumstance and the method of representation (drawing, model, prototype, and/or specifications) is emphasized as the vehicle of the proposition. This demands rigor and familiarity of the overall design/build project. It is important to note that this experience is one that requires a gradual introduction of the student to such a dynamic, and at times, confrontational situation, on the part of the instructor – I invite the student should become increasingly involved in meetings and discussions allowing for layers of confidence and knowledge to grow with the range of their observations and experiences. The student's thoughtful presence is singularly the most important aspect of this experience. It is the instructor's responsibility to gradually and judiciously prepare the student for this degree of involvement by assigning responsibilities while offering encouragement through empowerment.

### **Fabrication atelier**

The projects I have executed over the last eight years have assumed a great range and complexity of scale, scope, and cost and have successfully involved students from all years of

study and levels of construction experience. I see the design/build program as a modern day 'fabrication atelier.' The notion of the 'apprenticeship' is very much a part of the daily process and involves a great deal of tutelage. It is also very important to promote those students with more maturity and experience to the role of assistant instructors – vertical integration ensures a network of instructions. Everyone learns from everyone. When everyone commits to the act of problem-solving, different approaches and experiences begin to produce multiple awarrences – even in the most experienced student. In turn, the fabrication process highlights the viability of one idea over another while the beginning design student witnesses and affects the progress or relapse of an idea. Moreover, the 'fabrication atelier' should consistently promote rigorous and disciplined making as all involved are held accountable for the quality of the end product.

### **Middle-out**

The University of Michigan clients have included the Taubman College of Architecture + Urban Planning on two occasions, the School of Art & Design, the School of Public Health, the Information Technologies Central Services Department, and the Michigan League, a division of the University of Michigan Unions. Currently, the University of Virginia and Charlottesville clients and projects include the Architecture School, the Newcomb Hall Theater, lounge, and student center, a theater for virtual reality for The Institute for Advanced Technology in the Humanities, the new UVa Digital Collaboratorium at the UVa Foundation North Fork Research Park, the Italian, Spanish, and Portuguese Department, and the Charlottesville Live Arts Center. Although most of these projects begin within the insular walls of the University, they quickly expand out into the surrounding community. It is essential for the beginning design student to develop first-hand relationships with local community fabricators, trades, and subcontractors. It challenges the student to understand and take part in their community – however temporary. The design/build problem gives the student a salient opportunity to contribute and influence their own physical space while leaving the place they found a better place when the leave. Bureaucracy challenges all involved – from the administration to local businesses – to engage each other. All the relative dynamics between institutional, commercial, pedagogical, professional, industrial, and artisanal entities are literally brought to the table in a discussion and in service of a common goal – it is important for the design student to witness this exchange and to learn how to contribute to it in a positive way.

### **Disciplined practice**

Factors and requirements concerning material specifications, structural efficiencies, and code requirements affect the design process in real time and as a result of actual budgetary constraints. I see these aspects of the design/build problem as an invaluable venue in which students can participate and affect the relationships between theory, research, technology, construction, and practice. I ask the student to be critical and to explore new modes of production while questioning our practice as a set of historical and conventional parameters. The design/build problem promotes the necessary collaboration and coordination between disciplines – architects, artists, designers, engineers, material scientists, manufacturers, and artisans – and makes it a fundamental part of the student's educational experience.

*"The scholastic and the actual now almost sustain an inverse ration to each other. If we take a glance at only the titles of the latter we come upon many which are designated with hyphens: astro-physics, bio-chemistry, and so on. And there are many more where an adjective is prefixed to the noun that names the old subject-matter, such as physiological chemistry, physiological psychology, physical chemistry, etc. These names also testify to the breaking down of dividing walls between subjects.*

*“What has been said about the interdependence in branches of knowledge holds equally well in those technical activities of use of knowledge that we call industrial or practical arts. In operation they are often immensely specialized in detail. But back of the operations there lies a concentration of knowledge derived from many sources, an integration of many processes which originated in separate arts. Consider the multiplicity of problems that have to be met by a city architect, problems not just of building, but of lighting, heating, plumbing, ventilation, elevator service, perhaps electric power, decoration, and so on. The individual architect may not be master of them all but he has to know enough to coordinate the activities of specialists in these departments. The illustration is typical of what goes on in every modern factory.”*

*The Way Out of Educational Confusion* by John Dewey, (pp. 16 – 17)

The hard work and unwavering dedication of many individuals from different facets of the University of Michigan, the University of Virginia, and the Charlottesville community who participated and continue to participate in these projects make the design/build experience possible. All the projects offer invaluable lessons; above all, the process teaches us as educators and students – at all stages of learning – builders and users that the desire to improve our physical environment beyond commonly accepted and expected standards may, at times, be confronted with adversity. And, this very pursuit often generates a great deal of self satisfaction and enjoyment. Clearly, the challenges and promises that continually surface throughout the design/build process are in themselves a reward and a source of inspiration and learning. The design/build pedagogical model is ultimately a highly demonstrable agent in teaching the complexities, nuances, and discipline of our profession to the beginning design student.

*“Competence in practice, as we are increasingly coming to see, demands a marriage between problem-setting and problem-solving.”*

*The Design Studio* by Donald Schön