



*Donald A. Schön*



Educating the  
Reflective Practitioner



Jossey-Bass Publishers • San Francisco

EDUCATING THE REFLECTIVE PRACTITIONER  
*Toward a New Design for Teaching and Learning in the Professions*  
by Donald A. Schön

Copyright © 1987 by: Jossey-Bass Inc., Publishers  
350 Sansome Street  
San Francisco, California 94104

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher.

**Library of Congress Cataloging-in-Publication Data**

Schön, Donald A.  
Educating the reflective practitioner.

(Jossey-Bass higher education series)

Bibliography: p. 345

Includes index.

1. Professional education. 2. College teaching.  
3. Experiential learning. 4. Educational innovations.

I. Title. II. Series

LC1059.S45 1986 378'.013 86-45626

ISBN 1-55542-220-9 (alk. paper)

Printed in the United States of America on acid-free recycled paper containing a minimum 50 percent recovered waste paper, of which at least 10 percent is postconsumer waste.

COVER DESIGN BY VICTOR ICHIOKA

In the story of Dani and Michal in Chapter Six, "Dani" refers to Daniel Gat of the Department of Architecture at the Technion, in Haifa, Israel. "Michal" is Michal Solfer, now a practicing architect, who was a student of Professor Gat's at the time of this story. Professor Gat presented this case study in 1983 during an academic workshop at the Technion at which I was a guest participant. I am very grateful both to him and to Ms. Solfer.

FIRST EDITION  
PB Printing 10

Code 9024

Jossey-Bass Web site: <http://www.josseybass.com>



*The Jossey-Bass  
Higher Education Series*

When coach and student coordinate demonstrating and imitating, telling and listening, each component process fills gaps of meaning inherent in the other. The coach's demonstrations and self-descriptions, the student's efforts at performance and self-descriptions, the comparisons of process and product, provide material for reciprocal reflection-in-action. Learning and coaching to design become experiments in the work of designing and in communication about design.

When experimentation generates new problems, puzzles, and confusions, these, too, can become material for reciprocal reflection. Communicative dead ends can yield to movement up or down the ladder of reflection.

For both student and coach, effective search for convergence of meaning depends on learning to become proficient at the practice of the practicum—and this may seem to imply a vicious learning circle. The coach must learn ways of showing and telling matched to the peculiar qualities of the student before him, learn how to read her particular difficulties and potentials from her efforts at performance, and discover and test what she makes of his interventions. The student must learn operative listening, reflective imitation, reflection on her own knowing-in-action, and the coach's meanings.

Does it not seem that she must be capable of reflecting-in-action in order to learn to reflect-in-action? But the reflection-in-action essential to the practice of the practicum is not the same as the reflection-in-action essential to designing. Students bring to the studio, in greater or lesser degree, generic competences for communication, experimentation, and imitation on which they can build, in dialogue with the coach, in order to learn to do the cognitive work of learning to design.

It is not enough, however, for student and coach to have these competences; they must also choose to exercise them, adopting a kind of stance toward each other that we shall explore in the next chapter.

## Chapter Six

# How the Teaching and Learning Processes Can Go Wrong

In this chapter, I shall examine some of the contextual features on which the success of the dialogue of student and coach may depend: the stances adopted by the two parties toward their joint effort at communication, the theories-in-use they bring to their patterns of interaction, and the qualities of the behavioral world they create for each other. I shall show how these features are interrelated and how they can facilitate or hinder the work of reciprocal reflection-in-action.

### Stance

Some studio masters feel a need to protect their special artistry. Fearing that students may misunderstand, misuse, or misappropriate it, these instructors tend, sometimes unconsciously, under the guise of teaching, to actually withhold what they know. Some students feel threatened by the studio master's aura of expertise and respond to their learning predicament by becoming defensive. Under the guise of learning, they actually protect themselves against learning anything new.

When either party sees and feels about the studio situation in this way, he or she can spoil the search for convergence of meaning. That party's *stance* toward the interaction impedes the exercise and development of competences for reciprocal reflection-in-action. Indeed, one might think of "stance" as itself a kind of competence, since it involves not only attitudes and feelings but ways of perceiving and understanding. At the very least, we should

"If I imitate you, I give up my right to govern myself."

Such inhibitions seem linked to our idea of being grown up, which we conceive in terms of independence, freedom of choice, and fully vested selfhood. They are also linked to an ideology of education that advocates thinking for oneself (consider the withering epithet "Copycat!"). But inhibitions against the *idea* of imitation are very much at odds with the almost universal *practice* of imitation. Students in American culture, especially those fresh from an experience of adolescent rebellion, are likely to be profoundly ambivalent toward imitation, despising it in theory but embracing it in practice.

It is possible that this ambivalence is a phenomenon peculiar to certain national, or even class, cultures. In my experience, students from Far Eastern countries seem to be unconflicted about imitation; they expect to imitate their teachers and may be disconcerted by the prospect of doing anything else. Even in the United States, an apprentice machinist usually learns his trade by imitating just what he sees the master machinist do.

In any case, the willingness to imitate is a willingness to put oneself, at least for a while, in a position associated with a child's dependent role. Given the ambivalence of many students toward imitation, they may be willing to enter into that role only at the price of hiding from themselves the fact that they are doing so. Their ambivalence may drive them paradoxically, toward imitation of the blindly mechanical variety. Reflective imitation demands, on the contrary, a willingness to do as the studio master is doing and, at the same time, reflect on what one does. Consciously entering into the master's way of designing, the student adds to her range of possible performance and extends her freedom of choice.

There is a student in Quist's studio—we shall call her Johanna\*—who, in all the respects outlined above, manifests to a very high degree a stance conducive to reciprocal reflection-in-

\*"Johanna," like "Judith" and "Northover," "Quist" and "Perra," is a fictitious name assigned by Roger Simmonds to a participant in the design studio he observed.

recognize stance, in this sense, as a condition for the acquisition of competence: being willing to try something is a condition for acquiring an ability to do it.

Let us begin, then, by considering how the student's stance toward studio experience can impede or facilitate her self-education in design.

Earlier, concerning the willing suspension of disbelief, we noted that the student is called on to plunge into the experience of the studio without really knowing what it will entail. She is asked to let go of earlier understandings and know-how, along with the sense of control and confidence that accompanies them. She is expected to experience confusion and puzzlement. She is asked to trust the studio master and become temporarily dependent on him, while still retaining a sense of responsibility for self-education.

Once she has entered into an initial contract with the studio master, the demands on her do not come to an end. She must be willing to try out his approach to designing and conduct an active search for the essential meanings of his instructions and demonstrations, even when these conflict with her own prior understandings. In order to discover how her existing tacit knowledge conflicts with what she wishes to learn, she must be willing to reflect on it.

When it comes to the studio master's demonstration, she is asked to take up a stance of reflective imitation—even though she is very likely to feel an abhorrence of imitation, especially if she belongs to a culture (like the American one) that espouses independence of thought and action. Negative feelings toward imitation may take any of the following forms:

"I do not want to become dependent on you; I want to preserve my own identity."

"I do not want to give up my freedom of action; I don't like to be constrained by you."

"If I imitate you, I accept your authority and become your subordinate."

"If I imitate you, I lose my originality; I merely reproduce your actions without real feeling or understanding of my own."

action. Of all the students in that studio, she seems uniquely gifted with a capacity to learn from her interactions with Quist, and she is regarded by students and faculty alike as the best designer in the group.

Faced with the very conditions that drive some students to desperation and leave others with the feeling that they are caught in a Kafkaesque guessing game, Johanna describes Quist's instructions as "top notch." She seems, from the very beginning, to have grasped something that remains elusive to the others.

Quist is a strong advocate of a particular approach to designing. All the students react, in one way or another, to his powerful presence. All of them are, at least in some measure, afraid of it. But Johanna, alone among the students, reflects on her own ambivalence toward Quist. In one of her interviews, she offers the following comments:

In a way, I completely trusted Quist's judgment, and worried about it. But in looking at it now, he doesn't work that way—he works with your own ideas and never imposes his own except in the most positive way of helping you to extend and see the implications of your own ideas. I don't think we are getting that doctrinaire a line. But in a way, it is laziness. You want a quicker way to get there. *I feel that even if someone is very dominant now, I will always be able to undo it later.* I feel many of the best people learned in that old Beaux Arts tradition where they got a very authoritarian line but later were able to get out of it.

Her words recall Quist's,

You should begin with a discipline, even if it is arbitrary . . . you can always break it open later.

Just as Quist points out that designing depends on an initial imposition of an order which one can always break open later, so

Johanna accepts her initial dependence on an authoritative structure of meaning imposed by another because she feels confident that she will always be able to undo it later. She can will the suspension of disbelief in Quist's approach and also the suspension of her earlier beliefs, because she feels confident of her ability to evaluate it *once she has understood it*, to look back on it, and to break it apart. She can relinquish control for a time and leave the direction of her development open-ended because she feels confident in her ability to control the larger process that includes this temporary loss of control.

Similarly, Johanna reveals in her notebooks a preoccupation with the twin issues of freedom and discipline, issues central to the predicament in which she finds herself. She is conscious of the paradoxical requirement that she give up freedom, in designing as in learning, in order to gain the freedom that comes with new levels of understanding and control.

Freedom is discipline—the step beyond progressive education . . . freedom *from* something is not freedom.

She is articulate about the oscillations, implicit in Quist's view of designing, between commitment and detachment.

These are paradoxes and need a dual response, one simultaneously of detachment and commitment, the freedom of the first *allowing* the second.

Her ability to hold her ideas "loosely" gives her the freedom to perceive, compare, and coordinate many different meanings and sets the stage for an eventual commitment based on richer understanding.

Her attitude toward the entire studio experience, as she describes in her notebooks, shows up more concretely in her account of her approach to a particular task, the design of the school. Here, she begins with the idea that there must be a "skeleton, a core that all else nods to":

The experience of the spine must be varied, must be exciting, must be sequential, must have climax, must be able to be used for other purposes, must sort out circulation activities, must have surprises and not give itself away. Direction is from top to bottom—must be a clue to the whole building.

She concerns herself with the relation of this core idea to the site:

I went back to the site after the first idea and there was no way in which I could put it there. It is a totally wooded area, a beautiful area. People were using it just to walk in. . . . I said, "There must be some reason I can justify putting it there." Then I decided that that was the point when an architect has to say no! At base, it was wrong.

When her first idea collides with her respect for what is valuable in the site, she is able to let that idea go.

The germ for her second idea comes as she draws the contours for the new location—

The contours coming in on the north side close together hit the building broadside and, when released through the stretched area of the building, are looser, freer.

The spine remains but no longer as the dominant theme. In the new idea, classroom walls are at right angles to the changing direction of slope, their angles determined by the slope. Of her new approach, she says,

Nestled into the hill—change in levels—home bases centered around resource center at angle to allow access to outside—positioned to get morning sun from the east.

Johanna is able to entertain multiple perspectives on a new experience with the confidence that she will be able, later, to choose among them and to coordinate them. In the studio as a whole, as in a particular design task, she can accept an initial discipline, confident that she will be able to break it open later. She can make an initial, as-if commitment to a point of view—her own or Quist's—and, later, distance herself from it. Her capacity to hold ideas loosely is a kind of "disciplined freedom," a "detached commitment."

If Johanna feels relatively little anxiety at the prospect of temporarily relinquishing control to Quist, it is because she has confidence in her own capacity to entertain, compare, coordinate, and restructure her own meanings. If she is not frightened by a temporary surrender of independence as she enters into Quist's view, it is because she can articulate to herself the cognitive work she can and must do and the situational predicament within which it must be done.

Quist's stance toward Johanna is, at least as she perceives it, very well matched to her own. He is prepared to advocate and demonstrate his view of designing. He is also prepared, as she says, to avoid imposing his own ideas on her. He is willing, as his dialogue with Petra shows, to reflect on his own designing. He says, in the interview quoted in Chapter Four, that he is open to the student's challenge and confrontations. We have seen how, in his dialogue with Petra, Quist does not reach out to test the impact of his words or actions on her. With Johanna, however, Quist's failure to test what the student makes of his interventions seems to have little or no negative effect. Her willingness to try to enter into his way of seeing things and her active search for his meanings seem to be sufficient to enable her to make very effective use of Quist for her self-education in designing.

#### Behavioral Worlds and Learning Kinds

Other students in Quist's studio—more than a few of them—profess to find Quist problematic, threatening, and domineering. They have difficulty in learning anything from him. These are students who do not initially share the complex of

attitudes that enables Johanna, in interaction with Quist, to make the experience of learning productive. One of these students, Judith, exhibits an initial stance that is in many ways the opposite of Johanna's.

Judith comes to the studio already armed with a strongly held view of architecture. What is required, she believes, is "a technology through which the user becomes largely the creator of his or her own environment." She recognizes only one programmatic need, namely, "flexibility . . . and that has no formal implications." Not surprisingly, her teachers find her work wanting; they accuse her of failing to think architecturally. But Judith is well defended. She construes her disagreements with her teachers as ideological ones; the teachers are simply on the wrong side of the fence.

They've had their day in court, they can't handle the problem anymore . . . Their buildings can't be adapted to future use. . . .

Because they believe in universals, they ignore the client. They even say so. They also ignore the user for the same reason.

Thus, Judith refuses to enter into a willing suspension of disbelief in her teachers' perspective and of belief in her own. Instead, she sees herself as a partisan who must engage her teachers in combat.

As she enters the studio, Judith could be described as confronting, partisan, defensive, ideological, and frozen in her own view. But this is her *initial* stance. What happens to her as the studio unfolds?

What happens to her is recorded, painfully, in the protocol of her dialogue with Northover, one of Quist's assistants—a dialogue typical of her interactions with her instructors. Like Petra's dialogue with Quist, this is a desk crit, and it occurs at about the same stage of her work on the problem of the school. It reveals a process of systematic miscommunication. Not only do the two parties fail to achieve convergence of meaning, each fails almost completely to understand what the other is talking about. And the process by which they fail shows how a student's initially

resistant and defensive stance and a complementary stance by the instructor lead both parties to create a behavioral world (an interrelated context that shapes their views of their own and the other's actions) in which it is impossible for either to break through their mutual misunderstanding. They create for each other what I shall call a "learning bind."

Judith begins the dialogue with a comment on her plans for siting the school:

*Judith:* I haven't decided yet whether it's going to be sited right here or right here—I have the feeling it's going to be here and I'm going to make it level.

She describes the choice of site as a matter of "feeling," as though to say, "If I feel it's right, then it is!"

*Northover:* Do you have this to a large scale somewhere?

From our experience of other instances in which studio masters ask this question, we can infer that Northover asks for a scale drawing because he believes it to be essential to design experimentation. At this point, however, he does not state the thought behind his question.

*J:* Not right now, no. But it works as far as southern orientation—being far enough from here so I don't get drainage problems, being near enough to this flat area so I can set up playgrounds. . . .

*N:* So you don't have it on a site plan at all!

Judith shows her awareness of some of the norms relevant to siting the school, but Northover does not respond to these. He focuses on her omission of a site plan, again without saying why that omission is crucial. At this point, Judith launches into a long defense of her approach to the problem:

*J:* No, that didn't seem necessary, because it will be flat. I've concerned myself with the building. We've talked about the whole notion of progressive and experimental schools, and I've stayed with this decagon shape because it really is appropriate for the number of classrooms I need. . . . Also you have fewer windows and less surface area, so that I am conserving energy.

But let me start with the plans . . . the main entrance would be over here . . . when you walk in, there are administration and health offices—there is this long lobby for exhibits—this leads through to the gym—I'm going to put seating in here and a stage here. Here is a ramp which spirals up. The classrooms begin here, and every portion of the decagon goes up two feet. . . . It begins with the kindergarten and preschool areas—across from this is the rest of their play area plugged under the spiral, which has risen to sixteen feet by then. I took an acoustics class last term, and I'm designing this so that it will be very nice acoustically.

She has decided that the decagon will do, because it fits the number of classrooms and conserves energy. She has hit on a shape for the building as a whole, a spiral, and has found a way to plug in the necessary spaces. Elsewhere, she calls her spiral a "Guggenheim."

She seems to have a very sparse repertoire of features drawn from a few design domains. She says, in effect, "If I have *some* feature on which to make a decision, then I'm OK!" But she is unaware of this sparseness. She seems not to know that there are *many* relevant domains, nor does she know how to draw out the consequences and implications of her moves across multiple domains.

Northover asks where the next floor plan is. Judith replies that she has not thought it necessary to make one. She proposes to put "art and cafeteria" on the main level and asks whether he

thinks this a good idea. He says, "That is possible, I guess." Then he asks about level changes and circulation. "Most people will use the ramp," she hopes.

*N:* Why do you want this stepping up?

*J:* Well, when I visited open schools, the one thing they complained about was the warehouse quality—of being able to see for miles. It would visually and acoustically break up the volume.

Again she has in mind one norm, building character, and one problem, "warehouse quality."

*N:* I think you have got to really discipline yourself to draw it up to scale and draw a section through it—let's just assume that these ramps do work, that access—if so, this ramp will cut off the views to and from the library.

That is, "You cannot really tell whether the ramp solution to circulation will work or whether you have solved the problem of warehouse quality until you draw it to scale and in section. And you must accept the discipline of doing it." Northover then gives her an example of a flaw in her design which she might discover by means of this discipline.

*J:* No, this ramp is really just a porch.

*N:* Yes, but it has a thickness which must be considered. It is difficult to read, you really need a section.

*J:* No, I need a model.

*N:* No, a section will really be sufficient.

*J:* But do you understand it even if it is poorly drawn?

*N:* Why was the gym left out of the whole schema?



She intends the ramp to be just a porch, to have no thickness that needs worrying about, but Northover points out that it will be thick whether she wants it to or not. She might discover this through a sectional drawing, but she may not know how to do such a drawing. In any case, she takes Northover's comments as a criticism of her drawing, yet it is clear that she sees drawing not as thought-experimenting but as a way of presenting ideas.

Northover seems to be saying, "You are not really designing at all. You are simply having 'ideas' and putting them down on paper. The moves you make have consequences that are testable, but you must draw to scale and in section in order to test them. The whole process of designing is lost to you because you will not do these things."

Judith, in contrast, thinks of designing in terms of simple shapes like the decagon or the spiral, which will allow users the freedom to construct their own forms. At most, such shapes need to be coupled with attention to such considerations as acoustics, energy conservation, or avoidance of warehouse quality. A basic idea, once discovered, can be decided on once and for all, and it can always be made to work. It is as though Judith understood the notion of arbitrary imposition of a geometry but not the discovery and testing of its consequences.

Judith and Northover bring to their dialogue two widely discrepant models of designing. The main difference between them is not the conflict over "form" versus "user participation"; it is, rather, that Judith simply has no idea what Northover means by drawing, conceived as a process of trying out design moves and discovering their consequences and implications. Nor does she grasp what he means by "knowing what something will look like." Similarly, Northover seems to have an inadequate picture of the perspectives and priorities Judith brings to her task and the image of designing that informs her responses.

If Judith wanted to discover the meaning of Northover's criticisms, she would have to focus on the gaps and mistakes he points out, trying to construct and test for herself the model of designing that makes these stand out for him. But she is very far from wanting to do this work. On the contrary, she sees the crit as a new battle in her continuing war with her teachers. She tries to

ward off Northover's criticisms, which she sees as attacks, by getting him to admit that he understands and likes her big idea. To this end, she adopts several strategies. She brushes aside his probing questions, and when Northover points out a mistake he cannot help noticing, she dismisses it by making a perfunctory admission of error.

*J:* Once you are there, the whole thing is at the same level.

*N:* No, it's not, because there is a level change here.

*J:* OK, you're right.

At other times, she clings tenaciously to her view in spite of everything Northover can say to the contrary.

*N:* Don't you feel there were other rooms that didn't fit also—rooms that needed to define their own shape?

*J:* Well, I don't find the system that restrictive.

*N:* It is true of the classrooms, I won't argue, but what about other spaces? You say everything is possible but don't give reasons.

*J:* No, it's possible—it works, it really does.

She does not inquire into the basis for his questions and criticisms, nor does she seek to reflect on or test her own assertions. When she occasionally seems to be asking for criticism, her words suggest that it is really approval she wants:

*J:* What I need to know is what you feel about the scheme. Is it too complex?—I think it's fairly simple as a school.

With increasing desperation, she ignores Northover's questions and bids for his approbation. Yet she does not express her feelings

directly, nor does she surface her view of this interaction as an episode in her continuing ideological struggle with Northover.

Northover, meanwhile, follows a strategy of “mystery and mastery.” He asks many questions—“Where is the next floor plan?” “At what elevation is that?” “What is the main circulation system?” “How do you get from here to there?”—but keeps to himself the meanings underlying his questions. From time to time, he puts her answers together in his mind and comes up with a negative attribution, which he springs on her:

So you don't have it on a site plan at all!

And from time to time, he advocates what he thinks she should do:

I think you have got to really discipline yourself to draw it up to scale.

But he does not connect such prescriptions to the view of designing from which they flow.

Northover does not invite Judith's inquiry into his meanings, nor does he inquire into hers. He does not respond to her increasingly urgent bids for approval:

*J:* But do you understand it even if it is poorly drawn?

*N:* Why was the gym left out of the whole schema?

It may be that throughout the dialogue he feels caught in a dilemma that he voices only at the end—that he would like to respond to her questions but cannot do so because she is so far from having presented him with a scheme that makes her ideas understandable. And when he finally expresses that dilemma, he seems mostly to be trying to soften the blow:

*N:* I'm not saying that you should be discouraged but that you should do more detailed work—the reason I can't give strong opinions is that I honestly can't feel what it will look like yet.

Judith and Northover seem to be playing a kind of game in which they drive each other round in circles.

Judith presents her grand scheme, for which she seeks Northover's understanding and approval. Northover sends out questions, criticisms, and prescriptions, all aimed at getting Judith to realize that she has not been designing at all. She perceives these interventions as attacks. She defends against them. She returns with increasing desperation to her own objective. Northover pursues his point, telling her that she must draw, she must really work it out in detail, until he seems to be afraid that he may have demoralized her completely. At this point, he tells her not to be discouraged.

Within their game of attack and defense, both Judith and Northover fail to notice that they have missed each other's meaning. Judith thinks the idea is there in the drawing; Northover says he can't feel what it will look like. He tells her to draw; she takes him to mean that she presents her ideas poorly. What he means, however, is that, without drawing in detail and to scale, she cannot experiment to discover the consequences of her moves. Judith pleads for his reactions to her idea; for Northover, there is as yet no idea.

If Judith were aware that Northover means something very different by designing than she does, she would find his meaning mysterious. Northover, who seems to think she shares his view of designing, regards her refusal to make detailed scale drawings as a sign of sheer stubbornness. He must feel frustrated because he cannot get her to carry out elementary design procedures. For Judith, the skirmish with Northover must reinforce her sense that she is engaged in an ideological battle with all her teachers.

Each of them constructs views of designing, meanings of key terms, and interpretations of the entire interaction that are incongruent with the views, meanings, and interpretations held by the other—and both seem unaware of this fact. The possibility of reciprocal work toward convergence of meaning depends on their discovering their present incongruity. But this they are unlikely to do, for each of them perceives the interaction as a conflict rather than as a failure of understanding. Nor is the game of attack and defense conducive, for either of them, to reciprocal reflection.

Later in the year, Judith will succumb to what she regards as superior force. As she says in an interview,

After a particularly aggressive session with Quist . . . [I decided that] I must give my critics what they want.

But from the background of her experiences in the studio, she will not be able to understand what her critics mean when they say what they want, much less give it to them. She will try to lay on "metaphors," "scale drawings," and "formal functions." But since she has never grasped the meaning of these elements within Quist's view of designing, she will succeed only in grafting them onto what her critics regard as a nondesign. She will not be able to produce anything they can accept as architecture.

If we consider the dialogue of Judith and Northover from the point of view of the general conceptual issues that it raises, we can describe their process as one in which student and instructor succeed in creating a behavioral world in which the learning predicament becomes a learning bind. Moreover, as they create their behavioral world, they employ a shared pattern of behavior toward each other.

Judith's initial stance, toward the studio in general and this interaction in particular, is combative, hostile, rigid, and defensive. Yet she also wants something from her interaction with Northover: appreciation for what she has done. Thus, she seeks both to defend herself against his "attacks" and to secure his approval. From this point of view, we can describe the interpersonal theory of action—the values, strategies, and underlying assumptions—that she brings to the dialogue. She seeks to achieve her objective—defense of herself, appreciation for her accomplishments—as *she* defines it; she does not seek out Northover's goals for the interaction. She sees herself as involved in a win/lose game that she tries to win through strategies of unilateral control and defense—brushing aside questions she does not wish to answer, clinging tenaciously to her position, asking for criticisms in such a way as to elicit approval. At the same time, she tries to avoid the negative consequences of winning. She withholds her negative

feelings—she does not accuse Northover of the hostility that, in a private interview, she attributes to all her teachers. She preserves a surface of cool reason. She appears to ask real questions, she gives some justification for her positions, and when Northover drives her into a corner with his arguments, she gives in to him in a perfunctory way.

Northover employs a very similar theory-in-use. He, too, has an objective for the interaction: to get Judith to see the inadequacy of her design and carry out (his view of) the fundamental procedures of good designing. He tries to achieve this objective unilaterally; he does not try to understand what she may want from the interaction. He, too, sees himself as involved in a win/lose game, and he tries to win. He seeks unilaterally to control the dialogue, shifting from one target of opportunity to another. He asks questions to which he already knows the answers ("Don't you feel there were other rooms that didn't fit also?"), uses argumentation to convince her of his position, tries to drive her into corners. At the same time, he withholds the intellectual basis of his questions and the negative feelings—irritation and frustration—that he is very likely experiencing. Finally, when he says, "I'm not saying you should be discouraged" and "I honestly can't feel what it will look like yet," he tries to soften the negative effects of his efforts to penetrate her defenses and win the argument.

The theory-in-use that Judith and Northover share conforms to a model of interpersonal theories of action that Chris Argyris and I have called Model I (Argyris and Schön, 1974). It is a model of unilateral control, win/lose strategies of mystery and mastery, withholding of negative feelings, and surface rationality. It is a model in which individuals make negative attributions to others which they test only in the privacy of their own minds—never publicly, out loud, with the other person.

When the parties to a pattern of interactions sustain Model I theories-in-use, they tend to create a certain kind of behavioral world, that is, a certain kind of communicative context which they perceive as reality. This is a win/lose world in which defensiveness and unilateral self-protection are the norms. Characteristically, however, within this world each perceives the other, and not himself, as defensive and as unilaterally bent on winning. It is a

model in which each tends to see himself as caught in a dilemma, which he keeps to himself; negative attributions about the other are not publicly tested but are simply taken at face value. It is also a model of mutual deception, in which each party tries to win, exercise control, penetrate the other's defenses, while preserving an impression of cool rationality and concern for the other's feelings.

Such a behavioral world inhibits reflection—and therefore learning—at several levels. When each party is caught up in an effort to achieve his own objectives and win at the other's expense, he is unlikely to reflect on his underlying value assumptions, invite the other's challenges, test what the other makes of his utterances, or surface the dilemmas he experiences. Each participant constructs meanings for the interaction that inhibit reciprocal reflection. Neither one seeks out information that could disconfirm his view of the other or strives to make his assumptions confrontable by the other.

The meshing of these theories-in-use produces a behavioral world within which it is not possible to isolate troublesome phenomena so as to discover and juxtapose the different descriptions that each participant would construct for those phenomena. Rather, each party strives to persuade the other or to fend off the other's attacks. Each strives to impose his or her way of seeing on the other rather than enter the other's world so as to understand vicariously how a statement previously opaque could seem an explanation. Each demonstrates for the other the very norms and strategies (private testing and judging, suppression of feelings that might signal openness to inquiry, unilateral self-protection by speaking in inferred categories far removed from directly observable data) that are likely to keep their win/lose game from surfacing as an object of shared inquiry. Hence the behavioral world of the interaction becomes, for all practical purposes, self-sealing—a disease that prevents its own cure.

Judith and Northover are as unlikely to reflect on their incongruent views of designing as on their miscommunications. Far from being willing to suspend her disbelief in Northover's view of designing, Judith persists in fending off his attacks, at the same time pleading for his approval. It does not occur to her to explore his view of designing. She thinks she knows what it is; and

in any case, she could not do so without seeming to make herself vulnerable in a battle she is determined to win. Northover cannot explore her understandings of his statements as long as he strives only to convince her of her mistakes, nor can he invite her confrontation of him or engage her in reflection on their dialogue without making himself vulnerable.

Here, student and studio master create for each other a behavioral world in which the learning predicament becomes a learning bind: Judith, locked into a view of designing from which she cannot discover what Northover thinks she needs to learn; Northover, locked into a mode of interaction in which he cannot help her discover it. They are stalemated at the lowest level of the ladder of reflection.

### Unbinding

Although the case of Judith and Northover is certainly extreme, it is by no means unique. Any student's learning predicament can easily become a learning bind.

The potentials for this transformation are present in every design studio. Communication about designing is always subject to the impediments of ambiguity, vagueness, and inexpressibility. The understandings of student and instructor are always initially more or less incongruent. Under these circumstances, miscommunication is highly probable. Its correction depends on student's and studio master's being able and willing to search actively for convergence of meaning through a dialogue of reciprocal reflection-in-action. But this depends, in turn, on the creation of a behavioral world conducive to such a dialogue, and several factors may work against its creation. The student's early experience of loss of control, competence, and confidence—always present to some degree—can readily produce a sense of vulnerability that leads the student to become defensive. And the instructor may respond to the student's defensiveness, as Northover did, by strategies of unilateral control that increase defensiveness and reduce the chances for reciprocal reflection. Then the stage is set for a win/lose game. Once such a game has begun, moreover, the participants' Model I theories-in-use are likely to keep it going.

If the instructor tries to maintain unilateral control of the dialogue and the student resists him, then in the ensuing rounds of attack and defense it is unlikely that either party will stop to reflect on his or her own meaning or inquire into the other's. If the instructor tries to maintain unilateral control of the dialogue and the student submits to him, then it becomes difficult for the student to make a public test of her own understandings or explore the instructor's meanings, for this might undermine his unilateral control. If a student is confused and unable to articulate her confusion, then she needs to be helped to see that questions are possible and encouraged to ask them; but such encouragement is incompatible with a theory-in-use like Northover's that is based on mystery and mastery.

Once a learning bind is created, the search for convergence of meaning requires that student and studio master try to enter not only into each other's way of seeing design but into each other's ways of framing the interaction in which they are engaged. Northover would have to reflect on his way of designing and on Judith's, on his way of framing the interaction and on her's. And she would have to do likewise. They would have to test their reflections by on-the-spot experiments that would be impossible unless each could get valid information from the other. Judith would have to be able to tell Northover how she was seeing her interaction with him and how she understood the meaning of his questions and criticisms; Northover would have to be able to do the same for her.

These, then, are some of the elements of reciprocal reflection-in-action essential to unbinding a learning bind:

- Focus of attention on the present interaction as an object of reflection in its own right.
- Getting in touch with and describing one's own largely tacit knowing-in-action.
- Reflection on the other's understandings of the substantive material that the instructor wants to convey and the student wants to learn.
- Testing what one has understood of the other's knowing-in-

action and framing of the interaction; testing what the other has made of one's own attempts at communication.

- Reflection on the interpersonal theories-in-use brought to the communicative process.

In effect, student and studio master would have to extend their ladder of reflection, adding to it a "rung" of reflection on their own interaction, their behavioral world, and the theories-in-use by which they create and sustain it. They would have recourse to this level of reflection when things were not working and were locked in at the lower levels.

But in order to participate in this process, the student must already be able to get in touch with and describe her own intuitive understandings and enter into the studio master's, both in the domain of designing and in the domain of her interaction with the master. She must be able to put aside what she knows in order to enter into the as yet unknown world of someone else, to experience a zone of uncertainty where, having given up for the moment her usual ways of seeing, she is still unconnected to the other's ways of seeing. For this, she needs a capacity for cognitive risktaking. Rarely, a student—like Johanna—brings to the studio the strong sense of self on which this capacity depends. For most students, the wish to avoid uncertainty, coupled either to a win/lose theory-in-use or to an unreflective deference to the instructor's authority, makes it impossible to participate in such a process. A demand that they do so would place them in a vicious learning circle—asking them to exhibit, in order to learn, that which they most need to learn.

Responsibility for initiating a breaking of the learning bind must lie, in the first instance, with the instructor, who is presumably better equipped to do what the student cannot as yet do.

Let us explore, for example, how Northover might have dealt differently with Judith. What might he have done? And what competences would he have needed in order to do it?

Suppose Northover were to surface at the beginning of the interaction the dilemma he suggests at the very end,

The reason I can't give strong opinions is that I honestly can't feel what it will look like yet.

If he were to do this, he would begin from a position that might (in a win/lose context) be perceived as one of weakness. He would start now from his inability to respond, but in a way that invites a question of the following kind:

What do I have to do so that you can feel what it will look like?

The way would then be paved for Northover to describe what he means by a design idea or, better yet, to demonstrate, starting from a feature of Judith's approach, how by "drawing in scale" she might evolve a design idea.

If he were to start by surfacing a dilemma he feels, Northover would be encouraging Judith to explore his meanings rather than only clinging to her own. And Judith's exploration would increase the likelihood that Northover would open up for her inspection the system of understandings and know-how essential to his view of designing.

Or we can imagine a different approach that might take off from the ending of the dialogue we have already read. Northover might say something like:

This discussion leaves me frustrated and worried. Frustrated, because I don't think I'm helping you get at what lies behind my judgments and advice. Worried, because I may have discouraged you. I'd like to know whether these things are true.

Northover's expression of these feelings might encourage Judith to express her own feelings of anger and frustration at having been unable to get through to Northover or to pry out of him some appreciation of her work. His public reflection on their dialogue might encourage Judith to surface her own perception of it as a battle. The way would then be open for any of several lines of inquiry. Northover might say, for example,

It may be, as you say, that you attach more importance than I to the user's changing needs and less importance than I to the formal qualities of the building. But it seems to me that I haven't communicated or you haven't grasped what I mean by designing—even where the designer puts highest priority on use of the building.

He might then describe to Judith some of the things that lead him to this inference, asking for her agreement or disagreement. If Judith were to agree that she does not grasp what he means by designing, he might then propose that she join him in exploring an example of a design process in which considerations of building use and flexibility are joined to norms drawn from other design domains. Or, if she were to disagree, he might ask her to show him, in relation to her own drawings, what she means by designing. Or again, he might ask her to make explicit, by description and illustration, how her own understanding of designing differs from his.

Each of these interventions suggest a theory-in-use very different from the one Judith and Northover illustrate in the actual dialogue. The interactions I have suggested emphasize surfacing private attributions for public testing, giving directly observable data for one's judgments, revealing the private dilemmas with which one is grappling, actively exploring the other's meaning, and inviting the other's confrontation of one's own. These are elements of the interpersonal theory of action that Chris Argyris and I have described as Model II (Argyris and Schön, 1974). Its values, as we have described it, are those of valid information, free and informed choice, and internal (rather than externally generated) commitment. Its strategies include advocacy of one's views and interests coupled with inquiry into the views and interests of others. It is a theory-in-use built on a recognition of the fact that in every statement of ours we convey a twofold message. There is, first of all, the message conveyed directly—for example, "Let us test whether we have understood each other." But there is also the message conveyed by the theory-in-use that, intentionally or unintentionally, we model for each other. Students share with all

human brings a great capacity for attention to messages at both levels and, especially, to their incongruity. If Northover were to espouse the reciprocal testing of meanings—even uttering sentences like the ones I have suggested—but were, at the same time, to convey to Judith a sense that this was simply a new stratagem for “winning,” then she would be likely to pick up and play back to him, not the theory of action he espoused, but the tacit intention he conveyed.

In order to be able to recast his approach to interaction with Judith along the lines I have proposed, Northover would have to make a significant change in his theory-in-use, one that would cause him both to reflect on what he does in interactions like this one and to become proficient at inventing and producing alternatives to it. Not only would this require a new sort of reflection-in-action, it would also very likely require help from someone else.

In Chapter Ten I will discuss such transformations and the help appropriate to them. At this point, it is perhaps sufficient to observe that Northover is caught, at least for the time being, in a learning circle of his own—unable to engage Judith in reflection on their stalemated interaction because he is as yet unable to reflect on and restructure the theory-in-use he brings to it.

### The Story of Dani and Michal

This discussion should not end with the impression that there is only one right approach to the learning predicament and the learning binds that may result from it. I believe, on the contrary, that there are many possibly effective approaches. Each of these makes special demands on its proponents; it suits some participants and learning contexts and not others. Counterintuitive as it may seem, for example, students may respond positively and openly to the basketball coach who yells at them mercilessly—but yells at *everyone*, under the same predictable conditions.

The story of Dani and Michal illustrates an approach very different from Quist's or Northover's or my suggested alternative to Northover's. The story was told and discussed at a workshop on the design studio, held at the School of Architecture and Planning at the Technion, in Israel, in November 1983. Dani, a practicing

architect and studio master, had asked Michal, who had been a first-year student of his eight years before, to be present. In addition to Dani, participants at the workshop included several members of the architecture faculty and me.

I shall begin by telling the story in the words of Dani and Michal—their initial descriptions of the events and their responses to questions asked along the way.

*Dani:* I recalled the work that Michal Z. did when she was a first-year student, eight years ago. Even though it has been a long time since then, I remember the events and the feel of the project pretty well. I was teaching, and . . . it was “Introduction to Design,” your first semester in the Technion. . . .

In any case, I suddenly remembered this event, which was very unusual for me. Toward the end of the semester, I saw Michal was struggling with her work, and her project did not look at all like this [refers to drawings on the wall]. I asked her to show me her work, and I saw something like this [draws]—some buildings . . . and a corridor and rooms. It was uninspired, institutionalized, and the whole thing looked a little like a motel. I did not like it, but I did not say so. I just asked Michal if she liked what she was doing.

*Participant:* What was she supposed to design here?

*Dani:* I forgot to mention that—a field school. Maybe Michal should continue from here.

*Michal:* First of all, there were three projects in the semester, and this was the third and last one. We had about a month, and the subject was living quarters in a field school.

What else would you like me to say?

*Dani:* Whatever seems important to you.

*Michal:* The evening before the session with Dani,

I remember thinking, This is not what I want. It really looked like what Dani drew over there.

There were also some buildings that I tried to have winding with the topography, or something like that. One story. And I remember that on the previous evening I more or less came to the conclusion by myself that I wanted something else. I could even define what I wanted.

Now Dani, in the session the next day, was supposed to instruct us what to prepare for the presentation, how to draft, etc. It was the last session a week before the end of the semester. I remember we even spoke about the elevation—I want such and such a type of windows and I don't want it to be symmetrical, or I do want it to be symmetrical, etc. We spoke about what to draw and how to build the model. And then he asked, "What do you think? Do you like it? What do you feel about it?" Then I was able to tell him the truth, that it really was not at all what I wanted and that, actually, I wanted . . . three things. . . .

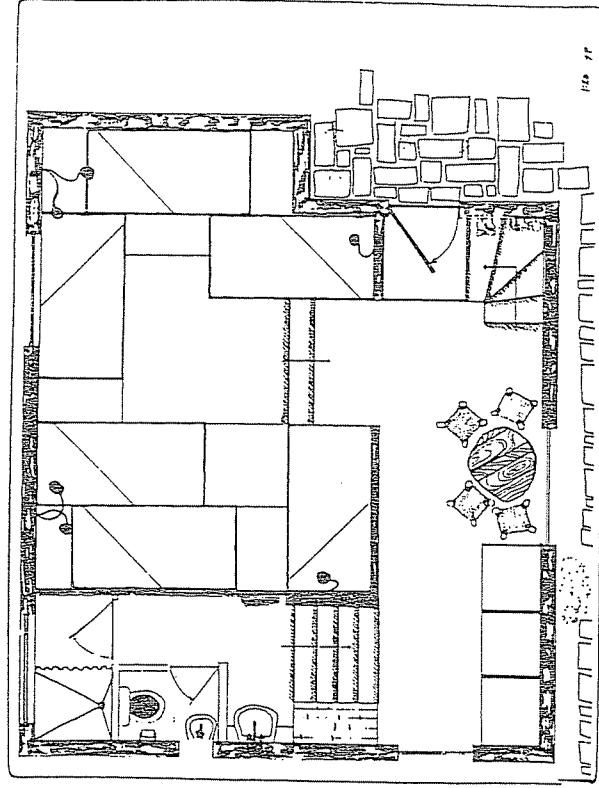
First, I said, if it is a field school, then the "field" comes before the "school," before the house. I want nature to be dominant. I also told him, I want it to be a social experience for the groups that visit the field school. Usually classes visit and the kids all know each other, and I want it to be a social experience for them. And the third thing is, I want it to be a place that will develop their senses—that will sensitize them to changes, to feel. An unknown place will make you more aware of everything.

So Dani said to me, "Look, the semester is over already. But don't give up. Maybe during the vacation you will be able to do what you wanted. If you do, come to me and show me what you did." We spoke about how, maybe during the vacation, I would sit down and try to accomplish what I wanted. But the same evening, I came home and sat down and

did it. That evening, I was very focused and I finished the building layout.

The next day, I came to Dani and said, "Look, I did this." Oh!—there is another important stage. When I told him the three things I wanted, he took a pen and started to sketch, "Maybe this way . . . or that." He very freely went over all kinds of possibilities, various designs. I think he made a kind of jump, and from that stage it was only [a little way] to the stage where it was really possible to actualize it [Figure 2]. . . .

Figure 2. Plan of Building in Field School.



*Dani:* . . . We tried to clarify how to go about doing all that. How to make it hidden, what is the meaning of a "social experience." . . . Could you tell a bit about the social experience, some events or scenarios of social experience that were later expressed in your work?



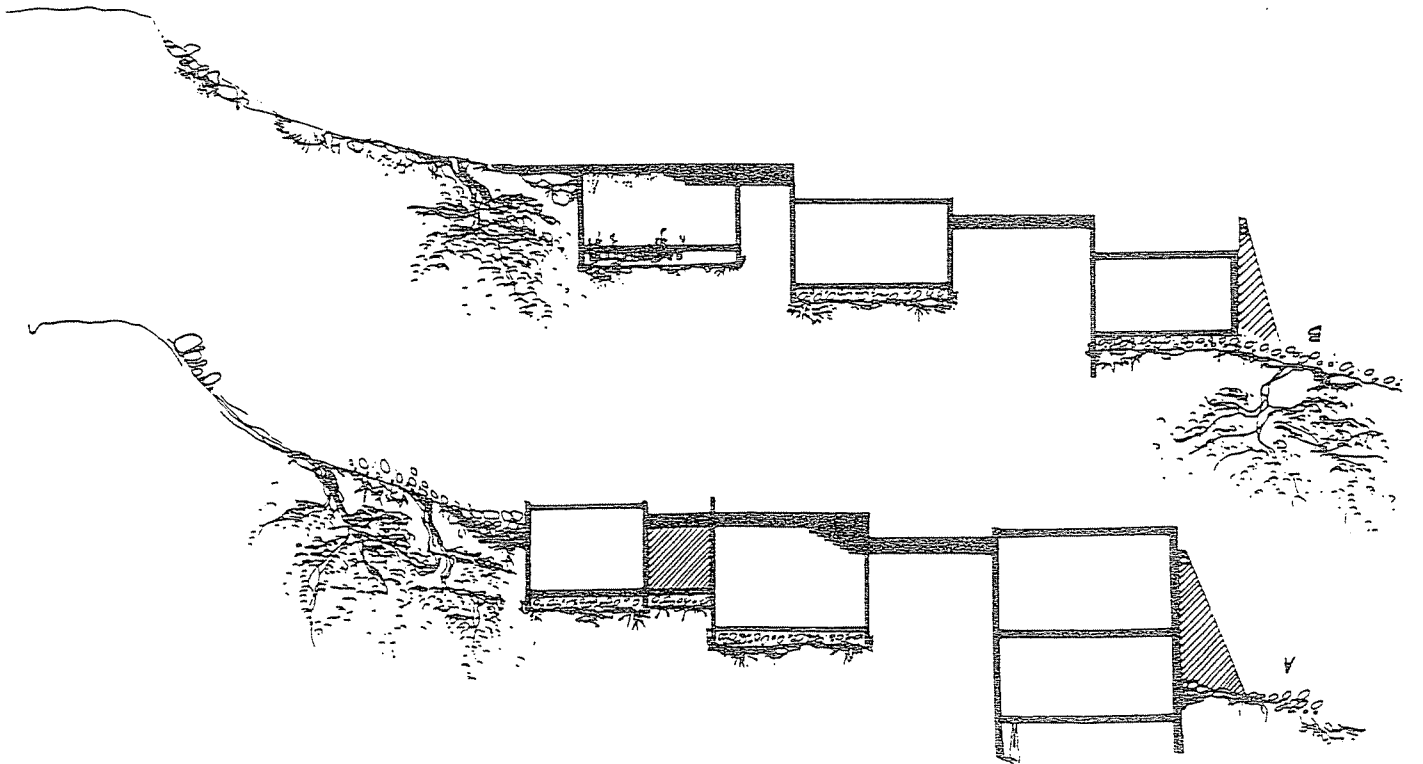
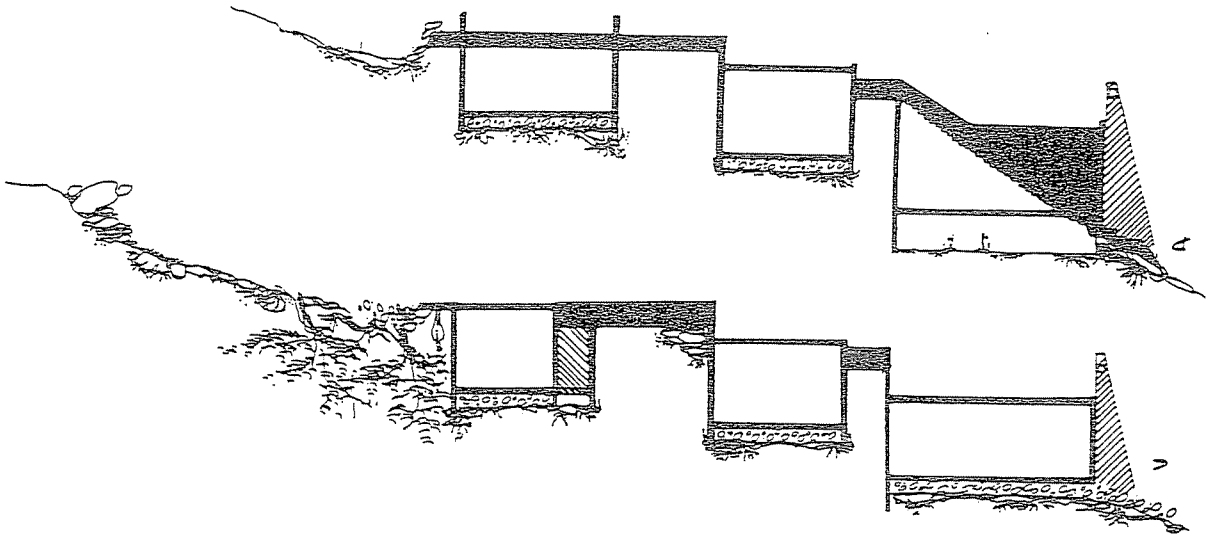


Figure 3. Elevations of Field School.

*Michal:* I don't remember all the details.

*Dani:* I remember. For example, you should be able to enter the room without exactly being inside. That is, to peek in, see who is in there, and be able to decide to join or not after you have seen what and who is in there. You can see if it is your gang that is in there, what they are doing, if you feel like joining them, etc. . . . I remember there was also something about surprises—chance meetings that could take place where people's paths cross. . . .

*Michal:* I remember another thing. I wanted to give excuses to people to look into and enter all kinds of rooms that they would not ordinarily enter because it was not theirs. I remember excuses to wander around, different reasons to come to a certain spot. . . .

*Dani:* What did we say about "hidden"? How did you do it? Could you tell about it or draw it?

*Michal:* I remember in general . . . all kinds of little sections, views from above to down below, views that disappear and then reappear. . . .

*Dani:* We see that your section [Figure 3] is as if it is continuing the hill.

*Michal:* I wanted people to approach the site without seeing that there is a building there. Only when they are actually there should they realize they are there. That was the idea. . . . My concept was that you come to a field school for the experience of nature. So you should not see a building, that is what you see all the time. You should walk through the trees and suddenly you see that this is the field school. This is the field and you are inside. . . .

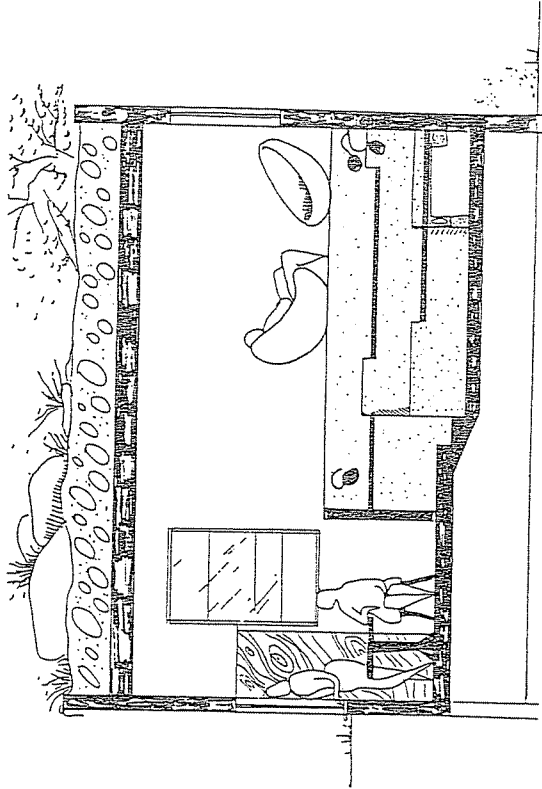
*Dani:* How is the concept "experience in nature" expressed?

*Michal:* I tried to keep all the vegetation and I had a problem with wide margins. You have to see how

to get back to the trees from all this dug-out, built-up area. That bothered me very much and I thought about it a lot. . . .

*Dani:* I see there, in the second section from the right [Figure 4], someone is standing near the table, with one arm stretched outside. I can't get into your head, but I'd interpret that as part of the experience of nature. It is very varied. In some places, we see nature framed in a kind of window. In another place, you can touch it. In another place, you can go out into it.

Figure 4. Section of Room in Field School.



*Michal:* Also, different things can be seen from different heights. When you are on the lower level, you face the lower part. And if you are above, you see far into the distance. . . .

Later in the session Michal described how she had conceived of her *first* solution:

*Michal:* You can put it another way. I thought of what was wanted of me.

*Participant:* What do you mean by "wanted"?

*Michal:* It could have been satisfied, if I knew exactly what was wanted.

*Participant:* What did you feel was wanted from you?

*Michal:* A proper solution—it should be convenient, cheap. . . . I remember I had a problem of symmetry because of the WC that, in the front, was not so nice, etc. And I had this problem we were talking about, this elevation. . . .

Perhaps the most striking feature of this story is the vividness and enthusiasm with which student and coach tell it, even though they are eight years removed from the event. Now a practicing architect, Michal has saved the drawings from her first-semester design studio. She is able to tell in considerable detail what happened to her, what she thought and did, what Dani said, and how she reacted. Dani seems to remember the events in even greater detail than Michal does ("very unusual for me," he notes). Clearly, the event was important for both of them. What makes it so memorable?

Michal had been struggling with the field school project and had produced something neither she nor Dani liked. Dani calls it "uninspired, institutionalized, . . . a little like a motel" (earlier, he had described it as like "three bananas on a field"). Dani did not tell her his opinion of her design, but significantly, she guessed what he thought anyway. She herself decided the night before their session that "this is not what I want." The first critical moment seems to have been Dani's question, "What do you think? Do you like it? What do you feel about it?"

This seems to have come as a shock to Michal. It was true that she knew her design was not what she wanted and that she had already considered what she did want. But she had framed the situation as one in which *her* likes or dislikes were of little account. Rather, she had asked, "What was wanted of me?" She

had tried to guess exactly what was wanted and felt she knew the answer: a "proper solution"—convenient, cheap, something much like what she had first drawn.

Dani at first "related to the project," talking with her about elevations, windows, symmetry. But then his question "Do you like it?" broke this frame. Surprised and relieved by his question (I think), Michal was able to tell him the truth, that it was not at all what she wanted, and she then described the three qualities she would have liked in her field school: nature should be dominant (the school should be "hidden in nature," as Dani later put it); the school should be a "social experience" for the groups of kids who visited it; and it should be a "place that will develop their senses."

Impressed by the clarity and conciseness of her description of the qualities she wanted to produce, Dani first of all told her "not to give up." Then he sat down with her, took a pen, and began to sketch. Later, Michal described what he did as "doodling":

He made small sections and spoke and showed little schemes. That opened up all the physical possibilities for me.

Michal experienced what he did as a "kind of jump" to the stage at which she felt "it was really possible to actualize it." In his drawing, he "opened up possibilities," showing her *many ways* of producing the qualities she desired.

Energized by this opening up of possibilities and perhaps also by Dani's encouragement to actually go ahead and make what she liked, Michal went home, and that very evening ("very focused," as she says), she finished the building layout.

From the richness and enthusiasm with which Michal described the results of her work, it is clear that she still likes what she had done—even at a distance of eight years. Later, Dani stated explicitly what he liked about it:

I began to see that all of the parts were answering those possibilities that she defined. I was really pleased with those results, in that respect.

The story of the field school is a story of learning to design as experimentation in producing what one likes. In this process, the coach's functions are several:

- First, to ask what the student wants the project to be, thereby legitimating her own preferences and intentions—indeed, conveying the message that her personal preferences *ought* to be expressed and used to guide her design.
- Then, to encourage her to try to produce what she likes, demonstrating in quick sketches different ways she might do so, “opening up the possibilities.” It is important here that Dani suggests many ways—not one best way—to achieve the effects Michal wants. He does not instruct her in the best way to do it; he works with her to open up a range of possible means for her experimentation.
- Finally, to judge the results of her work in terms of her effectiveness in “realizing those qualities she defined.”

Dani presents Michal with an opportunity to learn how to practice, where “practice” is conceived as exploration and testing of alternative means of producing the qualities of product she finds appealing. She is invited to attend to her own appreciative judgments, surfacing preferences she might otherwise ignore or suppress.

Dani communicates, implicitly, that Michal should impose her own coherence on the design situation. So she makes the situation coherent by willing for her field school the three qualities of integration in nature, social experience, and development of the senses. She also unlearns, at least in this instance, her habit of dependence on a view of “proper solutions” that she has invested, heretofore, with the full authority of the school of architecture she attended.

In the same process by which Dani encourages Michal to produce what she likes, he guides her through a discipline in which appreciation regulates experimentation. Implicitly, he leads her to see the kind of objectivity achievable in a practice experiment—a kind that is dependent on her subjective preferences: she

can judge for herself, independent of mere opinion, whether she has succeeded in realizing the qualities she says she wants.

Dani teaches “technique” here by demonstrating many alternative means of producing the desired qualities. Implicitly, again, he conveys the message that technique is to be learned through experiments that try out and evaluate alternative means of production. At the same time, Michal seems to learn here to observe in a finer-grained, more differentiated way. She seems, for example, to have learned the value of incorporating into the house a variety of ways of connecting with the natural surroundings, enabling the dweller to move from one such connection to another.

Taking all these functions together, it seems correct to say that Michal is being initiated into a process of self-education in designing, a process in which she is exposed both to an image of architectural practice and to an image of “practice” as a form of self-directed experimentation.

Dani seems here to have entered into a kind of contract with Michal, one that differs from Quist’s request that the student “suspend disbelief.” The elements of this contract seem to be as follows:

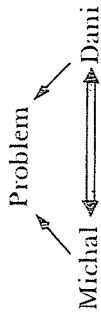
You should step into the situation, advocating the qualities you want to produce; I will accept your preferences, without trying to impose my own on you.

You must become an experimenter, testing out alternative ways of achieving your goal.

I will become your coexperimenter, helping you figure out how to do what you want, demonstrating for you how you might achieve your goals.

You must judge your work—and I will join you in judging it—on the basis of your success in producing what you intend.

This contract creates an interpersonal situation in which Michal and Dani sit, as it were, side by side, as coexperimenters, before the shared problem of producing the qualities Michal prefers:



Sitting next to Michal in the presence of a shared problem that originates in her intentions, Dani escapes the dilemma of how to convey negative information to her without triggering her defenses. Information that might otherwise be seen as negative can now be seen, realistically, as helpful to her efforts to achieve her goals.

Dani has created with Michal a situation in which he does not have to struggle with her to get her to share his view of her designing, nor does he have to cope (privately or publicly) with the frustration he feels because his legitimate criticisms are interpreted by the student as personal attacks. He has framed his interaction with her in a different way. He has succeeded in getting her to declare her own preferences; he has joined her in the task of realizing those preferences; he has framed the shared problem as one of experimentation in producing what she likes; and he has defined his own role in that process as one of opening up new possibilities for action.

### Conclusion

The possible outcomes of the studio experience are as varied as the possible evolutions of the learning predicament. The student must educate herself to design but can do so only through interactions with a studio master. Depending on the quality of their search for convergence of meaning—on the stance and theories-in-use that both parties bring to that process—the student's learning career is likely to unfold in one direction or another.

When student and studio master are in a learning bind, so that some of the essential elements of designing are frozen in miscommunication, and neither student nor studio master is able to initiate reflection on that process, then any of several unsatisfactory outcomes is likely. The student may become a *content learner*, like Judith, refusing to suspend disbelief or to enter into her

teachers' views of designing—except to “give them what they want.” Or the student may *overlearn* the studio master's message, construing it as a set of expert procedures to be followed mechanically in each situation. She may take as a general rule, for example, what the studio master conceives only as a limited illustration of a more complex idea. Such a student may develop a *closed-system vocabulary*,\* in which she can state the studio master's principles while performing in a manner incongruent with them and remaining unaware of that fact.

In contrast, a student like Johanna, with the kind of stance and competence she brings to her interactions with Quist and Northover, can succeed in listening actively and imitating reflectively, building up an extraordinary grasp of the essentials of their approaches to designing. Quist's and Northover's apparent disinclination to reflect on their interpersonal theories-in-use is no obstacle to Johanna, because of what she *brings* to the studio. But it is manifestly an insuperable obstacle to Judith. Between Judith and Johanna there are many shades and varieties of possible learning outcomes.

The story of Dani and Michal illustrates another kind of learning outcome and another approach to dilemmas rooted in the learning predicament. At Dani's instigation, he and Michal become coexperimenters in the task of producing qualities Michal has set as goals for herself. Student and coach reframe their interaction, thereby reducing the likelihood of falling into the kind of win/lose game that Judith and Northover play. But avoiding or dissolving a learning bind is itself a problem of experimentation. There are, as I have observed, many possibly effective approaches to it. In order to test any one of them, however, coach and student depend on reciprocal reflection-in-action and on the construction of a behavioral world conducive to it.

I have limited my discussions in this chapter to the interactions of student and studio master. I have not so far discussed the many ways in which the particular qualities of a studio milieu or the culture of the school in which it exists can

\*I have borrowed this phrase from Jeanne Bamberger.

influence both the probability that learning binds will occur and the ways they are likely to be dealt with. In this respect, as in others, the institutional context of the school is critically important to the creation and conduct of a reflective practicum. Chapter Eleven will take up these questions.

## Chapter Seven

# Using a Reflective Practicum to Develop Professional Skills

In this chapter I draw from my observations of architectural design studios the general outline of a reflective practicum—an idea whose application to education for artistry in other fields of practice will be the subject of Parts Three and Four.

Designing, both in its narrower architectural sense and in the broader sense in which all professional practice is designlike, must be learned by doing. However much students may learn about designing from lectures or readings, there is a substantial component of design competence—indeed, the heart of it—that they cannot learn in this way. A designlike practice is learnable but is not teachable by classroom methods. And when students are helped to learn to design, the interventions most useful to them are more like coaching than teaching—as in a reflective practicum.

### Why Designing Cannot Be Taught

Design professionals such as architects and urban designers, along with practitioners of such professions as law, management, teaching, and engineering, deal often with uncertainty, uniqueness, and conflict. The nonroutine situations of practice are at least partly indeterminate and must somehow be made coherent. Skillful practitioners learn to conduct frame experiments in which they impose a kind of coherence on messy situations and thereby discover consequences and implications of their chosen frames. From time to time, their efforts to give order to a situation provoke unexpected outcomes—“back talk” that gives the situation a new



## References

- Ackoff, R. "The Future of Operational Research Is Past." *Journal of Operational Research Society*, 1979, 30 (2), 93-104.
- Alexander, C. *Notes Toward a Synthesis of Form*. Cambridge, Mass.: Harvard University Press, 1968.
- Arendt, H. *The Life of the Mind*. Vol. 1: *Thinking*. San Diego, Calif.: Harcourt Brace Jovanovich, 1971.
- Argyris, C. *Increasing Leadership Effectiveness*. New York: Wiley, 1976.
- Argyris, C. *Reasoning, Learning, and Action: Individual and Organizational*. San Francisco: Jossey-Bass, 1982.
- Argyris, C., and Schön, D. A. *Theory in Practice: Increasing Professional Effectiveness*. San Francisco: Jossey-Bass, 1974.
- Argyris, C., and Schön, D. A. *Organizational Learning*. Reading, Mass.: Addison-Wesley, 1978.
- Bamberger, J., and Duckworth, E. "The Teacher Project: Final Report to the National Institutes of Education." Massachusetts Institute of Technology, 1979. (Mimeographed.)
- Barnard, C. *The Functions of the Executive*. Cambridge, Mass.: Harvard University Press, 1968. (Originally published 1938.)
- Brooks, H. "Dilemmas of Engineering Education." *IEEE Spectrum*, Feb. 1967, pp. 89-91.
- Coleridge, S. T. *Biographia Literaria*. (J. Engell and W. J. Bates, eds.) Princeton, N.J.: Princeton University Press, 1983. (Originally published 1817.)
- Delbanco, N. *The Beaux Arts Trio*. New York: William Morrow, 1985.
- Dewey, J. *Logic: The Theory of Inquiry*. New York: Holt, Rinehart and Winston, 1938.

- Dewey, J. *John Dewey on Education: Selected Writings*. (R. D. Archambault, ed.) Chicago: University of Chicago Press, 1974.
- Dewey, J., and Bentley, A. F. *Knowing and the Known*. Boston: Beacon Press, 1949.
- Erikson, E. H. "The Nature of Clinical Evidence in Psychoanalysis." In D. Lerner (ed.), *Evidence and Inference*. New York: Free Press, 1959.
- Freud, S. "Constructions in Analysis." In J. Strachey (ed. and trans.), *The Complete Psychoanalytical Works of Sigmund Freud*. Vol. 23. New York: Norton, 1976. (Originally published 1937.)
- Glazer, N. "The Schools of the Minor Professions." *Minerva*, 1974, 12 (3), 346-363.
- Goodman, N. *Ways of World Making*. Indianapolis: Hackett, 1978.
- Gusfield, J. "Buddy, Can You Paradigm? The Crisis of Theory in the Welfare State." *Pacific Sociological Review*, 1979, 22 (1), 3-22.
- Havens, L. *Approaches to the Mind: Movement of the Psychiatric Schools from Sects Toward Science*. Boston: Little, Brown, 1973.
- Hughes, E. "The Study of Occupations." In R. K. Merton, L. Broom, and L. S. Cottrell, Jr. (eds.), *Sociology Today*. New York: Basic Books, 1959.
- Illich, I. *A Celebration of Awareness: A Call for Institutional Revolution*. New York: Doubleday, 1970.
- Kassirer, J., and Gorry, G. A. "Clinical Problem-Solving: A Behavioral Analysis." *Annals of Internal Medicine*, 1970, 89, 245-255.
- Kuhn, T. S. *The Essential Tension: Selected Studies in Scientific Tradition and Change*. Chicago: University of Chicago Press, 1977.
- Lindblom, C. E., and Cohen, D. K. *Usable Knowledge: Social Science and Social Problem-Solving*. New Haven, Conn.: Yale University Press, 1979.
- Lynnton, E. "Universities in Crisis." Unpublished memorandum, Boston, 1984.
- Lynnton, E. *The Missing Connection Between Business and the Universities*. New York: McGraw-Hill, 1985.

- Mill, J. S. *A System of Logic*. London: Longmans, Green, 1949. (Originally published 1843.)
- Piaget, J. *Play, Dreams and Imitation*. New York: Norton, 1962.
- Plato. *The Meno*. (W.K.C. Guthrie, trans.) London: Penguin Books, 1956.
- Polanyi, M. *The Tacit Dimension*. New York: Doubleday, 1967.
- Reddy, M. "The Conduit Metaphor: A Case of Frame-Conflict in Our Language About Language." In A. Ortony (ed.), *Metaphor and Thought*. Cambridge: Cambridge University Press, 1979.
- Reichenbach, H. *The Rise of Scientific Philosophy*. Berkeley: University of California Press, 1951.
- Rein, M., and White, S. "Knowledge for Practice: The Study of Knowledge in Context for the Practice of Social Work." Working paper, Division for Study and Research in Education, Massachusetts Institute of Technology, 1980.
- Riesman, D., Gusfield, J., and Gansson, Z. *Academic Values and Mass Education*. New York: Doubleday, 1970.
- Rogers, C. R. "Personal Thoughts on Teaching and Learning." In C. R. Rogers, *Freedom to Learn: A View of What Education Might Be*. Columbus, Ohio: Merrill, 1969.
- Ryle, G. *The Concept of Mind*. London: Hutchinson, 1949.
- Sachs, D., and Shapiro, S. "Comments on Teaching Psychoanalytic Psychotherapy in a Residency Training Program." *Psychoanalytic Quarterly*, 1974, 43 (1), 51-76.
- Sachs, D., and Shapiro, S. "On Parallel Processes in Therapy and Teaching." *Psychoanalytic Quarterly*, 1976, 45 (3), 394-415.
- Schein, E. *Professional Education*. New York: McGraw-Hill, 1973.
- Schön, D. A. "A Study of Field Experience." Unpublished memorandum, Massachusetts Institute of Technology, 1973.
- Schön, D. A. *The Reflective Practitioner*. New York: Basic Books, 1983.
- Schubert, F. *Wanderer Fantasy*, Op. 15. In *Schubert's Piano Pieces*, Vol. 1, No. 29. New York: Lea Pocket Scores. (Written in 1822.)
- Shils, E. "The Order of Learning in the United States from 1865 to 1920: The Ascendancy of the Universities." *Minerva*, 1978, 16 (2), 159-195.
- Simon, H. *Administrative Behavior*. (2nd ed.) New York: Macmillan, 1969.



- Simon, H. *The Sciences of the Artificial*. Cambridge, Mass.: M.I.T. Press, 1976.
- Spence, D. P. *Narrative Truth and Historical Truth*. New York: Norton, 1982.
- Sullivan, H. S. *The Interpersonal Theory of Psychiatry*. (H. S. Perry and M. L. Gawel, eds.) New York: Norton, 1953.
- Tolstoy, L. N. "On Teaching the Rudiments." In L. Wiener (ed.), *Tolstoy on Education*. Chicago: University of Chicago Press, 1967. (Originally published about 1861.)
- Veblen, T. *The Higher Learning in America*. New York: Hill and Wang, 1962. (Originally published 1918.)
- Vickers, G. Unpublished memorandum, Massachusetts Institute of Technology, 1978.
- Weick, K. *The Social Psychology of Organizing*. (2nd ed.) Reading, Mass.: Addison-Wesley, 1979.
- Witgenstein, L. *Philosophical Investigations*. (G.E.M. Anscombe, trans.) New York: Macmillan, 1953.



## Index

- A**
- Aalto, A., 54, 61, 161
- Ackoff, R., 42
- Alexander, C., 23
- Ammon, 183-208, 210, 212, 214, 215
- Appreciative system, and practice, 33
- Apprenticeship, and practicum, 37
- Architecture education: and artistry, 11, 18; background on, 41-43; design process in, 44-79; dialogue in, 100-118; as educational model, 41-172; and learning to design, 80-99; reflective practicum for, 157-172; teaching and learning processes in, 119-156; technical rationality in, 314
- Arendt, H., 26
- Argyris, C., 19, 135, 141, 168, 173, 255-260, 263-264, 267, 270-274, 276, 278-281, 283, 289-290, 292-293, 295, 296, 298
- Aristophanes, 310
- Arthur, 265-267, 272
- Artistry: concept of, 22; and professional education, 3-21; and reflection-in-action, 22-40
- B**
- Bach, J. S., 177-178, 182, 214
- Bamberger, J., 155*n*, 322
- Barnard, C., 24
- Behavioral world: concept of, 127; and learning binds, 125-137; of professional education, 310
- Reinart, J., 44*n*
- Bentley, A. F., 73, 222
- Brahms, J., 179, 210, 212
- Brooks, H., 11
- Burger, W., 8
- Business education: and artistry, 4, 8, 10, 14-15; dual orientation of, 307-308; reflective practicum in, 323-325; squeeze play in, 317-319
- C**
- Carpenter, E., 31, 217
- Casals, P., 176-179, 182, 208, 214, 215
- Chopin, F., 181, 182
- City planning. *See* Urban planning education
- Coaching: and communication, 95-99; comparison of models of, 295-298; as deviant tradition, 17; and dialogue with student, 100-118; Follow me! style of, 207-208, 214-216, 296-297; functions of, 152, 176, 201-208; hall of mirrors style of, 253-254, 293-295, 297; joint experimentation style of, 212-214, 296; and Model II behavior, 298-302; models of, 212-216; in practicum, 38-39; in reflective practicum, 163-166; role and status of, 311; stance for, 125, 126-142
- Cohen, D. K., 40*n*
- Coleridge, S. T., 94