MODELS OF TEACHING

FIFTH EDITION
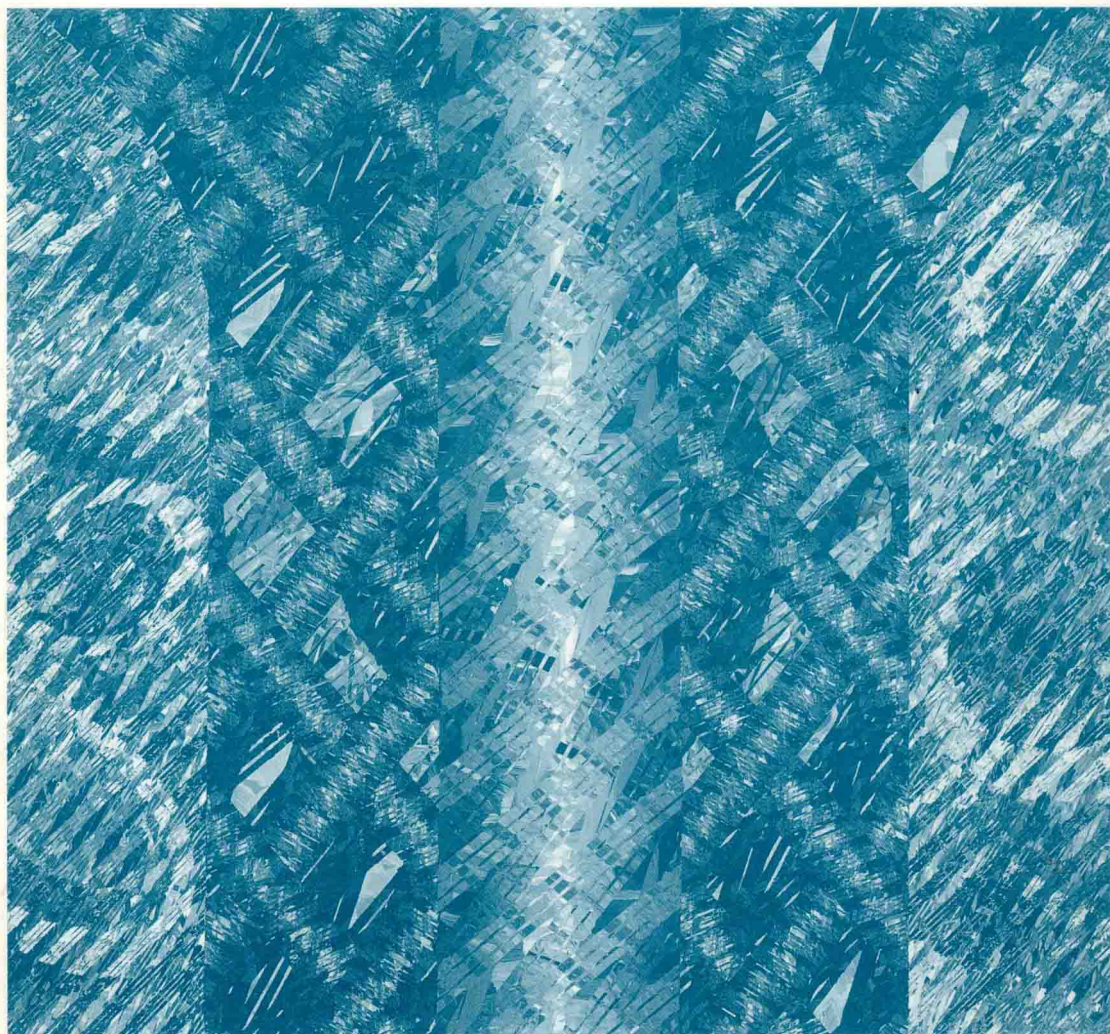
BRUCE JOYCE ❖ MARSHA WEIL

MODELS OF TEACHING

Bruce Joyce
Marsha Weil

Dedicated to Elinor and Joel Duncan.
If true humanism is congenitally driven, they've got it.

FOREWORD

The autumn efflorescence of color annually admired in New England foliage is no less visually exciting or aesthetically satisfying because it is familiar and oft-observed. Neither is a new publication of *Models of Teaching* less intellectually stimulating or professionally rewarding because one has admired earlier editions of the work. Although I now live most of the year in Florida, I never willingly miss an October in Vermont or up-state New York. And while I'm now only an occasional teacher, I could never ignore a fresh, while yet familiar, demonstration of the authors' insights into the mysteries and complexities of teaching.

The essential task of this realization of *Models of Teaching*, as, indeed, of all earlier editions, is to describe a rich variety of approaches to teaching—in sufficient detail and with sufficient illustration of their uses and purposes in real learning situations as to make each model an active, or at least potentially active, part of a teacher's repertoire. No teacher, prospective, neophyte, or veteran, could examine these models without a renewed sense of the multiplicity of educational purposes, the range and diversity of useful teaching behaviors, or the intellectual zest inherent in the craft.

No model is presented didactically. Each is discussed in terms of its underlying theory and of the problematics intrinsic to its use. Research testing the effectiveness of each model is nicely marshalled. Citing such theory and research is clearly not intended to provide closed, static "proofs" of the efficacy of individual models, but to encourage reflection and inquiry about yet unknown aspects of teaching strategy. Readers of this book are never assumed to be passive receptacles of the authors' wisdom.

I am impressed, as I have long been, with the breadth of scholarship, the command of psychological and pedagogical literature, and the sheer professional enthusiasm that *Models of Teaching* exemplifies. It is true that I have grown accustomed to such virtues and have duly noted them in earlier editions of the book. But I still respond, also, to the familiar golds, the reds, the browns, and the persistent greens of New England autumns. Each manifestation, be it of book or foliage, is a uniquely exciting experience.

Robert J. Schaefer
Longboat Key, Florida

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Drawing on the knowledge base and our own inventions, we begin the inquiry into the nature of learning and teaching.

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Teaching well means helping students learn well. Powerful learners have expanded repertoires of strategies for acquiring education. Models of teaching are designed to impart these strategies while helping students develop as persons, increase their capacity to think clearly and wisely, and build social skills and commitment. Teaching is the process of building communities of learners who use their skills to educate themselves.

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Well-developed models of teaching are the products of long periods of inquiry into how students learn. Over the years, four families of models have developed, each emphasizing particular aspects of learning, but all sharing the fundamental purpose of increasing capacity for self-education and the personal construction of knowledge.

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We are never finished with the study of learning and teaching. The research on models of teaching is in continual change as teacher-researchers refine the models and create new ones. Building student capacity for learning is the theme as we review the research and study the effects to be expected when we add various models to our repertoires and those of our students.

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As teachers we continually construct skills and knowledge, and the effective learner does the same. In both cases, thinking about how learning takes place—the metacognitions of learning—has a central role. Current inquiry has led to multidimensional concepts of intelligence and to the belief that a major outcome of education is increases in intelligence.

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The social family capitalizes on our nature as social creatures to further learning and to expand our ability to relate productively to one another. The models range from the simple processes of organizing students to work

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The simplest forms of cooperative learning organize students to help one another respond to the cognitive and social tasks of the information-processing models of teaching. Widely used today through the efforts and research of Robert Slavin, David and Roger Johnson, and their colleagues, cooperative learning positively affects academic learning, social development, and the self-esteem of the learner. John Dewey proposed that group investigation should be the basic model for social and academic learning in a democratic society. Recent research and practice by Shlomo Sharan and his colleagues affirm and illuminate this broad, complex, and powerful model.

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PART III

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While research on how students learn to think is by no means a completed science, a variety of models can increase students' ability to seek and master information, organize it, build and test hypotheses, and apply what they are learning in their independent reading and writing and their exploration of themselves and the world about them. Some of these models induce the students to collect information and build concepts. Others teach them to profit from direct instruction through readings, lectures, and instructional systems.

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Classification is believed to be the fundamental higher-order thinking skill, and analytic and synthetic skills depend on the discriminations made through classification. Drawing on the work of Hilda Taba and others who have concerned themselves with the development of thinking processes, we present the basic classification model. This model begins with concept formation and proceeds to the development of generalizations, hypotheses, and inferences about causation.

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Concept attainment helps students learn categories and study how to learn and apply them. The model also provides teachers with an alternative to induction, enabling them to control data sets and help students develop precise knowledge of concepts.

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The focus is on learning how the academic disciplines construct knowledge
and how to join the inquiry. We use the example of the Biological Sciences
Study Committee biology program, developed under the leadership of
Joseph Schwab. Then we concentrate on a program, first developed by
Richard Suchman, to train students to engage in causal reasoning. The
training is built around sets of puzzling problems that the students attempt
to solve by collecting and verifying data, developing concepts, and building
and testing hypotheses.

CHAPTER 13

Recent research on memorization, especially on the use of "link words" to
facilitate associations, has produced some dramatic effects on the rate at
which students can acquire information and concepts. In some applications
the instructors generate the mnemonics. In others the students develop their
own. In both the students are organized into learning communities that pos-
sess knowledge about how to acquire, store, and retrieve information.
Research by Levin, Pressley, and their colleagues has stressed the impor-
tance of providing students with cognitive control over learning
strategies—the "metacognitive" dimension of being a student. In other
words, the students are not taught simply to engage in a learning activity.
They are taught how to learn and how to use knowledge of learning to
increase their effectiveness.

CHAPTER 14

It can be argued that the ability to go beyond the known and synthesize
fresh ideas and solutions is the ultimate information-processing skill. It can
also be argued that possessing the freedom to create is one of the peaks of
personal development. William Gordon has developed a procedure to help
people break set and generate fresh solutions to problems, generate more
lucid writing and speaking, and coalesce groups around creative problem
solving. Rather than conceiving of creativity as an isolating, inward process,
it is developed in groups and increases cohesion and empathy among group
members.

Designed to enhance the growing self, the model helps us reach into the psychological space of the students and enlist them in the learning-teaching partnership.

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The ultimate evidence of whether education has been effective is in the reciprocal relationships of educated people with their world—contributing to it and profiting from it. We discuss a framework for examining the growing self and modeling for our students a self-actualizing way of life.

PART V

THE BEHAVIORAL SYSTEMS FAMILY
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On the foundation of the work of B. F. Skinner a large number of approaches to learning have been developed, each taking advantage of the human being's ability to modify behavior in response to tasks and feedback. These models are used in a wide variety of applications, from teaching information, concepts, and skills to increasing comfort and relaxation, decreasing phobias, changing habits, and learning to control one's behavior. Our selection includes just a few of the ones with broad potential for uses in school settings.

CHAPTER 19

MASTERY LEARNING AND PROGRAMMED INSTRUCTION **329**

An important application of behavioral systems theory is in the development of systems that enable learning tasks to be regulated according to the progress of the learners and that teach students to pace themselves for optimal performance. Often these systems organize material to be learned in relatively small, sequenced, instructional "modules" presented to the students with assessments of learning embedded in them. These "mastery learning" and "programmed instruction" systems have wide applicability in academic curriculum areas. We stress the work of Benjamin Bloom in the development of mastery learning and Bloom and Carroll's conception of intelligence as a matter of time to accomplish certain kinds of tasks.

Direct instruction involves a straightforward use of tasks and feedback to help students master academic content. This approach is based on studies, especially by Jere Brophy and Tom Good, of effective teachers and on social learning theory, particularly the applications by Wes Becker and his colleagues.

In industrial, military, athletic, and educational settings, researchers have developed procedures for developing skills and enabling those to be used effectively in work and education. Computer-based simulations are readily adding to curricular options in elementary and secondary schools.

Planning instruction, adding to one's teaching repertoire, and learning as we teach are our themes.

Robert Gagné and his colleagues have developed a classification of learning goals that enables us to organize objectives and place them in appropriate sequence. We study planning, using Gagné's framework, and illustrate planning with a global education curriculum.

Based on 25 years of research on how we acquire teaching skills, we present a framework for organizing ourselves to expand our teaching repertoire.

CHAPTER 24
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For our students and ourselves, reaching out for new learning tools and
ideas involves some necessary and exciting discomfort. One of the major
challenges of teaching is to build learning communities that represent "safe
space" in which students can keep themselves on the move as learners. "At-
risk" students are those who are trying to stretch too limited a repertoire
over too many learning tasks. Our remedy is to design the school as a labo-
ratory for learning how to learn, a place where stretching one's capacity is a
way of life.

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These guides are designed to facilitate planning for practice with nine of the
most commonly used models of teaching and to provide formats for observ-
ing demonstration and peer practice.

PART I

FRAME OF REFERENCE

We move into the study of teaching as an inquiry by individuals, faculties, and school districts. As practitioners we use the knowledge base as a mirror for the study of our own practice and draw on the models of teaching that are the products of disciplined inquiry into teaching to find tools we can explore with our students. In these chapters we survey the available models, examine them as models of learning for students, and take stock of the research.

Perhaps the most important finding is that the purpose of teaching is to increase capacity to learn—the multifaceted thing we call intelligence. We find that education can greatly affect intelligence and that these tools we call models of teaching are one way to organize intelligence-oriented education.

Therefore, many of the differences that have often been said to inhibit learning—differences in race, gender, culture, and socioeconomic background—are trivial in comparison to the power education has to give the learners tools to educate themselves.

BEGINNING THE INQUIRY
Tooling Up the Community of Learners

> *Every once in a while I think we should have called the book* Models of Learning. *Then, I remember that real teaching is teaching kids how to learn. So I guess the title is all right.*
>
> —Marsha Weil to Bruce Joyce, January 1974

Let's begin by visiting two first-grade and two tenth-grade classrooms at 9:00 on the first day of school.

S C E N A R I O

In one first-grade classroom the children are gathered around a table on which a candle and jar have been placed. The teacher, Jackie Wiseman, lights the candle and, after it has burned brightly for a minute or two, covers it carefully with the jar. The candle grows dim, flickers, and goes out. Then she produces another candle and a larger jar, and the exercise is repeated. The candle goes out, but more slowly. Jackie produces two more candles and jars of different sizes, and the children light the candles, place the jars over them, and the flames slowly go out. "Now we're going to develop some ideas about what has just happened," she says. "I want you to ask me questions about those candles and jars and what you just observed." The students begin. She gently helps them rephrase their questions or plan experiments. When one asks, "Would the candles burn longer with an even bigger jar?," Jackie responds, "How might we find out?" Periodically, she will ask them to dictate to her what they know and questions they have and will write what they say on newsprint paper. Their own words will be the content of their first study of reading.

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