MODELS OF TEACHING

Bruce Joyce / Marsha Weil

THIRD EDITION

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Bruce Joyce

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To

Kevin, Brendan, Seamus,
Cynthia, and Lisa

FOREWORD

In writing a foreword to the first edition of *Models of Teaching* I observed, with delight, that this is a book for all seasons. Clearly, for those in the spring-time of their careers, it affords a lively and provocative introduction to the complexities of teaching. It is equally apparent, however, that educators of all levels of experience—provided only that they retain an interest in strengthening their instructional skills and broadening their repertoires of instructional styles and strategies—will find this book an invaluable resource and a highly-prized reference. I could imagine no teacher, whatever the season of his career, who would not covet such a wide-ranging and sensitively described array of alternate models of learning and teaching.

As I read this 1986 edition of *Models of Teaching* I am again impressed by its inclusiveness and by its pertinence to all educators, irrespective of tenure, who remain fascinated by the myriad ways students learn and teachers teach. But my dominant reaction in 1986 is that *Models of Teaching* speaks not only to seasons but to motives. Certainly, it resonates nicely with the basic perspectives teachers bring to pedagogical studies.

Ordinarily, teachers respond to discussions of method that are seen as relevant and applicable in their own classrooms. No model is described that has not been tested in actual learning situations, and each is illustrated from model-in-use experience. At the same time, teachers demand intellectually stimulating pedagogical studies—analyses which excite both their liberal and professional interests in education. Each model incorporates the theoretical considerations upon which it is based; each includes reports of the empirical research which supports it; and each acknowledges unresolved issues in its optimal use. Finally, understanding the uniqueness of particular teaching–learning interactions, and the individuality of the participants, teachers seek pedagogical studies that are flexible and allow for their active involvement. No model, fortunately, is presented didactically as a rigid and static prescription. Each clearly requires persistent sensitivity and continuous inquiry by teachers.

Models of Teaching implicitly recognizes the perspectives teachers bring to the study of their craft. To the degree that it manages to draw more teachers toward the serious analysis of pedagogy, all—students, teachers and society—will be well-served.

<div align="right">Robert J. Schaefer</div>

PREFACE

We dream of schools that combine technical power and humanity. In those schools students thrive as individuals, growing in personal strength and sensitivity to others. They are members of a cooperative community where each works for the benefit of the others, and they develop the social skills and values that enable them to participate fully and responsibly in their society. They master academic substance to understand the nature of organized knowledge. They learn the literatures of their culture and build the speaking, writing, and technical skills to communicate powerfully and sensitively.

In our schools students embrace the many models of learning that give them the tools to grow. Their teachers have great breadth of repertoire, and through their own continuous study of educational process and academic and social substance, they are a clear model of the educated person for their students—ever growing and always curious.

We humbly give thanks to all the educators through the centuries and in our own decades who have provided us with the wonderful storehouse of models of teaching that we are privileged to describe in this book.

CONTENTS

When we teach well, we help students learn well. A good model of teaching, in other words, helps learning. Powerful learners have repertoires of powerful strategies for acquiring educations. Models of teaching are designed to impart those repertoires while helping students learn information, ideas, and academic skills, develop social skills and values, and understand themselves and their environments.

Concepts are our tools for organizing information and approaching problems. This model is designed to teach concepts and to help students become more efficient at learning and creating them.

A fundamental method of science is also one of the important skills of daily life. Hilda Taba developed the Inductive Thinking Model presented here, designed to help students work together to learn information, build concepts, and solve problems.

This model is the core of a program to train students to engage in causal reasoning. The training is built around problems and a process of inquiry designed to lead the students to collect and verify information, develop concepts, and build and test hypotheses.

Psychologist David Ausubel has developed a theory of meaningful verbal learning on which a technology has been developed for structuring courses and presentations to increase the mental activities of the students.

Recent research on memory has resulted in the development of techniques for organizing material and teaching students how to master new information. Michael Pressley, Joel Levin, and their associates have explored the use of the link-word method with a wide range of subject matters and students.

Jean Piaget has stimulated the study of intellectual growth. A number of models have been developed to help us adjust instruction to the stages of growth of the students and to attempt to increase their rates of development.

The "model" for Scientific Inquiry Models is the practice of academic research. The student is introduced to the disciplines by analyzing problems and conducting research.

INTRODUCTION: *Focus on the Person*

All learning ultimately depends on the focused education of the individual student and has its expression in the enhancement of the self. Personalists have developed a variety of powerful models that focus on the individual and on the shaping of human groups that support one another's struggles to achieve meaning and strength for self-responsible self-determination.

Psychologist Carl Rogers has been the leading spokesperson for teaching oriented around the student's perceptual world. In Nondirective Teaching Models the teacher operates as a counselor, helping the students understand themselves, clarify their goals, and accept responsibility for their growth and the direction of their activities. Designed to enhance the growing self, the model is an important tool to help us understand our students and to enlist them in a teaching-learning partnership.

Designed to help people break set and generate fresh ideas and solutions to problems, synectics has a wide range of applications. It is used to widen perspectives on problems, generate more lucid and creative writing and speaking, and induce cooperative problem solving. Skillfully used, it has the important side effects of increasing empathy and group cohesion.

Gestalt therapists have adapted a number of models to fit the classroom situation and the needs of typical students. Sets of exercises have been crafted to increase understanding of human potential and of how to behave to increase the development of self and others.

William Glasser has developed a way of helping students share in the creation of a positive learning environment. The teacher and the students establish the norms by which they provide support to one another and the space for individuals to flourish.

Part III The Social Family —————————————— 215
INTRODUCTION: Cooperative Learning Models

We are social creatures and any group of human beings is more than the sum of its parts. In this family, models create education by confronting students with problems that they must solve together, by leading students to analyze their values and the public policies that shape justice in our society, and by introducing students to increasing their social skills and understanding.

13 GROUP INVESTIGATION
Building Education through the Democratic Process, *219*

Democracy is a way of solving problems through collective learning. John Dewey suggested that group investigation should be the basic model for social and academic education in a democratic society. Herbert Thelen extended and refined group investigation theory and practice. Recent research by Shlomo Sharan and his colleagues affirms and illuminates this broad, complex model.

14 ROLE PLAYING
Studying Social Behavior and Values, *239*

To stand back from oneself and think about one's social behavior and values is an extremely complex process, but a rewarding and essential component of education. Fannie and George Shaftel have become the architects of a model designed around the analysis of enactments of problem situations. The model is intended to open values to study and to improve social skills and increase cooperative behavior and empathy.

15 JURISPRUDENTIAL INQUIRY
Learning to Think about Social Policy, *258*

The making of social policy is a basic need in small groups, communities, and nations. Built around case studies of problems which can only be resolved by clarifying values and resolving conflicts among interests and values, the Jurisprudential Inquiry Model introduces students to policy analysis. As developed by James Shaver and Donald Oliver, the model can be used to design entire social studies courses or to illuminate policy questions in science, athletics, and many other curriculum areas.

16 LABORATORY TRAINING
Developing Interpersonal Skill, *275*

Beginning with the observation, during World War II, that both informal and formal leadership depended on the interpersonal skills of both leaders and group members a series of models were developed to teach people to analyze interpersonal situations and to generate productive methods for working together. These models have been extended to a variety of organizational settings. They provide a direct avenue both for educating students to use productive interpersonal styles and also for improving the social climates of the schools themselves.

17 SOCIAL SCIENCE INQUIRY
Studying Human Behavior on Spaceship Earth, *292*

In a fashion similar to the way we use natural science inquiry models, we can use the methods of social science to teach the social studies. The model presented here was designed by Byron Massialas and Benjamin Cox to teach information about social, economic, and political life.

Drawing particularly on the work of B. F. Skinner a large number of models have been designed to take advantage of the human being's capacity to learn and modify behavior by responding to tasks and feedback. These models are used to teach information, concepts, and skills, to increase comfort and relaxation and reduce phobias, to change habits, and to help students engage social and academic tasks appropriately.

One of the important applications of behavioral systems theory is in the development of instructional systems that enable learners to adjust the pace of instruction and to record their own progress. Often these systems organize material to be learned in relatively small, sequenced instructional modules that are presented to the students with assessments of progress embedded in them. These "mastery learning" or "direct-instruction" systems have been employed successfully in a wide variety of areas involving academic and physical and mental skills.

This model is designed to help students understand their personal and social situations and to manage their behavior productively.

The principles of cybernetics have been employed to design learning environments—from board games to computer simulations to elaborate laboratories for learning. Students are presented with tasks and then receive feedback about their performances. They teach themselves by observing the results of their actions.

Designed specifically to help students analyze communication tasks and problems and to develop a repertoire of social skills for handling ordinary and stressful situations, this model is being used increasingly in both elementary and secondary schools. A nice side effect is that increases in social competence frequently improve both feelings about self and academic performance.

Models of teaching are designed to bring about learning. In these chapters we examine the evidence about their effectiveness and discuss how to select and combine them for maximum effect.

Educational environments are designed to increase the probability that certain kinds of learning will take place and that their effects will be durable. We examine the argument that they will succeed and some of the evidence that has been accumulated about their warrants.

The repertoire of models is most useful in teaching if we plan ahead and design courses and units of instruction to make maximum use of their potential.

24 THE CONDITIONS OF LEARNING
Focusing Instruction, *427*

Robert Gagné has provided us with a paradigm for organizing instruction, ensuring that prerequisites are identified and taught as the basis for advanced material and skills.

Individual differences can either make teaching delightful or confound it. The productive use of individual differences requires both the adaptation of instruction and the development of the students' abilities to adapt productively in the learning environment.

25 LEARNING STYLES AND MODELS OF TEACHING
Making Discomfort Productive, *435*

We select and adapt models so that the students can function effectively but are stretching the range of environments from which they can profit.

26 A MODEL FOR MATCHING ENVIRONMENT TO PEOPLE
Conceptual Systems Theory, *449*

David Hunt's adaptation of the system for analyzing learning styles and educational environments that he developed with Harold Schroder and O. J. Harvey gives us a method for predicting student preferences and accommodating them without sacrificing their needs to expand their learning repertoires.

The storehouse of educational models has power only if we learn to use the models effectively. Held rigidly, they have mechanical power only. Fluid control requires practice and a spirit of lifelong experimentation with teaching.

27 HOW TO LEARN A TEACHING REPERTOIRE
Training Ourselves, *469*

Recent research has given us a clearer picture of how we acquire the skill to use models of teaching that are new to us. In this chapter we explore how to use that research to increase our learning power.

28 EDUCATIONAL THEORY, RESEARCH, AND PRACTICE
Creating an Art and Science of Education, *490*

Professional knowledge comes from the analysis of clinical practice with teaching and the operation of schools; from research; and from the building of theory. Their proper use depends on a perspective about what each contributes and how we can draw on the knowledge of others and make it contribute to our own practices.

THE THINKING, FEELING STUDENT
Alternative Models of Learning

In this book we describe a variety of approaches to teaching, discuss their underlying theories, examine the research that has tested them, and illustrate how to use them. There are many powerful models of teaching designed to bring about particular kinds of learning and to help students become more effective learners. As educators we need to be able to identify these models and to select the ones that we will master in order to develop and increase our own effectiveness. To become competent to use these teaching strategies comfortably and effectively requires much further study and practice. (Chapter 27 describes the process of acquiring the necessary teaching skills.)

Although written from a perspective on teaching, in a real sense this book is about models of *learning*. As we help students acquire information, ideas, skills, values, ways of thinking, and means of expressing themselves, we are also teaching them how to learn. In fact, the most important long-term outcome of instruction may be the students' increased capabilities to learn more easily and effectively in the future. How teaching is conducted has a large impact on students' abilities to educate themselves.

Imagine a school where the variety of models of teaching is not only intended to accomplish a range of curriculum content goals (learning to read; to compute; to understand mathematical systems; to comprehend literature, science, and the social world; and to engage in the performing arts and

athletics) but is also designed to help the students increase their power as learners. Thus, as students master information and skills, the result of each learning experience is not only the content they learn, but the greater ability they acquire to approach future learning tasks.

In our school the students learn a range of learning strategies because their teachers use the models of teaching that require them. Our students learn models for memorizing information (described in Chapter 6). They learn how to attain concepts (Chapter 2) and how to invent them (Chapter 3). They practice building hypotheses and theories (Chapter 4) and using the tools of science to test them (Chapters 8, 13, and 17). They learn how to extract information and ideas from lectures and presentations (Chapters 5 and 6), how to study social issues (Chapter 15), and how to analyze their own social values (Chapters 13 and 14).

Our students also know how to profit from training and how to train themselves in athletic, performing arts, mathematical, and social skills (Chapters 18, 19, and 20). They know how to make their writing and problem solving more lucid and creative (Chapter 10). Perhaps most important, they know how to take initiative in planning personal study (Chapter 9), and they know how to work with others to initiate and carry out cooperative programs of inquiry (Chapters 12 and 13).

These students are both challenging and exhilarating to teach, because their expanded learning styles enable us to teach them in the variety of ways that are appropriate for the many goals of education. The most direct route to effectiveness in teaching is to teach the students how to fight effectively for an education. The stronger they are, and the more tools they possess, the more effective we are as teachers.

The core of the process of teaching is the arrangement of environments with which the student can interact (Dewey, 1918). A model of teaching is a plan or pattern that we can use to design face-to-face teaching in classrooms or tutorial settings and to shape instructional materials—including books, films, tapes, and computer-mediated programs and curriculums (long-term courses of study). Each model guides us as we design instruction to help students achieve various objectives.

SOURCES OF MODELS OF TEACHING

For the last twenty years we have conducted a continuous search for promising approaches to teaching. We visit schools and classrooms, examine curriculums, and study research on teaching. We also look at the work of therapists and industrial, military, and athletic trainers. We have found models of teaching in abundance. Some have broad applications while others are designed for very specific purposes. They range from simple, direct pro-

cedures that get immediate results to complex strategies that students can acquire only after patient and skillful instruction.

For inclusion in this book we have selected models that constitute a basic repertoire for schooling—that is, with them we can accomplish most of the common goals of schools. Also, they represent a broad range of approaches to education. They include many, but not all, of the major philosophical and psychological orientations toward teaching and learning. Each of them has a coherent theoretical basis—that is, their creators provide us with a rationale that explains why we expect them to achieve the goals for which they were designed. The selected models also have long histories of practice behind them: They have been refined through experience so that they can be used comfortably and efficiently in classrooms and other educational settings. Furthermore, they are adaptable: They can be adjusted to the learning styles of students and to the requirements of subject matter.

Finally, there is evidence that they work. In addition to experience, all of them are backed by some amount of formal research that tests their theories and their abilities to gain effects. The amount of related research varies from model to model: Some are backed by a few studies while others have a history of literally hundreds of studies. Some of the more important studies are discussed in this text; thorough discussions are provided in Chapters 22, 23, and 28.

In assessing the research we are concerned with the general educative effects of each model and the specific, "model-relevant" effects for which it was designed. For example, the "Scientific Inquiry" Models (Chapters 8 and 17) were designed to teach students the methods of science. That is their primary, direct mission. Research clearly indicates that those models achieve those effects very well, but that "traditional," "chalk-and-talk" methods of teaching science are very poor instruments for teaching the scientific method (Bredderman, 1983; El Nemr, 1979). Just as important, scientific inquiry increased the amount of information students learned, encouraged their development of concepts, and improved their attitudes toward science. What is of interest to us is that those models both achieved their primary goals and also had general educational benefits with respect to these important acquisitions and developments.

We are satisfied when some models achieve small but consistent effects that accumulate over time. The Advance Organizer Model (Chapter 5), which is designed to increase the acquisition and retention of information from lectures and other kinds of presentations—such as films and readings—achieves its results when the "organizers" are properly used (Joyce, Showers, Dalton, and Beaton, 1985). Lectures, written assignments, and films and other media are so pervasive as educational tools that even relatively modest increments of knowledge from specific uses of organizers can add up to impressive increases in learning: Consider the thousands of hours of presentations and readings to which a group of students is exposed as part of its education.

Perhaps the most interesting research has resulted when several models have been combined to attack multifaceted educational problems. Robert L. Spaulding, for example, developed a program for economically poor, socially disruptive, low-achieving children that used social learning theory (Part 4), techniques based on knowledge from developmental psychology (Chapter 7), and Inductive Teaching Models (Chapter 3). That program succeeded in improving students' social skills and cooperative learning behavior, induced students to take more responsibility for their education, substantially increased students' learning of basic skills and knowledge, and even improved students' performances on tests of intelligence (Spaulding, 1970).

Spaulding's work illustrates the importance of combining models in an educational program to pyramid their effects and achieve multiple objectives. Effective education requires combinations of personal, social, and academic learning that can best be achieved by using several appropriate models.

Also, although many models have been designed to promote specific kinds of learning, they do not necessarily inhibit other objectives. For example, inductive teaching methods (Chapter 3) are designed to teach students how to form concepts and test hypotheses. Tests of these models have found that they are also excellent ways of helping students learn information. In addition, the information so learned is likely to be retained longer than that learned by the recitation and drill-and-practice methods that are so common in schools (Worthen, 1968).

Methods designed for particular kinds of content can often be adapted successfully for others. Inductive methods, for example, were designed for academic content in the sciences and social sciences, but they can also be used for studying literature and social values.

However, it would be a mistake to assume that because a particular model is effective, it should be used exclusively. Inductive models illustrate this point also. If they are used relentlessly for all purposes, they achieve less than optimal results (see Shulman and Keislar, 1966). Creativity is valuable and the creative spirit should pervade our lives. But much learning requires noncreative activity. Memorization is important too, but to build all of education around memorization would be a serious mistake.

A few models of learning can have dramatic effects in specific applications. The "link-word" method, one of several models that assist memorization, has increased learning two to three times in a series of experiments. Essentially, this means that students learned given amounts of material two to three times more rapidly when they used the link-word methods than they would have if they had used customary procedures for memorizing words (Pressley and Levin, 1982). However, such dramatic effects should not lead us to attempt to achieve all objectives with the link-word method. It is one of the models of choice when rapid acquisition of information is concerned, but it is not the sole answer to the problems of education.

Thus, as we study the tested alternative models of teaching, we find no

easy route to a single model that is superior for all purposes, or even that should be the sole avenue to any given objective. However, we do find powerful options that we can link to the multiple educational goals that constitute a complete educational diet. The message is that the most effective teachers (and designers) need to master a range of models and prepare for a career-long process of adding new tools and polishing and expanding their old ones. Spaulding's (1970) work contains many relevant and important lessons, especially that combinations of models can have a more dramatic effect on learning than any one could have alone.

FAMILIES OF MODELS

We have grouped the models of teaching that we have discovered into four families that share orientations toward human beings and how they learn.

THE INFORMATION-PROCESSING FAMILY

Information-processing models emphasize ways of enhancing the human being's innate drive to make sense of the world by acquiring and organizing data, sensing problems and generating solutions to them, and developing concepts and language for conveying them. Some models provide the learner with information and concepts; some emphasize concept formation and hypothesis testing; and still others generate creative thinking. A few are designed to enhance general intellectual ability. In general, as we see, many information-processing models are useful for studying the self and society, and thus for achieving the personal and social goals of education.

The following information-processing models are described in Part One:

CONCEPT ATTAINMENT

This model, built around the studies of thinking conducted by Bruner, Goodnow, and Austin (1967), is designed to help students learn concepts for organizing information and to help them become more effective at learning concepts. It includes an efficient method for presenting organized information from a wide range of areas of study to students of every stage of development.

INDUCTIVE THINKING

The ability to create concepts is generally regarded as one of the basic thinking skills. The model presented here is from the work of Hilda Taba (1966). Its tasks induce students to find and organize information; to create

names for concepts; and to explore ways of becoming more skillful at discovering and organizing information and at creating and testing hypotheses describing relationships among sets of data. The model has been used in a wide variety of curriculum areas and with students of all ages.

INQUIRY TRAINING

Designed to teach students to engage in causal reasoning and to become more fluent and precise in asking questions, building concepts and hypotheses, and testing them, this model was first formulated by Richard Suchman (1962). Although originally used with the natural sciences, it has also been applied in the social sciences and in training programs with personal and social content.

ADVANCE ORGANIZERS

During the last twenty years this model, formulated by David Ausubel (1963), has become one of the most researched in the information-processing family. It is designed to provide students with a cognitive structure for comprehending material presented through lectures, readings, and other media. It has been employed with almost every conceivable content and with students of every age. It can be easily combined with other models—for example, when presentations are mixed with inductive activity.

MEMORIZATION

Mnemonics are strategies for memorizing and assimilating information. Teachers can use mnemonics to guide their presentations of material (teaching in such a way that students can easily absorb the information), and they can teach devices that students can use to enhance their individual and cooperative study of information and concepts. This model has also been tested over many curriculum areas and with students of many ages and characteristics. As indicated previously, some of the applications of memorization strategies have had dramatic effects. We include variations developed by Pressley and Levin (1981) and popular applications by Lucas and Lorayne (1974).

THE DEVELOPING INTELLECT

Models based on studies of students' intellectual development (Piaget, 1952; Kohlberg, 1976; Sullivan, 1967; and Sigel, 1969) are used to help us adjust instruction to the stage of maturity of an individual student and to design

ways of increasing the student's rate of development. The model can be used in all types of educational settings and with all types of content. Curiously, the bulk of such development models are used with young children, particularly environmentally disadvantaged children, especially when the educational goal is to accelerate their growth (Spaulding, 1970). The applications for older students are, nevertheless, just as important (Purpel and Ryan, 1976).

SCIENTIFIC INQUIRY

As indicated earlier, a number of models have been developed to teach academic content with the methods by which it was created. The purpose of such models is to teach the scientific method in a straightforward manner, and to teach the fundamental concepts of the disciplines and the basic information necessary to understand the area (Bruner, 1960).

Applied particularly to the sciences and social sciences, information-processing models, with appropriate modifications, have been used successfully with both older and younger students. We illustrate with a model for the study of biology (Schwab, 1965).

The long-term goal of all information-processing models is to teach students how to think effectively (see Chapter 22 for an explicit discussion of this goal); all rest on the thesis that students learning more complex intellectual strategies will have greater ability to learn and will absorb more concepts and information if they are taught with complex models for handling information.

THE PERSONAL FAMILY

Ultimately the human reality resides in our individual consciousnesses. We develop unique personalities and see the world from perspectives that are the products of our experiences and positions. Common understandings are a product of the negotiation of individuals who must live and work and create families together.

The personal models of learning begin from the perspective of the selfhood of the individual. They attempt to shape education so that we come to understand ourselves better, take responsibility for our educations, and learn to reach beyond our current development to become stronger, more sensitive, and more creative in our search for high quality lives.

The cluster of personal models pays great attention to the individual perspective and seeks to encourage productive independence, so that people become increasingly self-aware and responsible for their own destinies.

The following personal models are described in Part Two: