

# Models of the Learner

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Topics, including the topics of keynote addresses to learned societies, have a hermeneutic history. The hermeneutic history of a topic, we are cautioned, must be taken into account if we are fully to interpret its meaning. The topic of my paper, *Models of the Learner*, is no exception. It has such a history and has a proximal origin in a set of exchanges—first as a conversation and then as the topic of a more formal learned discussion.

Let me set forth the beginning narrative of that hermeneutic circle (or spiral) and continue it in the discussion that follows. The setting was an international conference in the not very Orwellian summer of 1984, a conference ostensibly on the vexed subject of how to improve the quality of education. Sponsored jointly by the Van Leer Jerusalem Foundation and the Aspen Institute, it took place in a handsome mansion overlooking one of the scenic lakes on the outskirts of Berlin—a mansion that had been reconstructed on the ruins of the residence of the infamous Goebbels, Hitler's Minister of Culture, or was he the Minister of Propaganda? The participants were appropriately distinguished: some Deans of famous faculties of education, more than a sprinkling of great names in what everybody would agree is educational research, and a handful of psychologists and associated behavioral scientists whose work bore that tangential relation to the process of education that excites the

optimism of educators with respect to the relevance of "pure" research. We were perhaps two dozen in number, and it was a convivial company.

After a day and a half of discussion on topics of great generality, all conducted at a level of striking knowledgeability, someone proposed that we could really not get to the heart of the matter unless we had more clearly in mind some working model of what a learner was, how he or she operated, and above all, what we thought to be an adequate learning environment for our putative learner. It was proposed to the plenary session that we give over the next morning to these issues.

I was among those asked to prepare some sort of statement on the matter. The discussion that ensued was lively. What it left behind in my mind and what several of us discussed later was the flat-footed impossibility of ever settling institutional questions of education without first making a decision—yes, a political decision—on the nature of learning and learners. Yet for all that, the decision about learning and learners was perforce a decision about an ideal, about how we conceived what a learner *should* be in order to assure that a society of a particularly valued kind could be safeguarded. There is no completely naturalistic way of resolving the question about what model of the learner we want to enshrine at the center of our practice of education. For there are many ways to learn and many ways of encouraging different forms of learning with different ends in view. At the heart of the decision process there must be a value judgment about how the mind should be cultivated and to what end.

While I wish to consider alternate models of the learner, I have no il-

lusion that I can do so just in the spirit of a naturalist or as a student of the learning process. In fact, models of the learner that are on offer in the psychological literature, in the cognitive sciences, or in AI are themselves constructions based on a selection not simply of data, but of the conditions under which learning is studied. As I tried to say a few years ago, it is possible to construct not only experimental studies but "real life" situations that make people (or pigeons, for that matter) look stupid or clever, generative or passive, combinatorial or rote (Bruner, 1982). Then the theoretical model that is constructed becomes, as it were, the text of the culture, and life is made to imitate text in the same subtle ways in which, in another closely related domain, life imitates art.

Please do not interpret what I am saying in the relativistic sense that all theories or models of the learner are equally true or even equally right. Rather, what I wish to say is that any model of learning is right or wrong for a given set of stipulated conditions, including the nature of the tasks one has in mind, the form of the intention one creates in the learner, the generality or specificity of the learning to be accomplished, and the semiotics of the learning situation itself—what it means to the learner.

This is *not* to say that a new or different model of the learner is needed for every task or situation in which learning takes place. To put it in the current jargon, it is absurd to insist that each and every theory of learning is utterly domain specific, that nothing general can be said about learners or learning or learning environments. You do not quite need a different model of a learner to talk about learning how to play chess, learning how to play the flute, learning mathematics,

Editor's Note: This paper was an invited address at the 1985 AERA Annual Meeting in Chicago.

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June/July 1985

Bruner, J. (1985). *Models of the Learner*. Educational Researcher, 14(6): pp. 5-8. 5

and learning to read the sprung rhymes in the verse of Gerard Manley Hopkins. Even if I do have to say it in folk psychology rather than in programming talk, all of them will involve attention and memory and courage and even, *pace* AI, some heuristics for maintaining frustration tolerance. The issue, as we shall see yet again, is that learning is indeed context sensitive, but that human beings, given their peculiarly human competence, are capable of adapting their approach to the demands of different contexts. But I am tipping my hand, for it is only later that I wanted to talk about a general model of a learner as one equipped to discriminate and deal differentially with a wide variety of possible worlds exhibiting different conditions, yet worlds in which one can cope.

Let me now take a fast gallop through the landscape we surveyed that day from the phoenix nest on the site of Goebbels' house in the exurbs of Berlin when we got down to our formal discussion of "models of the learner."

### Models of the Learner

*Tabula rasa.* The first, and perhaps the most ancient is really based on the Aristotelian notion of *mimesis*. In its 18th century version, it rested on the premise that experience writes on the wax tablet of the mind. One learns from experience (rather than through divine revelation or through received texts). Or as Locke put it, nothing gets into the mind save through the senses—but as Leibniz countered, nothing except mind itself. This view takes as a central premise that such order as there is in mind is a reflection of the order that exists in the world, and that is why the concept of association is always so central to empiricist theories. Things that are together in space and time in the world succeed, under the sway of this principle, in being together in the mind. I need not go into the troubles of empiricism. They have been raked over historically by everybody from Aristotle (whose *sensus communis* was something of a constructivist takeover bid) through the Schoolmen, from Kant through Wittgenstein and Chomsky. I want, rather,

to take it as a given, a cultural text in Geertz's sense, to be examined for its cultural significance in shaping our practices. I want to note only that, given belief in associationist empiricism, we adopted ideas about learning procedures to fit and constructed learning environments that in fact made people look like little empiricists—averting our eyes from all instances where it didn't, as for example in the acquiring of a language. And when we were forced to look at that, we concocted Augustinian theories about it and devised nonsense syllable research in support of them.

The formula for success in empiricism is to have experience.

*Hypothesis generator.* There is a class of learner models that represents a reaction against the rather passive view of empiricist, *tabula rasa* notions. They have in common a notion of intentionality at their center. The learner, rather than being the creature of experience, selects that which is to enter. The principle of selection varies from theory to theory: from the *sensus communis* of Aristotle and the *vis integrativa* of Aquinas that sorted the associated input of experience in the light of the principles of reason, to the principles of wish-fulfillment and ego defense of Freud that permitted us to experience (or interpret) only those parts of experience that were adequate compromises between the demands of conflicting needs. What exactly generates hypotheses or programs the filter, which selects and organizes what gets through the senses into the mind, varied widely and was always seriously underdefined. Even such towering learning theorists as Edward Tolman, Lev Vygotsky, and John Dewey, all of whom took the view that experience came shaped by hypotheses rather than by the world, were grandly vague in their specification of how hypotheses came into being—though Dewey and Vygotsky gave special pride of place to the role of language as a hypothesis-generator, a place that promised more than it delivered.

It was never altogether clear how to extrapolate an educational posture from hypothesis theories,

save in one respect. Emphasis was on an active curiosity guided by self-directed projects—a feature of Progressivism in America and in the unrealized pedagogy of Vygotsky's followers in the Soviet Union, unrealized save in the discipline of "defectology."

The formula for success in learning, according to the hypothesis formulation, is to have a good theory.

*Nativism.* At least three forms of muted nativism have shaped our models of the learner. One derives from Immanuel Kant. A second comes from Gestalt theory. The third, derivative of Descartes, is still with us in Chomsky's theory of mind. In a deep historical sense, they are all inheritors of the tradition of Platonism. All share one central concept: Mind is inherently or innately shaped by a set of underlying categories, hypotheses, forms of organizing experience. The task of the learner is to work his or her way through the cluttered surface structure of sense to an underlying or ideal or deep organization that provides a richer or righter or more predictive or more generalizable representation of reality. Where evolutionism entered this view (as with ethnologists and, in a shriller form, in sociobiology) it is assumed that the fit between the categories or hypotheses of mind and the world that they represent is a product of natural selection.

For all their disagreements on details, Nativist theories have one big thing in common: The opportunity to use and exercise the innate powers of mind is all. That is the formula for success as well.

*Constructivism.* Probably the most powerful expression of this view comes from Jean Piaget, although a more rigorous and considered expression of it can be found in the writings of the philosopher Nelson Goodman. The tenet of Piaget's constructivism is that the world is not found, but made, and made according to a set of structural rules that are imposed on the flow of experience. By structural rules it is intended to emphasize that knowledge is not local but derived from a structure of the whole—that local operations reflect universal operations of the system as a whole. Learning is bound

within the limits of the rules of the system; it consists of realizations of the general rules in application to particulars. Development consists of a series of stage-like progressions, stage change consisting of a change in the rules of the system and later rule systems absorbing earlier ones as special cases. The learning dynamic of the system at any stage is provided by an unstable equilibrium or dialectic between assimilating experience to the rules and accommodating the rules to experience. When the equilibrium becomes unstable enough, the structure changes.

The constructivist model of the learner places strong emphasis on self-propelled operations on the world as the way to mastery—a pretty wide-band conception. Its formula for success is that nothing succeeds like a theoretical system, and one succeeds supremely only by going to a higher system that subsumes it.

*Novice-to-Expert.* This view of the learner has so recently emerged that is hard to characterize. It is very practical, in some respects highly anti-theoretical. It operates within domains, almost at times denying the utility of a general theory—or perhaps that is a sign of its immaturity. It begins with the premise that if you want to find out about learning, ask first about what is to be learned, find an expert who does it well, and then look at the novice and figure out how he or she can get there. To aid in this task, simulate the novice's performance and the expert's in a computer program, and see what transformations and heuristics will get you from the one to the other. You may even be helped by studying and simulating some typical mid-stages. Such generality as may be present in learning different tasks will eventually show up in the simulations. The immediate challenge is to get the novice to be an expert as quickly and as painlessly as possible, and never mind high theory.

The formula for success is "be specific and be explicit." Or, a computer programmer is a better friend than a philosopher of mind. Or, it is more important to get through the keyhole than to see the sky. Or, and perhaps more seriously, subor-

dinate the learner to the steps he must take to attain expertise.

In sketching these views about the model of the learner, I have omitted an important issue, one that had better be treated independently of each, for it is curiously extrinsic to all of them. It is the issue of the carrot and the stick—the role of motivation in learning. It has been a source of embarrassment in the history of the subject from the Stoics to Skinner. Let me state its dilemma in the starkest way. How can knowing something be affected by whether the knowledge gained leads to reward or to punishment? If the theory of reinforcement related to the acquisition of knowledge, God would not have had to expel poor Adam and Eve from the garden for eating of the tree of knowledge. He would have arranged, Huck Finn style, for them to have developed a very bad stomach ache from the consumption of green apples. Instead, He knew that knowledge, once attained, is irreversible and for better or for worse. And so, if I may be Miltonian, he had to condemn them to a new way of life where that knowledge could be put to use.

It is the use of knowledge rather than knowledge itself that is affected by the nature of its consequences. Use implies performance; performance entails action. The carrot and the stick are instruments for affecting action, not thought. Thus the degree to which models of the learner feature reinforcement is the degree to which they concentrate on the behavior of the learner rather than on his or her mind. It is not surprising, then, that even in the heyday of the Empiricists (who thought of themselves as philosophers of mind) virtually nothing was said about carrots and sticks. Indeed, as Crane Brinton reminded us a generation ago in his classic *Anatomy of Revolution*, the precepts of Empiricism (particularly in John Locke) were designed to justify man's freedom from the authority of King and Clergy. He was, in this new dispensation, his own knowledge getter. Thus Jonathan Edwards could preach to his flock in Northampton on the frontier of the Massachusetts Bay Colony in the late 17th century that they too,

like Isaac Newton, could by their own efforts of mind unlock the secrets of God.

It is interesting, then, that most theories depicted the learner, either implicitly or explicitly, as self-motivated—at least while they concentrated on learning as a means of acquiring knowledge. Indeed, we can say that the carrot and the stick—reinforcement—have to do not with learning but with morality: how one acts on the basis of what one knows. Even then, the connection between reward and punishment on the one side and virtuous action on the other remains as obscure as ever. The debate over the effectiveness of, say, prisons rages as incoherently as ever. And the thought controls imposed by dictators are much more concerned with censorship and other means of stopping the flow of information than they are with tinkering with schedules of reinforcement.

#### A Model of Models

I have already tipped my hand, as I confessed in passing. There is no reason, save ideology and the exercise of political control, to opt for a single model of the learner. We *do* learn from experience, when that is all we have to go on. On occasion we act like induction machines, though it is rarely so dark out that we can't do better than that. Indeed, given half a chance, we generate hypotheses that take us way beyond the information given—often with good effect, and always with some risk, which requires courage and the buffering of a support system. There is every reason to believe that a nervous system evolved in nature and more latterly and swiftly in culture endows us with a set of useful presuppositions about both nature and culture. How else can we account for the swift mastery of language and other symbolic forms to which we take so easily and with insufficient knowledge for proper induction? How can we doubt that a culture that regulates its moods and acts according to such abstract inventions as interest rates, social slights, gross national products, and loyalty to Alma Mater is made up of people who not only construct the world in which they live but share it as an ontological given? It is even

true that if you want to be a postman or a trust officer, you would do well to look closely at how they go about their business and then try to

simulate them as a clever clone, hopefully keeping your tongue in your cheek and your powder dry the while.

What it amounts to, as I have already hinted, is treating all models of the learner as stipulative, and then inquiring into the conditions under which they might be effective or useful or comforting. If you genuinely believe that it improves a nation's confidence in its control over things to keep children in schools for a good part of the day, then do so. Or if you think formal schooling is structurally inevitable in a society with more disensus than consensus, again keep them in school. These are reasons of politics, and they plainly have a place in any debate, for education is political too. But if you see children learning mathematics by rote, you can also say (this time on more naturalistic yet practical grounds) that somebody got confused about models and slipped in an empiricist one in place of a constructionist one. In a word, the best approach to models of the learner is a reflective one that permits you to "go meta," to inquire whether the script being imposed on the learner is there for the reason that was intended or for some other reason.

There is not *one* kind of learning. It was the vanity of a preceding generation to think that the battle over learning theories would eventuate in one winning over all the others. Any learner has a host of learning strategies at command. The salvation is in learning how to go about learning before getting irreversibly beyond the point of no return. We would do well to equip learners with a menu of their possibilities and, in the course of their education, to arm them with procedures and sensibilities that would make it possible for them to use the menu wisely.

Here the hermeneutic circle ends. You cannot improve the state of education without a model of the learner. Yet the model of the learner is not fixed but various. A choice of one reflects many political, practical, and cultural issues. Perhaps the best choice is not a choice of one, but an appreciation of the variety that is possible. The appreciation of that variety is what makes the practice of education something more than a scripted exercise in cultural rigidity.

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