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ABSTRACT

This essay explores the characteristic failure of traditional formal educational methods to teach the learner much which will remain for long in that person's memory. It discusses a physiological model of learning/remembering and compares it to some other models and metaphors of cognition. It distinguishes between learning and remembering, and identifies two ways of knowing and two kinds of knowledge. The paper concludes with a discussion of laboratory learning as a way of reinforcing cognitive learning with experiences which involve the learner on more than one level of learning and knowing. (Contains 30 references.) (Author)

ON THE DIFFERENCE BETWEEN KNOWING AND KNOWING ABOUT

Alton Barbour

Abstract: This essay explores the characteristic failure of traditional formal educational methods to teach the learner much which will remain for long in that person's memory. It discusses a physiological model of learning/remembering and compares it to some other models and metaphors of cognition. It distinguishes between learning and remembering, identifies two ways of knowing and two kinds of knowledge. It concludes with a discussion of laboratory learning as a way of reinforcing cognitive learning with experiences which involve the learner on more than one level of learning and knowing.

Student: "Experience is certainly a wonderful teacher."

Zerka Moreno: "Sure, if you can learn from it."

I suppose that virtually everyone has had similar experiences. When I reflect on my formal education or look at old transcripts I discover that there are classes that I enrolled in and sat through in the past that I cannot remember at all. What did we listen to in World Political Geography or Restoration Literature or Philosophy of Education? Whatever went on in those classes has totally faded from my memory. In fact, most of the classes I took in high school and college are that way. For all long term practical purposes, I might just as well not have attended them at all. However,

when I went through boot camp, the navy thought it was important that I learn close order drill, be able to put out fires aboard ship, and that I be "checked out" on the M-1 rifle, a .30 caliber semi-automatic weapon that was accurate at 300 yards. They had me field strip and assemble the M-1 again and again, sometimes blindfolded. In my "minds eye" I can still see the barrel pointing to the left and the left side of the rifle exposed to me for disassembling. Even though I have not held an M-1 in my hands in over forty years, I am confident that if I had one, I could field strip it now. I believe that there is a difference between the two kinds of learning and remembering experiences I have just described, and it is the difference between learning something and learning about something. The consequence for those kinds of learnings is that in the end the learner either knows something or only knows about something. Another consequence is that one of those two kinds of learnings is better remembered than the other; we better remember what we are actively involved in and actually do ourselves than what we merely hear about from others. These distinctions are not new. A number of Western thinkers have concerned themselves with how we come to know (Rorty, 1979). Aristotle identified these differences as "knowledge that," and "knowledge how" (See Ackrill, 1963).

PEERING INTO THE BLACK BOX

Whether we know something or know about something starts with how we learned it and remember it, or what happened in the brain while the process was going on. The brain has been called a "black box" that we can't easily examine directly, but a lot of speculation and inference goes on based on what is fed into the black box and what comes out of it. Visionary psychologist, Donald Hebb (1949), explained the physiological part of the learning process as a reverberation of a neuron in interaction with other neurons and their eventual structural change with reinforcement. He said it

began with a sensory input which caused a central nervous system stimulation, which caused a neural reverberation, which led to patterns (cell assemblies and neural networks) formed by repeated stimulation. The cell assemblies were the storage units of memory (Cermak, 1972, p. 169 ff.). Thereafter, whenever one of the neurons in the cell assembly became stimulated, the entire system reverberated. The more complex the stimulus was, the more complex the entire cell assembly was likely to be. The more the stimulation was repeated, the more permanent the cell assembly was likely to be (Callender & Barbour, 1979). However, if there was no reinforcement, the "engram" or "tracing" in the neural network was likely to "decay." This explanation hypothesizes a specific neural network circuitry in learning and memory. Although this theory was based on the neurophysiological research of Canadian neurosurgeon Wilder Penfield, Charles Furst, Paul MacLean, and others in the 1940's through the 1960's, current explanations do not look substantially different. They mainly serve to refine our understanding of the process (Greenfield, 1997; Pechura & Martin, 1991; McConkey, 1996; Moreno-Diaz & Mira-Mira, 1996; Kunzig, 1998). One of those refinements is the addition of the terms "short term memory" (STM) and "long term memory" (LTM) (Bjork & Bjork, 1996; Klimesch, 1994; Shanks, 1997).

Short term memory and long term memory are not a dichotomy but points along a single continuum; they are elements of a single mechanism of storage. What often separates STM from LTM is dependent upon the number of stimulations or repetitions (what Elizabeth Loftus calls "rehearsals") the learner experiences that convert STM to LTM. STM might be acquired with a single stimulation, such as a phone number, and then forgotten immediately. LTM is likely to be the result a series of repetitions or repeated stimuli including "chunking" the bits of information together in units in

order to remember them better. Or what converts STM to LTM could be the kind of involvement in the learning experience that the learner had. What usually inhibits STM from becoming LTM is either interference when the information is being learned or a lack of repetition. Both decay and interference may be present in STM (Bjork & Bjork, 1996; Klimesch, 1994). If a person has a number of items or stimuli to deal with or think about, then each of those items would interfere with each of the others when that person is trying to learn. Each would divide that person's attention and serve as a distraction (Shanks, 1997). This sounds like the joke about the ichthyologist who forgot the name of a fish every time he learned the name of a student. We appear to have a limited capacity to handle or process items of information, regardless of the form (colors, numbers, letters, tones, etc.) that information may take. In fact, if the number of bits of information that a person confronts approaches or passes seven, she will "top off" at that number and can handle no more (Miller, 1956). This "crowding" type of interference is further compounded if there is a time lapse without a further repetition. The combination of interference and a time lapse makes it very difficult for a learner to remember much of anything. Most decay of learning (or loss of memory) occurs at the beginning (sometimes in seconds) when the learning is still in the STM stage. That is, if we didn't learn it well at the start, we are not likely to remember it later. There was a classic study of memory done in Germany by Hermann Ebbinghaus back in 1895. He first provided a condition in which people were asked to memorize three letter nonsense syllables; he combined this with a precise numerical measure of retention over time and was able to demonstrate that forgetting occurred most rapidly at first, within the first few minutes, and then slowed down, but that very little was remembered after nine hours and virtually nothing after a month (Klix & Hagendorf, 1986). On some rare occasions there is also what

has been called "flashbulb" or "now print" memory which is usually associated with highly significant events in peoples' lives. Typically, these are characterized as clear, indelible, and highly focused such as the permanent recollections people reported after the death of Lincoln, the death of Kennedy, and the Challenger disaster (Cohen, et al., 1986).

A WAREHOUSE FULL OF DESKS

Sometimes we hear the brain compared with a computer as if that were a natural metaphor because both of them are electrical and both process and store information. Others say that it is more like a library, with a card catalog and periodical index, in which you can hunt up whatever is shelved there. This approach says that although information may be misplaced or misfiled in the library, it is in there somewhere and isn't ever completely lost. But perhaps the brain is not at all as tidy or as linear as a computer or library. Because a single memory can be stored several places in the brain, Elizabeth Loftus (1980) says the brain is less like a computer or library than it is an old fashioned roll top desk with piles of paper, letters, and material stacked on top and a number of files, drawers, and cubby holes down below, each of which can be opened up and rummaged through. The things on the top of the desk can be compared with STM and the files, drawers, and cubby holes can be compared with LTM. To make the desk metaphor better represent the capacity of the brain, let us say that the brain is really more like a huge warehouse in which there are thousands of those old desks placed here and there, some in rows, and some in disorder. Things that are needed right away can be gotten off of the tops of the desks, and things that are rarely needed can be put into files and drawers for later retrieval. And any time we want to, we can rummage through the files and desk drawers and find all manner of interesting material. And yes, some things do get lost forever (Loftus, 1980).

Long term memory is the largest component of the memory system, and appears to be virtually limitless, in that it never seems to run out of space, or fill up its capacity (Shanks, 1997). As long as we live we keep adding to our memories. But we store what we learn in different ways, depending upon how we learned it. So, some of what we learned may be mislaid in the cubbyholes, for all practical purposes lost, and some of it is much more available. In the mental warehouse in those drawers and files of our old desks, we don't really index our memories uniformly like little neural 3x5 file cards. What we more accurately do is store bits of our experience on film clips and tape recordings (Loftus, 1980). If we have a good time going to a sporting event for three hours, we may remember that event. Lets us say by contrast that someone takes the same three hours and tells us about going to a sporting event. That we would probably find less personally involving and would most likely forget. What good does it do to take extended periods of time to tell people things if they inevitably end up forgetting them? It wastes the time of both persons, the teller and the hearer. So some ways of experiencing learning are more likely to stay with us. The more ways that we have to index the information, and the more associations we have for it, the more "drawers and files" we can put it into, the easier it is to find it later or to remember it.

How can a single bit of data be stored several places? Consider the process you sometimes go through when you are trying to remember the name of someone you haven't thought of for years. You say, "Remember the guy from Boston. Wore wire glasses, spoke German, and slept on a door. A good cook. Really knew poetry. Had been in the air force in Japan. He had a short name. I think it started with an S. Two syllables. It sounded like Smith or Smead. Had several girl friends all named Suzanne. Moved to Minnesota. First name was short, something like Charles. That's it. It was Carl,

Carl Schmider." All of those various aspects of association with the person and the name such as how it looked, how it sounded, how many syllables, how it started, etc. are stored in different places, making it possible for you finally to put enough of them together to identify the who it was. This capability for storing bits of experience in different places in the brain is an concept that we will return to later.

LEARNING AND REMEMBERING

The words "learning" and "remembering" are sometimes used interchangeably. If someone has acquired a poem, we say that she "learned it" or that she "remembers it." But the words are not always used that way. You wouldn't say that you learned that you had cereal this morning. When new meaning or new information is acquired, some reorganization of the cognitive structure occurs, as in the D.O. Hebb model mentioned earlier. For example, when you found out that the three angles of a triangle always add up to 180 degrees, we would say that you "learned it." When the emphasis is on the retention of information without any cognitive reorganization, then "memory" is the word used. For example, if you still retain that information about triangles, we would say now that you "remember" it (Howe, 1970, p. 86). A learning task usually emphasizes an organism's adaptation to the environment, adjusting and responding to stimuli, figuring out what's going on and what to do about it. A memory task usually emphasizes storing information and recalling it. While there is a difference or distinction between the two tasks, it is not necessarily clear cut, because these two phenomena have some processes in common. Generally though, learning has to do with the "acquisition of responses that allow an organism to select an appropriate response to what is going on in order to adjust to the environment" and maintain itself (Sechrest & Wallace, 1967, p. 67). Memory

is knowledge of a fact or event with the additional consciousness that we have thought it or experienced it before. The "additional consciousness" of the prior information or event is important because remembering always involves referring back consciously in the past (Smith, 1966).

THE TWO KINDS OF KNOWINGS

Earlier we spoke of two kinds of knowings. Basically the difference between knowing and knowing about is that knowing about is topical and is typically represented by third parties or categories, such as when we know about health care legislation or welfare reform or Bosnia or Somalia or the deficit and national debt. They are topical and are outside of us; we recognize them as being in some way distant from us and remote from our experience. Secondly, knowing about is always mediated in some way and is therefore indirect or less direct. That is, we can know about something such as discrimination, homelessness, the handicapped, child abuse, religious cults, or the ozone layer through reports, lectures, books, and television, but because it is mediated by them, it is less direct and we know it in a different way than if we were personally involved.

Another distinction between the two kinds of knowings is that one is an analytic knowledge and the other is an experiential knowledge. This is not to say that one is inherently superior to the other and that therefore we should only learn in one way. We need them both. Schools and universities exist to train the intellect, and that necessitates the learning of analytic knowledge. Analytic knowledge is important for a number of reasons. One is that it generally makes good sense to be informed about the world that we live in and we cannot know about all of it directly. This means that we are forced to learn about some of it indirectly and make it a part of our analytic knowledge. Secondly, through analytic knowledge we sharpen our critical thinking abilities and learn to distinguish

between good and bad, strong and weak ideas. When we learn to think critically about philosophy, for example, we can later apply the same analysis to other topics. Philosophy may seem abstract and intangible, but the application of philosophy's way of examining issues and questions can be seen as practical. Thirdly, a grounding in analytic knowledge allows us to think abstractly, to conceptualize. If we are capable of doing literary or rhetorical analyses of a play or poem or pamphlet or political tract, we have learned to go back and forth from the particular to the abstract and the abstract to the particular. We can put together the particulars in different ways and conceptualize them differently each time there is a different arrangement. We can play with old ideas and create new ideas. All of this is worthwhile.

What we usually miss out on in gaining analytic knowledge is personal experience, and personal experience is the foundation for everything that we know in a way that it becomes an enduring part of us. How do we learn to set a pick, block a scene, take a blood pressure, clear a mask, do a hook slide, parse a sentence, attach a regulator to a tank, triangulate a position, scan a poem, ski a mogul, tack into the wind, do a bunt, give a massage, change a tire, make a soup, splice a rope, change a diaper, throw a punch, do a dive roll, dead reckon, do a fireman's carry, sing a part, program a VCR, guide a raft down a rapids, do a flip turn, take a fall, build a fire, change fonts on a computer, play a role? And the answer is that generally we don't learn them well by reading a book or hearing a lecture about them. We don't really know any of these things well unless we actually do them. And if by doing them, we experience them enough, we know them well and they eventually become second nature, and can more easily be recalled. Think of that old saying about riding a bicycle; once you learn how, you never forget how to do it, no matter how long it has been since you rode one last. If we are

able to learn something both experientially as well as analytically, we have stored the "bits of experience" in more places in our mental "drawers and files," so they are more likely to stay with us and can be found and gotten out more easily. One theorist says that we "re-create" them in our minds (See Levy, 1994).

LABORATORIES FOR LEARNING

Of course, there are some who would dispute all of this, particularly many in higher education who believe that universities exist for training only the intellect, and that the acquisition of experiential knowledge is unnecessary for the more intelligent part of our population. They believe that you may have to show the less intelligent people what you want them to know but you only have to tell the smart ones. Elwood Murray, who was Director of the School of Speech at the University of Denver from 1931-1962, said that he never found that to be the case with either university students or faculty members, who are presumably smart people. Murray said that everyone learned better if they could be made to participate in their learning and take some responsibility for it, and that cognitive learning could be enhanced if it could be combined with experiential learning in order to create a lasting change in the person and make the learning an enduring part of them. This is what Murray called, "getting it inside their skins." He reasoned that this was why there were required laboratories for learning in all of the natural sciences and in foreign languages, in order to get the students to do something with what they were learning and to be familiar enough with the material that they would assimilate it. Why then, he thought, if it is routine in the natural sciences, shouldn't it work as well in the social sciences and humanities? He proposed and promoted laboratory learning in the communication curriculum in order for communication students to combine experiential and cognitive learning. In doing so, he pioneered

the use of the action and group facilitation methods of J. L. Moreno and Kurt Lewin in the communication discipline in higher education as early as 1947 (See Brownell, 1978; Moreno, 1947; Murray, 1946; Papile, 1979).

For Murray, laboratory learning was a way to combine the development of the intellect with meaningful personal experience. Murray's communication laboratories all had a sound informational base, and were characterized by high levels of activity and participation combined with opportunities for fairly immediate feedback about behavior. Laboratories can certainly engage the intellect and the cognitive processes, because typically there is an intellectual significance to whatever the subject matter is which is to be learned. Laboratories are also for "skills type" learning in which we improve a skill in a nonthreatening atmosphere by practicing something over and over again until we learn it well and can do it better, such as the rote learning of the times tables or the pronunciation of a foreign phrase, or the memorization of a poem. The old expression was to "learn it by heart." And laboratories are for "discovery type" learning in which we do an experiment and find out for ourselves the effect of social influence or the answer to a group problem or the nature of defensiveness. But because laboratories necessarily involve the learner actively in the learning process, laboratories also are for "affective type" learning, or what has been called "gut level" or visceral learning. Sometimes this is the most important learning of all.

If we can be emotionally involved in the learning so that we feel something that affects the flow of hormones in the bloodstream and engages the cardio-vascular and respiratory systems, such as when we feel empathy for another's sorrow or are so pleased with what we are doing that we laugh out loud, then we are filling our mental "film clips and tape recordings" with varied "bits of experience" that can

be stashed in several of the files and drawers and cubbyholes in the old desks of the mental warehouses of our minds. The more we actively participate in doing something while we learn instead of merely hearing about it, the more likely is that we will be personally involved in the learning on several levels. And the more ways we learn something and index the information, the easier it is to access it and remember it. Books and lectures are also a kind of learning experience and an important one. Certainly there are times when we need to be passive and contemplative, and to read or hear about somebody else's ideas, and to remain emotionally distant and removed. But if we really want to know something well and want for it to stay with us, that is not sufficient in itself. We are the sum total of all that we experience and learn from. To the extent that we want that learning experience to engage more than just the intellect and to be enduring, we will find it necessary to provide a strong experiential component to the learning event, ideally to make it a laboratory experience, so that finally we may end up with knowledge which becomes a part of us and which may endure for a lifetime.

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