



## Getting the Bugs Out of the Knowledge Bank Idea

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### Two Paradigms of Training/Learning

Much of the implicit theory used in development agencies sees training as the transmission or dissemination of messages to the clients. When the discussion turns to what is called "capacity-building" and "scaling up" it turns out to mean essentially the same methodology just at the wholesale instead of retail level. Partner institutions are seen essentially as 'microwave repeater stations' to retransmit the messages to the trainees (all subject, of course, to our "quality control"). This wholesale version of the transmission-to-passive-trainees paradigm is often called "training of trainers" or TOT. Yet there is a totally different paradigm which puts the client-learner in the driver's seat (active learning) and which sees the role of the teacher as the indirect role of helping to foster that active learning capacity (capacity building). In a book manuscript I am working on about the "client in the driver's seat" methodology, I find that the clearest and starkest way to make these distinctions is to draw on the biological contrast between learning in insects and learning in people.

### Learning in Insects versus Learning in People

There are two very different ways in which teaching and learning can take place. Both ways occur biologically if we view what is transmitted through the genetic mechanism from an organism to its offspring as the biological version of what is transmitted from the teacher to the learner. For many organisms, insects being a good example, the specific behaviors (that are fitted to certain stable environments) are transmitted by the genes from parents to offspring. The individual organism does not engage in learning from the environment as the appropriate behaviors are already determined by the structure of the organism that was transmitted through the genes. Thus any learning takes place only at the insect species level, not at the individual insect level. Norbert Wiener calls this "phylogenetic learning" as opposed to "ontogenetic learning" [1961, 169]. For instance, insects essentially have only phylogenetic learning whereas the mammals ("higher animals") have both phylogenetic learning and ontogenetic learning.

[The] very physical development of the insect conditions it to be an essentially stupid and unlearning individual, cast in a mold which cannot be modified to any great extent... On the other hand, ... the human individual [is] capable of vast learning and study, ...[and] is physically equipped, as the ant is not, for this capacity. Variety and possibility are inherent in the human sensorium...and are indeed the key to man's most noble flights...because variety and possibility belong to the very structure of the human organism. [Wiener 1954, 51-2]

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In animals capable of ontogenetic learning, the genes do not transmit the specific behaviors that might be fitted to certain environments; instead the genes transmit the learning mechanisms to the offspring. The animal then interacts with, adapts to, and learns from the environment. In this manner, the animal can learn much more complex activities in a wide variety of environments than could possibly be transmitted directly by the genes. Indeed, the adjectives "direct" and "indirect" can be used to describe these two approaches to learning.

The gene-pattern, as a store or channel for variety, has limited capacity. Survival goes especially to those species that use the capacity efficiently. It can be used directly or indirectly.

The direct use occurs when the gene-pattern is used directly to specify the regulator. The regulator is made (in the embryo) and the organism passes its life responding to each disturbance as the gene-pattern has determined. ...

The indirect use occurs when the gene-pattern builds a regulator (R1) whose action is to build the main regulator (R2), especially if this process is raised through several orders or levels. By achieving the ultimate regulation through stages, the possibility of large-scale supplementation occurs, and thus the possibility of an ultimate regulation far greater than could be achieved by the gene-pattern directly. [Ashby 1963, 270-1]

In the indirect case, the first regulator transmitted by the genes is the learning mechanism, and the second main regulator is the whole set of activities learned by the animal through interaction with the environment.

[The learning mechanism's] peculiarity is that the gene-pattern delegates part of its control over the organism to the environment. Thus, it does not specify in detail how a kitten shall catch a mouse, but provides a learning mechanism and a tendency to play, so that it is the *mouse* which teaches the kitten the finer points of how to catch mice.

This is regulation, or adaptation, by the indirect method. The gene-pattern does not, as it were, dictate, but puts the kitten into the way of being able to form its own adaptation, guided in detail by the environment. [Ashby 1960, 234]

The direct method (where genes transmit behaviors) and the indirect method (where the genes transmit a learning capacity) are essentially the genetic versions of two basic pedagogies. In the direct method, the teacher transmits knowledge to the passive student who absorbs and uses the knowledge as needed. In the indirect method, the teacher fosters and awakens an intrinsic desire for learning on the part of the learner who then takes the active role in (re)discovering and appropriating knowledge. In the indirect method, the teacher does not transmit knowledge, but "puts the [learner] into the way of being able to form [the learner's] own adaptation, guided in detail by the environment." Ortega uses a metaphor similar to Ashby's.

He who wishes to teach us a truth should not tell it to us, but simply suggest it with a brief gesture, a gesture which starts an ideal trajectory in the air along which we glide until we find ourselves at the feet of the new truth. ... He who

wants to teach a truth should place us in the position to discover it ourselves.  
[Ortega 1961, 67]

These two methods are also described in the old Chinese story that giving a man a fish only feeds him for a day while teaching him how to fish feeds him for a lifetime. Ashby develops a similar story. Suppose that a father only had ten minutes to teach his child the meanings of English words. Using the direct method, the father would teach the child the meaning of a small number of words.

The indirect method is for the father to spend the ten minutes showing the child how to use a dictionary. At the end of the ten minutes the child is, in one sense, not better off; for not a single word has been added to his vocabulary. Nevertheless the second method has a fundamental advantage; for in the future the number of words that the child can understand is no longer bounded by the limit imposed by the ten minutes. The reason is that if the information about meanings has to come through the father directly, it is limited to ten-minutes' worth; in the indirect method the information comes partly through the father and partly through another channel (the dictionary) that the father's ten-minute act has made available.

In the same way the gene-pattern, when it determines the growth of a learning animal, expends part of its resources in forming a brain that is adapted not only by details in the gene-pattern but also by details in the environment. The environment acts like the dictionary. While the hunting wasp, as it attacks its prey, is guided in detail by its genetic inheritance, the kitten is taught how to catch mice by the mice themselves. Thus in the learning organism the information that comes to it by the gene-pattern is much supplemented by information supplied by the environment; so the total adaptation possible, after learning, can exceed the quantity transmitted directly through the gene-pattern. [Ashby 1960, 236-7]

### **Knowledge Bank: For Ants or for People?**

The activities of the Knowledge Bank, or of knowledge-based development assistance in general, can be conceptualized using either of the two methods of training. The direct method corresponds to the usual or default conception of the Knowledge Bank as the storehouse of knowledge that is transmitted or disseminated to the passive clients who learn this knowledge and thus adopt the right behaviors. The genes that transmit these behaviors are the "core courses" or "standard modules" used to train the clients.

On the indirect method, the main knowledge-based function of the Knowledge Bank is capacity-development in the clients so that they can carry out their own learning processes in their environment. With the direct method, the Bank transmits or disseminates its catechisms distilled from its activities to the client so the client is spared the difficulties and perils of ontogenetic learning. With the indirect method, the Bank works to foster or build learning capacity in the clients so that they become active learners themselves. Note that "clients" can mean either individuals (as in training programs using active learning methods) or knowledge-based organizations (training institutions or think tanks that could become active learning

organizations). In order to scale up the activities of the Knowledge Bank, the capacity building would be more focused on organizations than individuals.

But what about all the Bank's learnings about best practices? To paraphrase Ortega, the Bank that "wants to teach a truth should place [the clients] in the position to discover it [them]selves." In that manner, the client is in the "driver's seat" in the learning process and will own the knowledge thus acquired--knowledge that moreover would then be adapted to the client's local environment.

In other words, even if the Bank has the right knowledge--and that is no small "if"--it is the wrong pedagogy to try to "transmit" it to the clients. The Bank needs to play more the role of the Socratic guide and midwife to strengthen the powers of critical thought and independent inquiry in the clients and to promote the clients' own self-directed learning program--so the clients will discover appropriate knowledge themselves. Then the knowledge is locally owned as well as adapted to local conditions. The Bank's penchant to transmit catechisms does not help this learning process; in fact it hurts the process of autonomous learning on the part of the clients by promoting, implicitly if not explicitly, tutelage and belief based on authority.

## References

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