TEACHING TECHNICAL SUBJECTS TO ADULT LEARNERS

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The Information Age is upon us and American businesses are trying desperately to keep abreast of current developments. Accountants, engineers, economists, managers, and supervisors are turning more and more to the power of the personal computer and large mainframe to help unravel the mystery and harness the power of corporate information. Computing power has escaped the Data Processing Department and found its way to the desk of many employees. The challenge facing most companies today is how to successfully train non-data processing employees to use the powerful tools they have at their fingertips.

Most large companies are at least making the attempt to provide this needed training through the auspices of the Information Center. Information Centers have employed a variety of instruction methods in order to fulfill their goals. Such methods have included live classroom instruction either on or off site, computer-based training, commonly termed CBT, or as either the first or last resort, the dispensing of a manual with a cover letter containing instructions on how to access the software the person will be attempting to learn. All of these attempts have met with varying degrees of success.

As a rule the people chosen to staff the Information Center as trainers for live classroom instruction or the developers of computer-based training are the technical people once destined to spend their time safely with the Data Processing Department, protected from the accountants, engineers, managers, and clerical staff who are now dependent upon them to provide the education necessary to use the new tools available. Their task is not an easy one. Providing the training necessary for every employee to successfully use the software available today, with all of its power, is not simply a matter of handing out manuals and installing equipment.

Although it is easy to see why technical people are the logical choice for a trainer, --i.e., they probably already know everything there is to know about the particular piece of software,--several very important aspects of providing a successful learning experience are generally outside their experience. The problem then is that although these people know how to quickly learn any new software product, they really do not understand why or how they were able to acquire this new knowledge, and because of this lack of understanding, they are at first, generally unable to successfully transfer their knowledge to the perspective student.

Nothing is more disheartening for trainers than spending several days standing before a group of fellow employees, outlining for them everything that is necessary in order to return to their office ready and able to use a new piece of software, only to realize at the end of the course that every face is blank, and that the silence mistaken for rapt attention was extreme boredom, or even worse, a sense of complete bewilderment. The technical trainer, faced with this result time after time, will more than likely transfer the blame either onto the student with the comment "that person is incapable of learning anything new," or turn the blame inward with feelings of inadequacy. Both responses can be avoided when a complete understanding of the adult learning process is explored.

First, it is important to understand one key element in the learning method that most technical people use when first exposed to a new piece of software or a new programming language. This learning technique is usually employed unconsciously, and unfortunately, it is probably the foremost reason the technical person is unsuccessful as a trainer his first couple of times at the front of the classroom. When first exposed to something new, the data processing professional promptly compares the new with his previous knowledge, thus focusing on what is really new, compared to that which is only slightly different from what he already knows. While this technique works well in the learning of new software, it fails miserably when applied to developing course material for adult education.

Why is this the case? The trainer naturally draws upon his knowledge base, and where did this knowledge base concerning education develop from? Naturally, his experiences in school as a child, teenager, and college student. So even without knowing it, the trainer, when developing his course material draws upon what he is familiar with, the traditional learning model, commonly called the Pedagogical Model.

Pedagogy, which is defined as "the art and science of teaching children" (Bolton 403), is the one we have all had the most experience with. In fact, it is the only way of thinking about education that most of us know. The Pedagogical Model consists of five basic components:

1. The learner is dependent upon the teacher. The teacher has the full responsibility for making all the decisions about what should be learned, how and when it should be learned, and whether it has been learned. The only role for the learner is that of following the teacher's directions.

2. Learners enter into the education activity with little or no experience that is of much value as a resource for learning. It is the experience of the teacher that counts. Of necessity, the teacher's ability to transmit this knowledge through lectures, assigned reading, and audio-visual presentations become as important,
if not more so, than the material being presented.

3. Students become ready to learn what they are told that they have to learn in order to advance.

4. Students see learning as a process of acquiring prescribed subject matter content. The course content must be sequenced according to the logic of the subject matter.

5. Students are motivated primarily by external pressures from outside, parents, other teachers, competition for grades, the consequences of failure, and the like (Knowles 8-9).

Malcolm Knowles, over a professional career of fifty years devoted to adult education, has explored the field of Andragogy. The word, not found in a dictionary, was first used by European adult educators to mean "the art and science of helping adults learn" (Bolton 403). Knowles' new approach to learning has the following five basic components:

1. The learner is self-directing. Often subconsciously, when put in learning situations where others are imposing their wills, the adult learner will become resentful and resist the learning experience.

2. Adults enter into the education activity with a greater volume and a different quality of experience from the young.

3. Adults become ready to learn when they experience a need to know or do something in order to perform better on the job or improve some other aspect of their lives.

4. Adults enter into the educational experience with a task-centered, or problem-centered orientation to learning. They learn in order to be able to perform a task, solve a problem, or live in a more satisfying way.

5. Although adults do respond to external motivators—a better job, salary increase, more leisure time—the most important motivators are internal; self-esteem, recognition, more self-confidence (Knowles 9-12).

If we accept the research of Malcolm Knowles in developing his Andragogical Model, it becomes clear why so many trainers fail when their courses are developed with the Pedagogical Model as a base.

Based on what is known about the adult learner, instructions that encourage independence, specific application orientation, and recognition of individual differences will generally accomplish more than those that do not.

Before the trainer rushes into the development of all new material he should be aware of several special problems that need to be addressed with his new material. Although adult learners are self-directed, the minute they walk into any situation labeled "training," they have a tendency to fall back on their early conditioning in school, even though this method of learning will no longer work with them. A conflict develops between their early conditioning and the desire to be self-directing. The trainer, finding himself confronted with these conditions, will, unless he does something to orientate the student towards the new approach, find himself with a class that is subconsciously expecting one method of instruction and receiving something completely different.

Instructors need to be aware that the wide range of experience within the group will mean that it will be very hard to keep the class moving at the same pace. In order to overcome this, group discussion, simulation exercises, and problem-solving projects should be developed in a way that allows each student to develop at his own speed.

By the time the student arrives in the trainer's class he/she has firmly established preconceptions about reality. The student will have developed certain ways of thinking and acting. The trainer must subtly develop techniques for opening the student's mind to new experiences.

Instructors most always assume that everyone thinks in the same way and that some people are simply better at it than others. Again the words, "that person is incapable of ever grasping the knowledge to use this piece of software. They will never be able to use a computer" begin to come to the front of the trainer's mind. It is important to remember that we each have our own learning style. Some people visualize easily and clearly; others have difficulty generating a clear visual image. Linear, analytical thinking is easy for some people, difficult for others. The following example will illustrate the different possible approaches towards problem solving and learning.

A man and a woman are standing side by side with their weight on their right feet. They begin walking so that each steps out on his or her left foot. The woman takes three steps for every two steps of the man. How many steps does the man take before their right feet simultaneously reach the ground? (Williams 42)

Many students will visualize the two walkers. Some will see the footprints. This approach uses the strategy of visualization.
Other students will draw or diagram the patterns the walkers' feet would make. Still other students will need to use their fingers to simulate the walkers, or will have to actually mimic the walkers. The problem can also be solved either mathematically or verbally, although these two methods will take longer than the first two (Williams 43).

Instructors need to carefully develop course material in such a way that each style of learning and problem solving is addressed. Each new piece of material needs to be presented to the student in several different ways.

Course content that does nothing more than convey information is not effective. Instructors who fall into that trap will begin to see very revealing comments on their course evaluation forms. Comments will vary from "I sent this employee to your three day course and he cannot apply anything he has learned," "some of the information was useful, but most of the session was over my head," "too many lectures and slides," or the worse comment of all, "I know most of that stuff before I came to the class."

Although based on the material already presented it can be established that learning experiences which encourage independence, application orientation, the recognition of individual differences will create a strong "adult learning" climate, four key steps are involved in the development of this type of program. These steps revolve around understanding and respecting the adult learner and creating a positive consultant/client relationship (McLagan 12).

First, develop the program with the understanding that the students will have to take their learning out into their working world, and that the instructor will not be readily available to help them. The teacher's obligation is to provide situations in which the learners see a broader and broader range of problems and from which they learn the ability to seek and formulate their own problems (Gibb 59).

Second, establish at the start of the program that the responsibility for the success of the class must be shared. The student and the teacher each have their own responsibilities. The trainer must analyze the group needs, and in the case of teaching a new software package, do the technical research, organize the information into manageable units, present just the right amount of information, and develop exercises that will promote learning (McLagan 13).

But the learner must in turn analyze his own needs, customize the general objectives of the class to those needs, be congenial to new behaviors, and most importantly, apply the learning to the work environment (McLagan 13, Gibb 59-60).

The trainer must design activities that encourage learners to define their own personal objectives and then help them to plan applications of this knowledge. Most importantly, the trainer must design the class to allow interaction with the learners. The physical environment should encourage sharing. The trainer must be empathic. Confront and challenge, but only after mutual respect has been established between the student and the teacher (McLagan 14).

Teaching, for the technical expert, can be a great experience. He need only focus on what gets learned, rather than what gets taught (Margolis 52). The teacher functions as a facilitator whose tasks are to create a supportive environment in which the learner is free to take risks and "to draw out, not pour in." When the teacher functions in this manner, education becomes a cooperative art (Conti 222). Properly done, the experience can be as rewarding for the technical expert as any computer program he has ever written, or system he has designed. Every teaching experience can in turn be a learning experience for the instructor. And that is what adult education is really all about. Learning from every experience.

Works Cited


