FOUR STEPS ARE NO LONGER ENOUGH

a systems approach adaptation of J.I.T. for the 1970's

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"Our assumption is that you are interested in turning out graduates who can perform effectively on the job, and that you are interested in being able to demonstrate your success in doing so."[1]
Robert Mager and Kenneth Beach

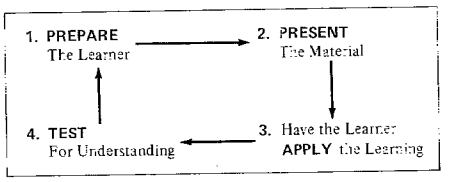
Nostalgic conversations at gatherings of training people in the over-40 crowd often seem to focus on the World War II heydays when trainers and training directors were becoming an integral part of organizations. The large numbers of new workers needing to learn to build "guns" created tremendous pressures for speeding up the learning process for job training. From this need, a systematic procedure to train workers was adopted. J.I.T. (Job Instruction Training) was implemented and proved a successful procedure. Probably the main reason for its success and durability is that it has a sound basis in learning theory. Also, it is easy for both supervisors and instructors to learn to use. The four-step procedure of J.I.T. is similar to the (Figure 1) model.

This procedure is still used[2] and it's very useful. But, the 1960's have seen a shift of focus (especially with adults) from what the *instructor does,* to what the *learner does,* from looking primarily at instructor behavior toward emphasizing learner behavior. This change has been aided by the impact of programmed instruction.[3] In the case of programmed instruction, the emphasis is entirely on learner behavior. There is no question that this emphasis is making numerous contributions to training people more effectively in less time. This obviously means savings in money and valuable management time. Programming forces one to systematically think through what he is trying to accomplish in training, and to spell it out in terms of desired terminal behavior in learners.

J.I.T. AND TERMINAL BEHAVIOR

This article joins the new emphasis on learner terminal behavior with the J.I.T. four-step procedure. Many instructors and supervisors now use the J.I.T. process on the job. Can it be made a more effective system? Yes. We've found that

Figure 1



the concepts of objectives and evaluation strengthen the J.I.T. process.

This article describes an expanded six-element instructional process which has proved useful to instructors[a] and to supervisors in providing efficient and satisfying learning experiences for their students and employees.

The expanded process adds two elements[b] to the J.I.T., four-step process. The model, now with six steps[c] (1. Objectives, 2. Preparation, 3. Presentation, 4. Application, 5. Test, 6. Evaluation) is shown in Figure 2.

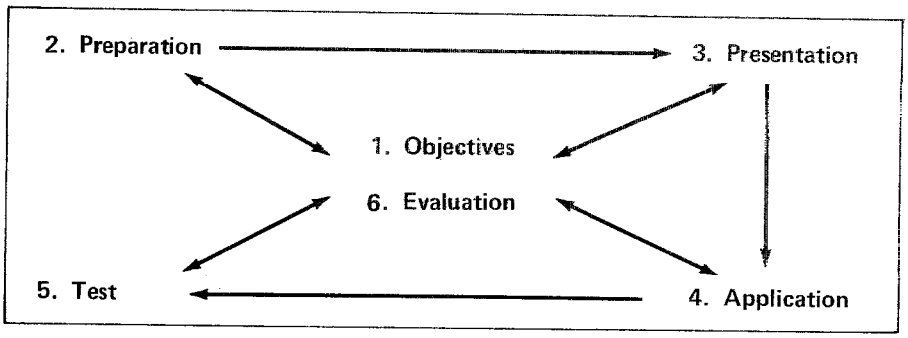
This is a model of an Instructional Process (a systematic way to approach teaching). It's neither a step-by-step procedure to use in preparing a lesson, nor a model of how people learn. It's a frame of reference for organizing and teaching adults, singly, or in small groups. For me, the model is a vehicle for planning and for keeping on target. The two additional steps were implied but not clearly stated in most of the early systematic models. One instructional system, described by R. W. Selvidge[4] in 1934, had the first step as a "clear and definite statement of the

[a] The Instructional Process model is used as a foundation for a five-day Instructor Training Workshop conducted in the Chesapeake and Potomac Telephone Companies. It is taught to instructors who teach a wide variety of management and worker courses.

[b] I am indebted to Mr. Barry O. Smith, District Commercial Manager, C & P. Telephone Co. of West Virginia and Mr. McPherson G. Hoffman, District Commercial Manager, C. & P. Telephone Co. of Md., for some of the original ideas in formulating this model. Mr. James Pavlakis did a yeoman's job of editing for me.

[c] I've used the terms "element" and "step" interchangeably. Because of the interrelationships of the various parts of the model, "element" is a more appropriate term.

Figure 2



problem or job." This begins to approach today's concept of objectives but leaves much unsaid.

SPECIFICITY

The integration of objectives and evaluation into the four-step J.I.T. model aids an instructor to be more specific in his expectations of what his students should be able to do when the learning experience is completed. What learners are expected to do is called "desired terminal behavior." The advantages of this specificity are:

1. It helps the instructor eliminate unnecessary material that takes up precious time.
2. It encourages stronger positive motivation in the learner. He clearly understands what he is expected to be able to do and under what conditions he will be required to do it. Thus, the learner can take a more active role in his own development.[5]

OBJECTIVES

What is an objective? In order to be definite about objectives, it helps to differentiate between an instructional objective, a teaching plan, and a course description.[6]

Course Description. A statement describing the content and methodology of a course. An example is:

> "This is a laboratory course in public speaking where the students take an active role by giving speeches to one another."

Teaching Plan. A statement describing what the instructor does. A teaching plan for a segment of the above course might look like this:

> "Assign each student a different topic. Allow them to decide for themselves who should go first. Stay out of the speakers line of vision and don't interrupt or offer any help until the student's allotted speaking time is up."

Instructional Objective. A statement describing what the learner is expected to *do* in terms that describe behavior (actions). An example of a possible action objective for the preceeding course description and teaching plan is:

> "The student is expected to write and present a ten-minute speech, on an assigned topic, to the rest of the class. The speech should conform to the format described in the text."

This objective, when given to a student, leaves little doubt in his mind of what he has to do. The course description and teaching plan are open to wider interpretations.

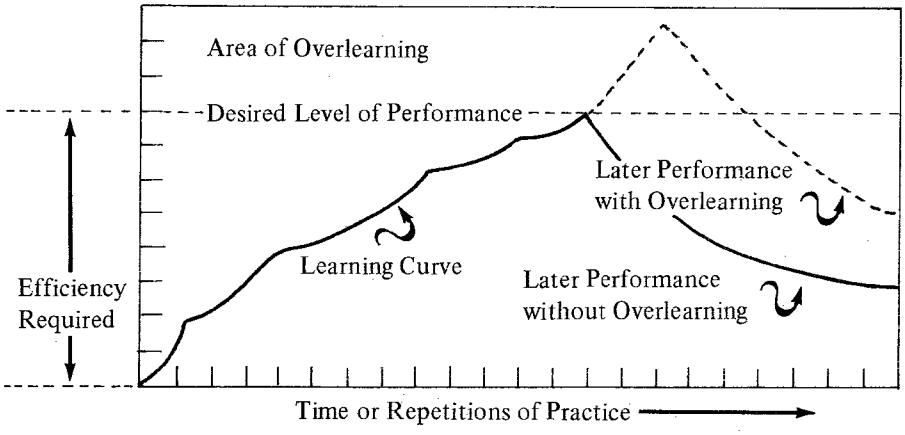
To further define Instructional Objectives in "Magerian"[7] [d] terms:

1. A statement of instructional objectives is a collection of words or symbols describing educational *intents.*
2. An objective will communicate intents to the degree it describes what the learner will be doing when demonstrating his achievement and how one will know when he is doing it.
3. A description of desired terminal behavior (what this learner will be *doing):*
   a. Identifies and names the overall behavioral act.
   b. Defines the important conditions under which the behavior is to occur (gives and/or restrictions and limitations).
   c. Defines the criterion of acceptable performance (how well the act is to be performed).

It's important to be concerned about specific objectives, because if they don't spell out measurable actions that can be seen in the individual completing the learning experience:

1. It's impossible to accurately evaluate the effectiveness of the time and effort devoted to a learning experience.
2. There is no reliable way to know if the program is worth the money spent on it or not.

Figure 3



[d] "Magerian" is a term coined to represent the approach to objectives advocated by Robert F. Mager.

3. There is no systematic basis for selecting appropriate texts, materials, training aids or methods of instruction.
4. Tests are often irrelevant, meaningless and do harm by generating student frustration.

EDUCATION VS. TRAINING

At this point, I run the risk of generating very valid arguments between the sometimes conflicting camps of "education" versus "training."

Education advocates will resist being specific on the basis of being too limiting to the learner. This can be resolved if we tentatively accept the definition of training as "trying to add to or improve upon a specific behavior" (such as typing) and the definition of education as "providing a broader range of behaviors for an individual."

It's probably impossible, or not worth the effort (at this point in time) to specify all of the behaviors required for a complex job like teaching, engineering or managing. However, this doesn't mean that some of the behaviors needed can't be specified. My hypothesis is: if we specify all the actions we can, the learning process will be enhanced. Our students themselves will help develop those that are unspecified.

As we move now through the remaining elements of the Instructional Process, we'll see how Objectives serve as a foundation for the entire model.

THE PREPARATION STEP

In the Preparation Step, there are three areas of preparation to consider: Preparing the Instructor, Preparing the Environment, and Preparing the Learner.

The instructor's preparation starts with determining the specific behavior he wants his students to learn (objectives). I can't emphasize enough the necessity for fixing the desired terminal behavior in the instructor's mind. When this is accomplished, and not until it is, can he rationally select methods, training aids, texts, and other material. Then, a lesson plan should be developed. When the objectives, tests, and lesson plans are completed and checked against the objectives, the instructor is ready to concern himself with Preparing the Environment.

Physical requirements, like lighting, heat, ventilation, training aids, adequate chairs, work space, tools, equipment, etc., can be quickly checked, and are usually no problem for instructors who know the job to be taught. When working with adults, it's important, whenever possible, to avoid the traditional classroom arrangement with the teacher in front[8] and all students facing the teacher. The traditional set-up focuses all communications toward the teacher and limits communications between the students. To learn most effectively, adults need to participate and interact with their peers as well as the instructor. Thoroughness in preparation by the instructor of himself and the environment are important parts of preparing the learner. A well organized and comfortable classroom will indicate efficiency, help put the learner at ease, and reduce apprehensions about the value of the pending learning experience.

The instructor can further prepare the learner[9] with his words and mannerisms. He can demonstrate an interest in the learner by really listening, and being informal. It often helps if the instructor smiles. If the class laughs, it's usually a good idea to be natural and laugh with them. A well organized, efficient, and enthusiastic instructor usually influences his students to become enthusiastically involved in their own learning.

LEARNER PARTICIPATION

Another important item in preparing adult learners is allowing them to participate in setting some of their own learning objectives.[10] This involves having some kind of activity (in dyads, triads or small groups of four to six) where the participants are asked to list their goals or their expectations for the learning experience and share them with the other subgroups. Activities like these help reduce early group concerns and anxieties by discussing common goals and interests. They also encourage the learner to become personally committed to the learning experience.

There's a direct correlation between personal objectives and positive motivation and it's a constructive use of time to allow learners to do this. Integrating the objectives of the individual with those of the instructor and the organization sponsoring the training is especially needed with adults.[11] They usually have the freedom to withdraw, if not physically then psychologically, from the situation if they choose. Adults tend to see themselves as autonomous and independent individuals.[11] Imposing objectives upon them, without allowing them to have a say in at least part of them, frequently causes people to withhold their commitment and resist the instructor and the situation.

It's also important to announce time schedules and break arrangements early so independent people can plan their time.

Sharing with the learner the "rewards system" of the class, (grades, tests, evaluations and what information will, or will not, be given to others outside of the class) aids adults to become more comfortable in a learning situation. My own bias is to reduce individual competition as much as possible by not giving grades. Or, if grades are used, make one of the objectives cooperation and base part of the grade on cooperative behavior. People are expected to cooperate on the job, why teach them to compete in the classroom? If some form of evaluation is unavoidable, then a simple pass or fail grade (assuming there is no curve grading and all can pass) seems to contain interpersonal competition.

LEARNER CONCERNS

A necessary step in preparing the learner is to provide an opportunity for students to get to know one another. Some type of introduction will begin this process. We learn to be modest in our culture, so it's a good idea to have adult

learners introduce someone else. This allows more relevant information to be shared in the group, as it's more proper to talk about the assets of someone else.

Safe assumptions for the instructor to make about adult learners' concerns are that they wonder about: (A) their chances for successful accomplishment; (B) the influence of the other students; (C) what kinds of rewards and punishments the instructor will provide; and (D) how much influence they will have on the outcomes of the training.[12] If the instructor recognizes that he also has some similar concerns, he is more likely to be patient and provide information and time for the learners to reduce these obstacles to learning. This dictates that time should be devoted, early in the learning experience, to clarify misunderstandings, and let the learner know what's in it for him.

The overlapping between the objectives and the preparation are evident. Part of preparing the learner involves letting him in on and letting him set some of the objectives. Overlapping between elements appear all through this six-step instructional process. They merely serve to demonstrate that the model is not a clear-cut mathematical model, but only a systematic approach to help focus an instructor's thinking on important considerations. Nathaniel Cantor[10] captures this conflict with his statement,

> "The complex problems of teaching and learning and the limitations within which we carry on our teaching activity do not permit of any simple or single answer or even a series of formulas. The recognition of limitations, however, must not be converted into justification for ineffective teaching."

PRESENTATION STEP

Let's move on now to the next element of the model. Presentation is the step where the main ideas and the key learning points are presented to the learner, or where a new skill or procedure is demonstrated. A variety of methods can constructively be used to tell, show or illustrate the new ideas. Lectures, demonstrations, role plays, films, slides, sound recordings, programmed texts, reading assignments and having students present material to one another are all appropriate for adults. Methods need to be varied and appropriate to the objectives of the situation.

Experienced instructors frequently become so good at their subject that they teach "over the heads" of their students. This tendency can be counteracted by:

1. Giving a broad overall picture in general terms.
2. Presenting new ideas in a logical sequence.
3. Determining, stressing and repeating key points.
4. Frequently demonstrating how each step fits into the overall picture.
5. Going slowly, giving only as many new ideas as the learner can absorb.
6. Internalizing the lesson plan. (Internalizing involves going beyond memorizing. Internalizing means making it part of the instructor's natural behavior. This is only accomplished through constant practice. The old adage "do as I say; not as I do," doesn't work any better with adults than it does with children. Individuals teaching adults must be prepared to demonstrate their own skills.)
7. Evaluating the presentation against the learning objective before making it.

To avoid duplication, it's important to find out what the learners already know before embarking on a detailed presentation. This requires asking relevant questions, or giving specific pre-tests.

The old principle – tell them, have them tell you, show them, have them show you – is sound, but care must be used with adults so the instructor isn't seen as talking down to the class. Sometimes, the principle can be reversed and creatively used by having them tell and show you. Matthew Miles[13] states, "The trainers central task is to assess the learning situation, decide which of several specific training functions is needed at any given point, and see that it is supplied either by him or by some group member." It matters not, who supplies the function as long as it's timely.

So far, I've tried to show how preparation and presentation are interrelated and dependent on having clear objectives. By reflecting back through the presentation and preparation elements, we can see that a clear statement of objectives read by the learner is also a form of presentation. As soon as adult learners have enough information to start constructive work on their own, they should be encouraged to do so.

APPLICATION STEP

This is the element where the learner performs on his own, with supervision. The phrase "with supervision" doesn't mean "watched closely." The intent of providing supervision is that the instructor provide enough observation and feedback to be sure the learner doesn't learn the wrong thing. Application is the learner's opportunity to do it for himself, learn it for himself and feel the stimulation of achievement. Adults have much higher needs to do something for themselves than do children.[11] Unless there is a safety hazard, or risk of damaging expensive equipment, adults should be allowed and encouraged to practice new knowledge skills and even attitudes for themselves.

Another side of the practice problem is when learners resist practicing and doing it for themselves. If adults are reluctant to practice it's likely they are afraid to fail or reluctant to show weaknesses to others. If this happens, opportunities should be provided for them to practice without the instructor observing. Practicing with a peer, who will encourage them, can frequently help. The concept of overlearning[14] is important for instructors to understand so they can help adult learners overcome mild resistance to practice and repetition. Resistance, based in boredom or a reluctance to reveal weaknesses, can often be overcome by gentle coaxing. Until an instructor can integrate the concept of overlearning into his own value system, he is likely to do his students a disservice by not

insisting that they practice new skills. The overlearning concept is: Learning tends to diminish rapidly immediately after a skill[12] is learned.[15] This lack of retention can be compensated for by requiring learners to perform at a level above the ultimate desired level. The graph, Figure 3, demonstrates sustained performance at a higher level after skill above the desired level is developed. Typing and shorthand speed is a good example of this situation.

TOLERATING FAILURE

With any new knowledge or skill, mistakes are to be expected and adults frequently can recognize these themselves. "We learn by our mistakes," is an old cliche, but it's most appropriate. Of course, we need to recognize our mistakes.[14] A climate where failure (mistakes) is tolerated will often speed up learning.[16]

If adults have difficulty catching on, an effective technique is to have them perform step-by-step and ask them to explain what they are doing as they go. This technique makes use of one of the oldest known concepts of learning. That is, to get many senses involved in the learning process as possible (sight, sound, smell, taste, touch and feelings). The concept is based on the facts that people will generally remember:[e]

10% of what they read
20% of what they hear
30% of what they see
50% of what they hear and see
70% of what they say
90% of what they say as they do something

If accuracy is important in the terminal behavior, most instructors will emphasize accuracy first. People frequently get impatient and want to speed up. Generally, when a person learns to perform accurately first, it's easier to improve speed later. To my knowledge, this has never been proven true for all people, so I try not to get locked in and force learners to always work on accuracy first. If the learner wants to work on speed, I'll usually go along with him.

FEEDBACK

Where the objective is to develop a conceptual understanding, rather than a specific skill, the application step becomes the learner's responses to appropriate questions[17, 18] that encourage discussion of the concept. Feedback[18] comes to the learner in indirect ways in group discussions, and allows him to adjust his thinking as he reacts to other's ideas. Lee Bradford's comment "adults learn by doing only under conditions in which relevant, accurate and acceptable feedback gets through to them"[16] is an effective climate to shoot for.

Learner discouragement often sets in as a learning plateau (a temporary pause in improvement) is reached. The instructor needs to provide support and encouragment when this happens.

Learner application is so crucial to establishing changed behavior that it's hard for him to understand why practice and group discussions are often eliminated just to be able to complete the material in the instructor's notes. Methods involving actual performance on real equipment or mock-ups, in role plays, in discussions, taking tests, solving case studies or sample problems, as well as programmed instruction all allow students to apply and practice new learning. It's important to evaluate the application method chosen against the terminal behavior desired. If evaluation is ignored, instructors tend to use familiar and comfortable methods that are frequently irrelevant to the objectives.

TEST STEP

When sufficient time has been given to application, a test is often appropriate. The test element is where the learner does it on his own. Used properly, tests are a source of motivation as well as an evaluation of instructor and learner performance. *Not all people like tests, but most people like to do well on them.*

With adults, cautious use of tests is advisable. If they are seen as unfair, irrelevant to objectives or used in a manner that will negatively affect an individual's future, they can create resentment and actually inhibit learning. People can often spend so much energy learning to pass tests they don't learn other necessary information or skills. If the whole class does better on the instructor's second test than his first, it's a good sign they have "psyched" the instructor rather than learned new behavior.

A test is a vehicle for checking along the way, as well as final check of whether the learner has achieved the objectives.[19] In any case, the learner should be required to do it on his own. If he cannot perform adequately, a recycle to the presentation step for more information or to the application step for more practice is needed. Tests can be another form of application or practice which aid in retention. If a test is to aid in learning, the learner needs feedback on results of the test.[20]

Effective tests measure performance in terms of the objectives. Oral, written or performance tests are usually useless if they don't accurately measure the desired terminal behavior. Determining tests, before choosing methods and materials helps. Instructors can more efficiently use class time to focus on what learners will be measured on. Where the objective involves development of skills, caution should be exercised in using paper and pencil tests. It's unlikely that skill development can be determined without a performance test.[14]

Tests can detect instructional flaws as well as student errors, and should be used to improve the preparation, presentation and application methods.

EVALUATION STEP

While Evaluation is listed as the final element in the model, in reality, it's a continual function as indicated by the double ended arrows. All through the

[e] Don't hold me to these exact percentages. They are used to demonstrate a point. Obviously, any statement about all peoples' memory is impossible to prove.

learning situation, the instructor should reflect on and evaluate each element in terms of the objectives. After a lecture, a few minutes thinking about the learners reactions and the presentation's relationship to accomplishing the objectives can aid in improving the next presentation. Evaluation is usually thought of as evaluating the student. In this model it's used to evaluate the entire learning process and as a self-evaluation for the instructor. A complete evaluation after the conclusion of the learning process can uncover less obvious weak spots, inconsistencies, possible additions or deletions and necessary time adjustments. In all six steps in the instructional process, the terminal behavior desired in the learner serves as a foundation for evaluation and improvement.

SUMMARY

I've tried to emphasize the use of logical systematic approach by instructors. It's important both for learning efficiency and for learner satisfaction. However, I don't advocate a slavish adherence to the model presented. The six elements are neither clear cut, nor exhaustive. They overlap, and unpredictable factors will affect any learning situation. Different learners will respond differently to the same subject matter, and a perceptive instructor will evaluate feedback on learner progress and modify his approach. The steps even vary between learners. Some students will mentally be in the application step while the instructor makes the presentation. At the same time others might be trying to determine what the test will be, and some could still be trying to figure out the objectives.

Another caution about this model relates to developing entire courses. The system described is not sufficient for course development because research on the knowledge or skills needed is not included. An underlying hypothesis to effective use of this instructional process is that the person doing the instructing has adequate knowledge of the task, job or subject being taught. Otherwise, research is needed to obtain it. Instructor's experience in doing or supervising the job being taught is sufficient.

Using the process of objectives-preparation-presentation-application-test-evaluation won't solve all teaching-learning problems. But, its use will make the learning situation more efficient for the instructor and the sponsoring organization and more satisfying for the learner. While I've emphasized this process in teaching adults, there is no evidence that it won't work with children.

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JOBLESS TO GET TRAINING IN REHABILITATION OCCUPATIONS

Rehabilitation centers and other health facilities will become work sites for 500 jobless or underemployed persons who will get on-the-job training (OJT) in health-care occupations under a Manpower Development and Training Act (MDTA) contract announced by the U. S. Department of Labor.

The 18-month contract with the International Association of Rehabilitation Facilities, Inc., formerly the Association of Rehabilitation Centers, Inc. (ARC), is supported with $500,000 in Federal assistance.

About 375 jobless persons will be trained for 4 to 26 weeks in subprofessional and nonlicensed occupations in the rehabilitation field, while 125 selected permanent employees will receive skill upgrading for about 20 weeks.

The occupations include rehabilitation nurse aide, physical-therapy aide, home-care aide, recreation aide, activity-program aide, psychiatric aide.