Training Program Design

An Exercise in Developing Training Objectives by Specification of Terminal Behaviors

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The need for training in industrial organizations is constantly growing more critical. Jobs are becoming more technical. New methods and new knowledge is being developed constantly. Education within the organizational structure must change. Instructional content changes to keep current with the times. Methods of instruction must also change to keep up with new educational developments. Since more and more is being asked of industrial educators, methods of instruction are of increasing importance. More education must be accomplished in less time. Instructors are being required to ask themselves,

"Am I accomplishing with my instruction all that I had intended to accomplish? Can this be accomplished more effectively and more efficiently in any other way?"

This search for efficiency and effectiveness will certainly result in a shocking revelation for many educators. One cannot determine efficiency and effectiveness until the behavioral changes which the instruction was intended to produce have been specified. In the search for efficiency and effectiveness, many educators will discover for themselves that in the past, they have seldom specified the changes which they intended to make in the

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learner's behavior.

The fact is, educators have not given sufficient thought to their product before. Their emphasis has been upon *content*—(*what* they teach) and their *techniques* (*how* they teach) and not on what the learner *learns*.

Furthermore, educators are so much in the habit of emphasizing their content and technique, that it is very difficult for them to change their methods to give more emphasis to what the learner learns. Stimulated by the well known industrial necessity of "increased production" (more learning) at "decreased cost" (less teaching), however, they are being forced to inspect and revise their methods. Learner efficiency is of increasing importance. Specific behavioral changes in the learner in less training time is the mandate from management.

This article presents a systematic approach to training which places emphasis upon what the learner learns. Learning is seen to be the independent variable and teaching is the dependent variable. Instead of "given this bit of teaching, what learning occurs," we ask, "given this bit of behavior, what must we teach to enable the learner to acquire it?" We ask, "For this bit of behavior, what teaching do we need?" rather than "With this bit of teaching, what behavior can we get?"

Stating Objectives

Our approach¹ insures that whatever is taught is relevant to the achievement of the desired behavior in the learner. The teaching materials and techniques are chosen for their relevance to this end and for no other reason. After deciding what we want the learner to be able to do, then we

choose the best teachers, the best information, the best training aids, and the best teaching techniques which will *cause* the learner to acquire that behavior. This is a much more systematic approach to the development of training programs than has existed in the past. In this approach, the teacher decides what behavior he wants the learner to acquire, then decides upon the best way to get the learner to acquire it. Knowing what you want before you go shopping makes much more sense than going shopping to see what you can get. Likewise, specifying the result of a training experience before designing a training program makes more sense than designing a training program to see what you can get.

Specifying the outcome of a training program as a first step is really only stating your objectives. Objectives are what you wish to achieve through the training. They are your goals-the end product of the training. They are not the training itself, which is obvious, and yet, very often educators will confuse things that they intend to do and course descriptions with training objectives. Obviously, anything that the instructor does in the program is not a training objective, but a means of achieving a training objective. We don't train or educate just to be training or educating, but we do these things for a reason-to achieve an objective-which is to cause pre-specified changes of behavior or acquisitions of behavior in the learner.

Teaching Plan

When a teacher tells a child that 2+2=4, it is not the teacher's objective to tell the child that 2+2=4. The

^{1.} R. F. Mager. "Preparing Objectives For Programmed Instruction," Faron, 1962.

teacher's objective is to get the *child* (the learner) to say 2+2=4, or more generally, "to be able to add one digit numbers arithmetically." Any instruction that the teacher gives, and ideally, anything that the teacher *does* is a means of assisting the learner to achieve an objective rather than being an objective itself. The teacher's behavior is part of the teaching *plan*. Training objectives are statements which specify learner behavior.

You will recognize the examples below as things the teacher plans to do, or part of a teacher's plan to achieve an objective; and yet these statements have been stated as objectives:

To give the individual opportunity to assess his written communications in terms of the "Fog Index."

To reinforce the learner's correct response, and have the learner correct his own errors.

These statements clearly describe behavior which is to be carried out by the teacher. They are part of the teacher's lesson plan. Another kind of inappropriate statement which is often found in lists of training or educational objectives is similar to this:

Participants take part in sub-group discussions of samples of written, correspondence and determine the most appropriate action to be taken. Following each sub-group discussion is a group discussion.

Such a statement describes the format, procedure, and content of a training experience which the learner will have. It may mention behavior which is expected of the learner, but this behavior of the learner's occurs *during* the training and is, in fact, part of the training. The statement would be most accurately called a "course description" rather than a training objective. A training objective describes behavior which the learner will be capable of at the end of a learning experience. It specifies:

Terminal Behavior—what the learner will be able to *do* if the training is successful.

Conditions—the circumstances under which the terminal behavior is expected to occur.

Minimum Level of Achievement the quantity and quality of the terminal behavior which the instructor will accept as evidence that the learner has acquired the behavior.

Objectives of this Article

For example, consider the following statements which are the training objectives of this article:

1. Given a list of statements composed of training objectives, course descriptions, and instructor's plans, and the labels "Training Objectives," "Course Descriptions," and "Instructor's Plans," the reader will be able to correctly label every statement without error.

2. Given a number of statements of training objectives, and the labels, "Minimum Level of Achievement," "Terminal Behavior," and "Conditions," the reader will be able to label the main parts of all the statements without error and identify which parts are missing in any statements which are not complete.

3. Given the main parts (Condition of Assessment, Terminal Behavior, and Minimum Levels of Achievement) of two training objectives, the reader will be able to combine these parts to produce two complete, grammatically correct, realistic, and unambiguous statements (or paragraphs), each of which communicates a complete training objective.

4. Given a blank Training Objective Worksheet, the reader will be able to complete each item in the worksheet with an appropriate entry. The reader will decide upon the conditions of assessment, terminal behavior, and minimum achievement level for one of his own training objectives, and combine them to produce at least one complete, grammatically correct, real, and unambiguous statement (or paragraph) specifying a training objective.

Each of these four statements specifies behavior that you, as reader, will be able to demonstrate upon the completion of this article if our training objectives are achieved. The statements also specify the conditions under which these behaviors will be expected to occur, and the minimum level of achievement that you will be asked to demonstrate. For example, the first objective specifies:

Terminal Behavior-label statements Conditions-given a list of statements composed of training objectives, course descriptions, and instructor's plans, and the labels "Training Objectives," "Course Description," and "Instructor's Plans."

Minimum Level of Achievementlabel every statement correctly, without error.

First Objective

By now this first objective should already be almost reached, since you have already seen examples of course descriptions, instructor's plans, and training objectives and all of these have been described. Consider the following three statements which may properly be labeled "course description," "instructor's plans," or "training objective," but not necessarily in that order. Can you tell which is which? Before continuing, read the following three statements, think about them, and decide which each one is.

1. To introduce the basic elements in a learning situation.

2. A survey of company history, growth, and objectives, company or-

ganization, company products, personnel policies and procedures, salaried employees benefit program.

3. Without the aid of notes or other references, participants will be able to classify any given situation in terms of the categories of situations of problem analysis and decision making without error.

Have you classified them? If so, read on.

Only the last statement specifies a training objective. The first specifies some action that the instructor will take in order to achieve some unspecified objective. It is part of the "instructors plan." This kind of statement is frequently offered as a training objective. Obviously, this is not an objective, but part of the instructor's plan to achieve an objective, whatever the real objective may be. The real objective is not specified, though we might guess that it is about the learner's familiarity with the basic elements of learning.

The second statement is a course description. It describes the content and format of a new employee's orientation program as found in some companies. It fails to specify what the participants in the program will be able to do at the conclusion of the program.

The last statement specifies "classify any given situation" as the terminal behavior, "without the aid of notes or other references" as the condition, and "correctly" and "without error" as the minimum level of achievement.

If you could tell which statement was a training objective, and which was a course description, etc., then you already have a good start toward being able to write good training objectives. At least you will be able to distinguish your plans (that which you intend to do) from training objectives (that which the learner will do because of what you do as an instructor).

Review of Objectives

The objectives of this article, stated above, are worth repeating, because they tell you what to look for. The learner has a right to know exactly what he should be learning, and yet it is often the case that for some unknown reason the teacher keeps it a secret, perhaps because he doesn't wish to be accused of "teaching the test." You will note, however, that these training objectives are not test items, though they suggest test items and a test can easily be constructed from them. These training objectives specify behavior that you, as a reader, must acquire. It is important that you read them carefully, because later you will be tested on the questions which they suggest. We must assess your behavior to assure ourselves that our objectives are attained. We repeat our objectives:

1. Given a list of statements composed of training objectives, course descriptions, and instructor's plans, and the labels "Training Objectives," "Course Descriptions," and "Instructor's Plans," the reader will be able to correctly label every statement without error.

2. Given a number of statements of training objectives, and the labels, "Minimum Level of Achievement," "Terminal Behavior," and "Conditions," the reader will be able to label the main parts of all the statements without error and identify which parts are missing in any statements which are not complete.

3. Given the main parts (Conditions of Assessment, Terminal Behavior, and Minimum Levels of Achievement) of two training objectives, the reader will be able to combine these parts to produce two complete, grammatically correct, realistic, and unambiguous statements (or paragraphs), each of which communicates a complete training objective.

4. Given a blank Training Objective Worksheet, the reader will be able to complete each item in the worksheet with an appropriate entry. The reader will decide upon the conditions of assessment, terminal behavior, and minimum achievement level for one of his own training objectives, and combine them to produce at least one complete, grammatically correct, real, and unambiguous statement (or paragraph) specifying a training objective.

Second Objective

Before the second training objective can be expected to have been achieved, you must know what goes into a training objective (terminal behavior, conditions, and minimum level of achievement). These have already been mentioned, but now we will take each of them up in detail.

Terminal Behavior—what the learner will be able to *do* if the training is successful.

Notice that in the definition of terminal behavior, the word "do" is underlined. This is to emphasize the importance of specifying the terminal behavior in terms of observable action.

Look at the following two lists of verbs which might be used in the specification of a terminal behavior and see if you can notice the difference. Suppose that you specify that the learner will be able—

List One

to know

- to understand
- to appreciate
- to recognize
- to remember
- to be acquainted with
- to be familiar with
- to perceive
- to have knowledge
- to be aware of

to realize

- to comprehend
- to sympathize with

List Two

to write to recite to identify to differentiate to find to solve to construct to list to conduct to demonstrate to express to state

to choose

The difference between these two lists of words is that those in List One describe something that is happening inside the learner's head where others can't see it, while those in List Two are words which describe action. They are behaviors that can be observed.

In specifying a terminal behavior. vou should avoid the use of words which are subject to various interpretations. You should try to state what the learner will do in unambiguous terms. To say that the learner will "know" or "understand" something communicates very little. That does not mean that knowledge and understanding are unimportant, and certainly we often wish to specify this kind of behavior. But if words such as these are used, they must be further defined in terms of what the learner will be *doing* when he is "knowing," "understanding," etc.

For instance, suppose that a football coach wishes his players "to know the rules of tackling." He might lecture to them and tell them the rules but how can he tell when they "know" them? The point is that he can't. He can only accept some behavior from the players as evidence that they "know." He might wait to see if they tackle according to the rules, and accept that as evidence. More immediately, he could ask each of them to state or recite the rules. "Tackling according to the rules," or "stating the rules," or "reciting the rules," or "choosing from a number of alternatives the correct rules of tackling" are all observable behaviors which the coach might accept as evidence that his players "know" the rules.

In a nutshell, terminal behaviors must be stated in behavioral terms they must be observable, or defined in terms of behavior that is observable, so that you can tell when the learner has acquired them.

Deriving Terminal Behavior

Where do terminal behaviors come from? They come from the subject matter and stating what the trainees will be able to do at the end of the training. You must write them in consultation with the subject matter experts. When you write them will make a great difference in the development of any program you intend to construct. Terminal behaviors are part of your training objectives. Since training objectives should be specified before you begin to construct your program, the specification of terminal behaviors is the first order of busines in the development of any training program.

You must ask yourself, "What is it that I want the learner to learn?" or "What does the learner need to learn?" or "What is the learner not doing that he needs to do?" The terminal behaviors you develop should follow an assessment of training needs. A good assessment of training needs will reveal the terminal behaviors which you want to develop. Once terminal behaviors are developed, you will still need to decide how much of the behavior you want, how you will know when the learner has acquired it, and

how best to get the learner to acquire it.

Conditions—the circumstances under which the terminal behavior is expected to occur.

In each statement of training objectives should be a specification of what the conditions or circumstances are to be when the terminal behavior is expected to occur. Consider what materials will be given or provided for the learner that might assist him in demonstrating that he has acquired the behavior. What restrictions or limitations will be imposed if any?

Examples:

The latter approach to assessement has many advantages. For instance, if the football coach can determine which players "know" the rules of tackling before he puts any of them into a game, he need not run the risk of using players who don't know the rules. If he does "test" his players, he assumes that those who "know" the rules will tackle according to the rules —which may not always be the case.

Any assessment device should be a sample of the terminal behavior which is of primary interest. For instance, if "solve linear algebraic equations" on the job is the behavior of primary interest, we might be willing to accept the ability to "solve ten linear equations correctly in class" as evidence that the learner has acquired the ability to solve them on the job. In doing so, we predict that if the learner can solve them in class, he can solve them on the job, and that if he can solve these ten equations, he can solve any of the infinite number of equations which he might encounter on his job. The predictive relationship between ability to solve equations in class and on the job may be less than perfect, but solving equations in class will suffice as an assessment device to the extent that it does predict the ability to solve equations on the job.

Minimum Level of Achievement the quantity and quality of the terminal behavior which the instructor will accept as evidence that the learner has acquired the behavior.

Ideally, when you teach someone something, you would have him learn it completely. That's fine, but when we assess an individual's behavior, especially when we use a test to do this, errors creep into our assessment. It is impractical to ask anyone to "answer all test items correctly," or even to "tackle according to the rules *every* time," or "to solve *every* linear equation without error," because anyone can make errors, even the instructor.

Specifying the minimum level of achievement is sometimes a very difficult task. In doing this, we try to specify the number of errors we will allow the learner to make when he is demonstrating the behavior we want him to acquire. We also try to state the number of repetitions of this behavior that the learner must do to convince us that he has acquired the behavior.

If you were teaching someone to solve linear equations, would you be satisfied that the learner had acquired this behavior if he could solve 1? if he could solve 10? if he could solve 100? if he could solve 1000?

Would you be satisfied if he solved 900 out of a 1000, but arrived at an incorrect solution in the other 100? How much time should the learner have to solve 100 equations?

In specifying the quantity and quality of the behavior you want from the learner, you must consider all that is relevant to this behavior. If quality and speed are not relevant, then they need not be specified.

For example, a beginner's class in swimming may require the learner to "swim 100 yards." If nothing else is specified, it will make no difference how the learner goes through the water or how fast he goes through it. The task is apparently "free style," with no time limit. Quantity of swimming is the only concern. In a more advanced class, however, the instructor may require his learners to "swim 100 yards using the side stroke in less than two minutes."

The specification of the quantity, quality, and time allowed for the terminal behavior can become very technical with empirical determination, validation techniques, and other methods. The trouble you go to in doing this may depend partly upon the behavior being specified, who is learning it, your organizational or personal objectives, and many other variables. In any case, however, you must think about the quantity and quality and time allowed for the terminal behavior and try to specify them even if you can only do this arbitrarily. Even an arbitrary mark is "something to shoot for" and better than nothing.

Labeling

Now you should be ready to try the behavior which was specified in the second training objective of this article, i.e., to label the parts of a training objective. Given the fact that a training objective has three main parts, (condition, terminal behavior, and minimum level of achievement) see if you can label the parts of the two objectives below and state which part is missing if either is not complete. Study them, make notes in the margin and then continue.

1. After five hours of dual flight time, the student must be able to land the airplane safely without help from the instructor.

2. The student must be able to complete a standard Xerox 914 Copier Preventive Maintenance Report. The first statement is complete.

Conditions: After five hours of dual flight time, without help from the instructor.

Terminal Behavior: The student must be able to land the airplane.

Minimum Level of Achievement: Safely

The second statement is incomplete because it specifies only the terminal behavior. Neither the conditions of the behavior nor the minimum level of achievement are specified.

A complete training objective usually (but not always) has the following form:

Conditions—whatever help is provided or denied the student.

Terminal Behavior—what the learner must do.

Minimum Level of Achievement quantity and quality of the behavior expected.

Any form is acceptable, however, provided it makes sense. It is not necessary to combine all three parts of a training objective in a single sentence. For instance, the flight instructor's training objective, stated above, could reasonably be stated in three separate sentences.

The learner must be able to land the airplane safely. After five hours of dual flight time, he should be able to do this. This must be done without the aid of the instructor.

Components of Objectives

Whether you state a training objective in one sentence or many, it is helpful to think of a training objective as a complete expression of a single goal composed of three parts; condition, terminal behavior, and mini-

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mum level of achievement. This method will facilitate the specification of training objectives by allowing you to approach the task one part at a time. The first order of business is to specify the behavior, then specify the conditions and the minimum level of achievement in either order. Combining these three components into a single sentence or into a paragraph will produce a complete expression of a training objective.

Try to combine these components to make a complete training objective and write it down on a sheet of paper.

Terminal Behavior: Load and fire a rifle (M-1) at a target.

Condition: Given an M-1 rifle and two 8-round clips of ammunition at 200 yards from a standard target. Standing position.

Minimum Level of Achievement: Hit the target with all 16 rounds and score at least eight bull's eyes within two minutes from the command "Load and Fire."

Obviously, these elements can be combined in a number of ways. Compare what you wrote with our version. One way to do it would be to write out the training objective in one or more sentences:

Given an M-1 rifle and two 8-round clips of ammunition, the learner must be able to load the rifle and fire it at a standard target from a standing position. At 200 yards he must hit the target with all 16 rounds and score at least eight bull's eyes within two minutes from the command "Load and Fire."

Depending upon how the training objective is to be used, a simpler and perhaps even more communicative way to combine these components would be to bracket them and label the bracket "training objective." You must use your own judgment to determine the best way to state the training objective, but whatever you decide, you must bear in mind that the main concern in doing this is to communicate a whole idea.

Degree of Specificity

A training program will usually include the teaching of several thousand behaviors, and sometimes a large number of terminal behaviors will be involved. The development of training objectives can become an enormous job if you attempt to be too specific. For instance, the training objective specified above, "loading and firing a rifle," is too specific. The instructor probably is not so much concerned about the ability to load and fire a rifle at 200 yards as he might be about "ability to fire a rifle accurately at various ranges," and "ability to operate a rifle efficiently under various conditions." Training objectives can vary in the degree to which they are specific or general. If they are too specific, you will have too many. For instance, training objectives might be needed for slow fire, rapid fire, 100, 200, 300, 400, 500 yards with varying accuracy specified under each condition. If they are too general, there will be fewer of them, but they may not communicate much information like the following:

"At any range, the learner must be able to operate and fire an M-1 rifle with at least a minimum of efficiency and accuracy from various firing positions."

Neither range, nor efficiency, nor accuracy are specified. While the terminal behavior should always be sufficiently specific to be descriptive of what the learner will be doing, the conditions and minimum level of achievement may be more general, but they should not be so general that they specify nothing. The objective above, might well be re-stated as follows:

The learner must be able to operate and fire an M-1 rifle from various firing positions at various ranges from a standard target with at least the accuracy and efficiency specified in the chart below:

Firing Scores			
Required Accuracy	Under	Various	Conditions

Range	Standing		Sitting		Prone		Kneeling	
(yards)	Rapid	Slow	Rapid	Slow	Rapid	Slow	Rapid	Slow
100								
200								
300								
400								
500								

When you wish to assess a single behavior under many varied conditions, and the minimum level of achievement varies according to the conditions, a chart like this one can be very helpful.

Training Objective Worksheet

Before concluding this article, there remains one more objective to consider, that regarding the Training Objective Worksheet (See Figure 1). This is a worksheet which was developed to help in the construction of training programs. It organizes information and stimulates the program developer to consider some requirements of training that might otherwise be neglected. The following is a set of instructions for completing this worksheet. When you have read them, try to complete the accompanying blank worksheet by specifying an objective you have in developing one of your own training programs.

Instructions for Completing the Training Objective Worksheet

1. Training Category:

Specify the category of training to which the Training Objective below is relevant. (i.e. "Written Communications")

2. Terminal Behavior:

State as specifically as possible, *in terms of action*, the behavior you wish the learner to be able to demonstrate at the end of the training.

Examples:

ples: Calculate the Fog Index

Recall and write specific principles of better written communications

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Figure	1
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TRAINING OBJECTIVES WORKSHEET

۱.	Training Category:
2.	Terminal Behavior:
з.	What Must Be Provided?
4.	Training Techniques & Model:
5.	Practice Schedule:
6.	Reinforcement Schedule - What:
	When: How:
7.	When And How Will The Learner Demonstrate The Terminal Behavior?
8.	Minimum Achievement Level:
9.	Objective Statement (2+7+8):
10.	Assumptions (Why This Is Taught):

3. What Must Be Provided?

State the "inputs" or content of the instruction you will provide to enable the learner to produce the behavior you desire. What is taught? Be specific.

4. Training Techniques and Model:

Based upon your judgment and experience, specify the best way for training to proceed. How is the instruction presented? Consider the following techniques:

consider the following techniques.			
assigned project	drill, exercise	guided tour	
assigned reading	exhibit	lecture	
buzz groups	films	panel discussion	
coaching	film strips	quiz	
conference	flip cards	reading aloud	
demonstration	group interviews	role playing	

5. Practice Schedule:

After instruction has been given, the students should be given the opportunity to produce and practice the terminal behavior, if this is possible. Specify the circumstances of this practice. What is to be practiced? For how long?

6. Reinforcement Schedule:

Once the desired behavior occurs, it should be reinforced to increase the probability of its recurrence. Keep in mind the use of such general reinforcers as approval recognition, etc. Timing is important in reinforcement. Usually, reinforcement is most effective when it quickly follows the correct response.

7. When and How Will the Learner Demonstrate the Terminal Behavior? State the conditions of assessment:

When: at the end of training?

a	year	later?
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Where: in class? on the job?

what will you use for a

How: measuring device?

8. Minimum Achievement Level:

How much of the behavior in question shall we demand from the learner to satisfy ourselves that he has learned it?

For instance: Correct answers to (what percent) of questions asked.

(How many) correct applications of a technique.

9. Objective Statement (2+7+8):

Try to combine items 2, 7 and 8 to make one statement. This should yield a training objective. It need not be a single sentence or paragraph.

Example: (2) Terminal Behavior: calculate the Fog Index on a sample of writing of 200 words or more.

- (7) When and How: at the end of a program in Effective Writing, given a sample of writing 200 words or more.
- (8) Minimum Achievement Level: correct within rounding error.
- 10. Assumptions:

State why this behavior is important to learn. Is it a prerequisite

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to further learning? Do you assume that the behavior will transfer from this learning situation to the learner's job situation? What do you assume the learner must know before he begins to learn this new behavior? Having once acquired the skill, knowledge, or etc., will this stay with him permanently?

Summary

This article has discussed the need for stating training objectives before beginning to construct a training program. You need to know where you are going before you can discover the shortest route to get there. Training objectives, course descriptions, plans of the instructor, and the differences between these three kinds of statements were discussed. These three kinds of statements were compared with each other.

The component parts of a training objective were defined and discussed in detail. These are:

Terminal Behavior—What the learner will be able to *do* if the training is successful.

Conditions—The circumstances under which the terminal behavior is expected to occur.

Minimum Level of Achievement— The quantity and quality of the terminal behavior which the instructor will accept as evidence that the learner has acquired the behavior.

Four training objectives of this article were presented, and in the course of the reading, information and practice relevant to each of the behaviors specified in the training objectives were also presented. Finally, a training objective worksheet and instructions for filling it out were presented.

This approach to the construction of a training program will not be easier than other approaches, but it will ensure that the instruction you develop will be relevant to the goals you wish to achieve. It gets the results you want out in the open where anyone can plainly see them so that you need not "beat around the bush" with the learner about what you are teaching. It puts the horse before the cart.

