

Using Behavioral Objectives In Industrial Training

"knowing what you want before you go shopping"

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and
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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 are 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 effi-

ciently in any other way?"

This search for efficiency and effectiveness will certainly result in a shocking revelation for many instructors. 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 instructors will discover for themselves that in the past, they have seldom specified the changes which they intended to make in the learner's behavior.

The fact is, instructors 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 trainee learns.

Instructors 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 trainee 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. Trainee efficiency is of increasing importance. Specific behavioral changes in the learner in less training time is the mandate.

This paper presents a systematic approach to training which places emphasis upon what the trainee *learns*. Learning is seen to be the dependent variable and teaching is the independent variable. Instead of "giving 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

Industry’s approach insures that whatever is taught is relevant to the achievement of the desired behavior in the trainee. The teaching materials and techniques are chosen for their relevance to this end and for no other reason. After deciding what we want the trainee 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 trainee 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 new approach, the course writer decides what behavior he wants the trainee to acquire, then decides upon the best way to get the trainee 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 instructors 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. The teacher’s behavior is part of the teaching plan. Training objectives are *statements* which specify learner behavior. 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.

Task Analysis vs. Course Objectives

Before course objectives are written a *task analysis* must be made. A task is a logically related set of actions required for the completion of a job objective. Stated another way, a task is a complete job element. A job includes a number of tasks. EXAMPLE: One of the tasks that must be performed by the auto mechanic is that of changing a tire; all of the steps involved in

Let’s look at how course objectives differ from the task analysis:

Task Analysis	Course Objectives
1. A task analysis describes the job as it is performed by a highly skilled person.	Objectives describe the kind of performance that will be expected at the end of the course.
EXAMPLE: A highly skilled person may be able to perform a particular machine adjustment in five or 10 seconds without using any job aids to remind him or her of the steps. It might be unrealistic to expect a trainee graduate to perform that well on the day of graduation. It might be far more realistic to expect the trainee graduate to be able to perform the task without the use of job aids in 10 or 15 minutes. (If the trainee can perform all of the steps of the job, and if he or she can determine when the job is properly performed, then practice on the job will improve proficiency.)	
2. The task analysis describes all of the steps carried out in the performance of the job.	Objectives of a course do not necessarily include those things that the student already knows.
3. Another difference between task analysis and course objectives is in the subject matter itself. It might be that some of the skills called for in performing an occupation are either unrealistic to teach in the classroom or are better taught on the job.	

An example of this might be paper work expected of a skilled craftsman. This task might be so different from one location to another, and so easy to teach (relatively speaking), that it might be a task better learned on the job.

The key question to ask is this: *What kind of things should the student be able to do at the end of the course that will most facilitate his or her becoming a skilled craftsman in the least amount of time?* In other words, *What should the student be able to do at the end of the course so that all that stands between the student and the skilled performance is practice?*

tire changing go to make up the complete task. Some of the steps taken during task analysis are:

- List all of the tasks you can think of, by looking at a job description.

- Watch the mechanic actually doing the job.

- Talk with the mechanic now working at the job, he or she will tell you what the job is.

- Talk to the supervisor, find out what the job ought to be.

You do not teach all of the tasks listed in a task analysis. Some will be deleted.

The statement of objectives is the key document to performance of all remaining steps of course development. It is the blueprint describing skills and performance we hope to achieve in our trainees. It is a description of the goal we intend to reach. Unless we know precisely where we are going, we might wind up someplace else . . . and never even know it.

Training Objectives

You will have a good start toward understanding objectives when you are able to distinguish between 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).

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, quality and speed of the terminal behavior which the instructor will accept as evidence that the learner has acquired the behavior.

For example, given a list of

statements and the labels "training objectives," "course descriptions" and "instructor's plans," the trainee will be able to correctly label every statement without error.

Terminal Behavior – label statements

Conditions – given a list of statements and the labels "training objectives," "course descriptions," and "instructor's plans"

Minimum Level of Achievement – every; correctly; without error

Course Description

A *course description* is a statement that describes format, procedure and content. It may mention behavior which is expected of the learner, but this behavior of the learner occurs *during* the training, in fact, it is part of the training. A course description fails to specify what the participants in the program will be able to do at the conclusion of the program. For example, the new employee will be covered on and should gain a general knowledge and understanding of company policies, organization, benefits, demands and requirements of the job.

Instructor's Plan

An *instructor's plan* includes statements that specify some things or actions that the instructor will do or take in order to achieve an objective. These statements clearly describe behavior which is to be carried out by the instructor. They are part of the instructor's lesson plan. For example, by direct discussion, have the group develop the importance of checking the windshield wipers and heater-defroster regardless of season.

Characteristics of Objectives

The statement of course objectives consists of as many statements, items or examples as are

necessary to describe the *desired* behavior of the students at the time they leave the course. It must be prepared in enough detail so another instructor could turn out a trainee who could do the kinds of things you want him or her to do at the proficiency levels you desire.

Each objective is specific and deals with a single task or with steps within a task. Some consist of a single sentence, others are made up of two or more sentences. Some begin with a general statement followed by specific statements.

The statements of training objectives will have the following characteristics:

1. An objective says something about the *trainee*. It does not describe the outline, the instructor or the kinds of classroom experience to which the student will be exposed.

2. An objective talks about the *behavior* or *performance* of trainees. It does not describe the performance of the instructor, nor does it describe what the trainee is expected "to know" or "understand."

Though you might begin an objective by a general statement such as, "The trainee will understand defensive driving," (overview) you would go on to explain what you mean by "understanding" by describing what the student will be expected to do to demonstrate your definition of understanding.

In some cases the student may be expected to answer questions, to solve problems, to describe a procedure or to construct a gadget. Whatever it is *you* mean by understanding would be defined in the sentences to follow the general one.

In any case, an objective describes what the trainee will be doing to demonstrate his or her

achievement of your instructional intent.

Do *not* use the following kinds of words in objectives because they describe what the instructor will be doing:

- to give trainee sufficient background . . .
- to explain the need for learning to . . .
- to give trainees a working acquaintance with . . .
- to convince trainees that the effects of . . .
- to explain the advantages and limitations of . . .
- to give trainees a brief introduction to . . .

- to give trainees an understanding of . . .

- to make instructor-trainees really understand training objectives . . .

- I want to show him or her how to use the practice.

3. A training objective describes behavior which the trainee will be capable of at the *end* of a learning experience, rather than the means that will be used to get him or her there. It talks about *terminal* performance rather than course content.

4. There are three elements which *each* training objective must specify:

- Terminal behavior
- Conditions.
- Minimum level of achievement

Terminal Behavior

What the trainee will be able to *do* if the training is successful. "Do" is underlined to emphasize the importance of specifying the terminal behavior in terms of *observable action*.

In stating behavioral objectives, use words which *describe action* and that *can be observed*. In other words, "What is the learner *doing* when he is demonstrating that he has achieved the objective?"

BEHAVIORAL

- | | |
|-----------|-----------------------|
| to write | to identify |
| to recite | to conduct |
| to find | to express |
| to solve | to explain |
| to list | to classify |
| to state | to select |
| to choose | to install |
| to name | to repair |
| to trace | to remove |
| to adjust | to construct |
| to match | to differentiate |
| to splice | to demonstrate |
| to tie | to answer orally |
| to coil | to locate and operate |
| to throw | to answer in writing |
| to solder | to ascent and descend |

1. Behavioral objectives allow for more appropriate evaluation procedures because the meaning of the objectives are clear. Training objectives must be measurable while in the classroom!
2. The instructor will be able to better select learning activities since he or she knows precisely what kind of student behavior he or she is attempting to produce.

NON-BEHAVORIAL

- | | |
|----------------|---------------------------------|
| to know | to have knowledge of |
| to think | to really understand |
| to learn | to be acquainted with |
| to enjoy | to be familiar with |
| to remember | to sympathize with |
| to perceive | to increase his or her interest |
| to understand | to develop an appreciation of |
| to appreciate | to grasp the significance of |
| to recognize | to gain a working knowledge of |
| to be aware of | to develop conceptual thinking |
| to comprehend | |

1. These words describe something that is happening in the learner's head where others can't see it.
2. There is no way to measure these words in units of measurement.
3. These words are broad, vague and ambiguous. They permit a variety of interpretations. (You must define what type of student behavior signifies their understanding.)
4. Do you think most people would agree on the meaning of these objectives? What kind of training program would be planned to achieve it? How could you measure whether or not the objective had been achieved?

NOTE: If you use Non-Behavioral words in your "overview," they *MUST* be further defined in terms of what the learner will be *DOING* when demonstrating "knowledge," "understanding," etc.

Caution: Be very careful how use the word "orally" in a training objective. Keep in mind that you must be able to measure *each* trainee for *each* objective. Without the use of references, the trainee will be able to state orally the four kinds of U.S.O.C.

The above objective is poor because the instructor will stand before the class and ask someone to state orally the four kinds of U.S.O.C. No instructor would ask all eight trainees, one after another, to orally state the four kinds of U.S.O.C. Therefore, if you can't measure all trainees, the objective isn't good.

The objective below uses the word "orally," however, each trainee will be measured.

Each trainee sitting at a No. 14 desk, will correctly locate and orally state the function of the 10 most commonly used keys on the shelf of the test desk. While each individual trainee is performing, the other trainees will be given an assignment.

Conditions

The *conditions* can be defined as the circumstances under which the terminal behavior is expected to occur.

Conditions means whatever help is provided (allowed, given) or denied (restricted) the trainees while they are performing the terminal behavior. (*Conditions* have nothing to do with what you *give* trainees during the lesson.)

Consider what materials will be given or provided for the learners that might assist them in demonstrating that they have acquired the behavior. Consider what restrictions or limitations will be imposed if any. Such restrictions may include:

- given a list of
- using BSP 462-300-200 PT
- without the aid of tools

- with the use of references
- given a standard set of tools
- given a properly functioning
- using a set of suggested rules
- you may use SD's, CD's, and SC's

• without the use of references, notes, charts

• when presented with 10 Multiple Choice questions

• while sitting at a No. 14 testboard and from recall

• using a 35F test set, proper tools and reference material

• when presented with a tape recorder and a blank reel of tape

Conditions should be:

1. As "real" as possible
2. Recreate the situation
3. Write description of actions,

written exams, etc.

Minimum Level of Achievement

(Also referred to as "criterion of acceptable performance" or "stating the criterion for satisfactoriness.") The *quantity*, *quality* and *speed* of the terminal behavior which the instructor will accept as evidence that the learner has acquired the behavior. In other words, how well do we want the trainee to be able to do it?

In specifying "minimum level of achievement" you might specify all three (quantity, quality and speed), if all three are relevant to a single objective. You might just use one (quality), or two (quantity and quality). The important thing is to use as many as are relevant to each single objective.

1. *Quantitative* (number or per cent) is specifying the minimum number of correct answers or responses you will accept or the number of principles which must be applied or identified in a given situation. (All 35, 20 of the 28, less than 100 words, no more than four errors, error free or at least five.)*

*NOTE: If we do not want to insist that each learner perform in

exactly the same way as every other learner, the lower level of acceptable performance is specified, but each learner can surpass that limit by performing differently from every other learner.

An alternative to indicating "number" is to indicate per cent of proportion (85% correct or at least $\frac{3}{4}$).

2. *Qualitative* is defining the quality of acceptable performance in more detail. It is defining the important characteristics or attributes of performance accuracy. For example, using a 35F test set, proper tools and reference material, the trainee will be able to adjust the A and B relays to meet electrical requirements.

Terminal Behavior: adjust the A and B relays

Condition: using a 35F test set, proper tools and reference material

Minimum Level of Achievement: to meet electrical requirements

"To meet electrical requirements" is defining the quality of acceptable performance in more detail. Other examples of defining "quality" are:

- according to the specifications indicated on the attached blueprint
- according to the B.S.P. procedure
- without creating service interruptions
- meet all B.S.P. and C.R.T. requirements

Occasionally we tend to use phrases like the following, but we are unable to decide whether the phrase should be called a "condition" or a "minimum level of achievement - qualitative."

- using the three point methods of climbing
- using all safety rules while performing
- using the format (or rules) spelled out in this class

Ask yourself if the phrase says anything about the excellence of performance which will be expected of the student. If it does, call it a criterion (minimum level of achievement - qualitative).

In defining "Minimum Level of Achievement - qualitative," we tend to want to use words like "accurately," "properly," "successfully," "correctly," etc. If you do use these words, try to define them in more detail:

- problem solutions must be accurate to the nearest whole number

- weigh materials accurately to the nearest milligram

- calculations must be accurate to at least three significant figures

3. *Speed* (Time Limit - seconds, minutes, hours, days): When we do want to insist that the performance of the student must occur within a specified amount of time, it is only fair that we communicate this intended criterion to the learner. If we do not intend to evaluate the learner on the basis of the speed with which he or she performs, we need not indicate a time limit. Examples include:

- answer income repair calls within 10 seconds

- correctly answer 14 or 15 questions within 10 minutes

- solve at least two cases of trouble within a period of 30 minutes

- adjust the A and B relays to meet electrical requirements within two hours

- adjust all 35 mechanical requirements within two days

Two Types

There are two types of minimum level of achievement: *student minimum* (the trainee will be able to solve four of five) and *class minimum* (90 per cent of the class will solve four of five). A student minimum level does not need to

include class minimum level. An objective that has a properly stated class minimum level *must* include a student minimum level. The student minimum levels should be established by the person writing the objective, and, if necessary, they can be revised as an instructor works with them. If an instructor decides that he wants to set a class minimum, he may do so after running about two or three classes.

There are advantages in having both student and class minimum levels in your objective:

- They serve as standards by which an instructor can judge both the trainee and him or herself.

- The student minimum tells you how well a trainee has done; which trainees have or have not achieved the objective.

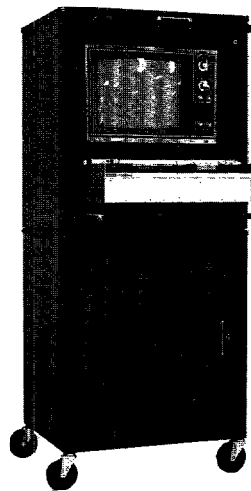
- If a trainee does not meet a student minimum, it might be the fault of the trainee or it might be us. It is well to look at the following items and make improvements in our course if necessary: the adequacy of your teaching; maybe you are not clear, maybe you don't emphasize key points enough, maybe much more learning could have taken place if you had had better training aids, maybe your enthusiasm for teaching the subject has gone downhill, etc.

The advantage of a class minimum level is that the instructor can establish a standard by which he or she can measure his or her own performance in terms of the achievement of the total class. In most instances, the decision about what performance will be considered acceptable is an arbitrary one. This is one place where the experience and wisdom of the instructor is most important, because specification of satisfactory performance is one of the unique contributions that can be made only by the skilled instructor.

Summary

This paper attempts to describe the training methods used in big industry today. Behavioral objectives are new and place more emphasis on communication between the instructor and the student. Industry feels the learner has a right to know exactly what it is he or she should be learning. If the instructor cannot say what the trainees should be able to do at the end of the course, he or she cannot adequately teach them. The creation of numerous job opportunities has increased the need for more instruction and an increase in overall training requirements.

The behavioral objective approach to training places emphasis upon what the trainee learns. It is



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interesting to note that big industry, such as American Telephone & Telegraph Corp., have gone full bore into instructional behavioral objectives. They believe that once an instructor decides on teaching the students something, several kinds of activity are necessary on his or her part to succeed. The instructor must first decide upon the goals he or she intends to reach at the end of the course program. The instructor must then select procedures, content and methods that are relevant to the objectives; cause the student to interact with appropriate subject matter in accordance with principles of learning; and finally,

measure or evaluate the student's performance according to the objectives or goals originally selected.

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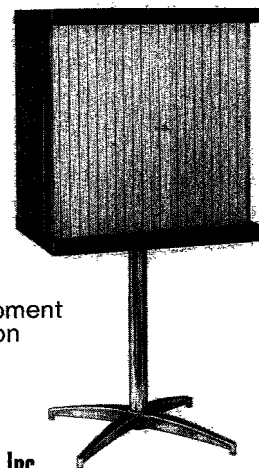
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