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AUTHOR Bassett, Ronald E.; Kibler, Robert J.
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ABSTRACT

The purposes of this study are to develop a valid procedure for teaching students to use behavioral objectives and to determine minimal levels of competence in using objectives. It was hypothesized that when objectives are provided for a unit of instruction, subjects trained to use objectives will score significantly higher on an examination consisting of items matched to the objectives than subjects not trained. The subjects were 159 undergraduate students enrolled in a survey course of human communication theory at Florida State University. The hypothesis was supported by the data, and implications for future research and classroom application are noted. (RB)

EFFECT OF TRAINING IN THE USE OF BEHAVIORAL OBJECTIVES ON STUDENT PERFORMANCE IN A MASTERY LEARNING COURSE IN SPEECH COMMUNICATION

by
Ronald E. Bassett
Assistant Professor, Department of Speech Communication
The University of Texas at Austin

and

Robert J. Kibler
Professor, Department of Communication
The Florida State University

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Supplying explicit statements of instructional objectives to learners is an integral aspect of mastery learning models of instruction (Carroll, 1963; Bloom, 1968; Block, 1971; Spell, Kibler and Parks, 1972). This practice appears to be based on the assumption that objectives will reduce the student's uncertainty about what is required of him, thus permitting the student to maximize learning by selectively attending to the most relevant stimuli in the instructional setting. If this assumption is valid, then it is reasonable to expect that in empirical investigations in which performance is compared between subjects (Ss) given objectives and Ss not given objectives, those possessing objectives should exhibit greater learning. However, as Duchastel and Merrill (1973) demonstrated in their extensive review of objectives' research, this relationship has not been consistently observed. While possession of objectives by learners has been shown to facilitate learning in a number of studies, such a facilitating effect has not been observed across all studies. The generalizability of such an effect is therefore quite difficult to determine at this time. Furthermore, serious methodological problems appear in the literature with such frequency that it is possible to place reasonable confidence in few of the studies.

Although there are many methodological inadequacies in the objectives' literature, the ability of learners to use the objectives given to them emerges as an especially critical question for research. Since behavioral objectives (BOs) are assumed to be a learning tool, it seems reasonable that students may require training before they are able to use objectives with maximum effectiveness. However, most investigators have ignored the question of student ability to use objectives and assumed that when learners are given BOs they will use them, and that they will use them as the investigator intended. Because little information on the need for training students to use objectives is presently available, the validity of the two assumptions is not known. However, if training is necessary, and it is not provided, then positive effects of BOs may not emerge. Because it seems important to determine if training learners to use BOs is necessary, the relationship between training in the use of objectives and learner achievement was investigated in this study.

Several investigators have suggested that students need to know how to use objectives before effects on learning will be present (Tiemann, 1967; Jenkins and Deno, 1969; Boardman, 1970; Brown, 1970; Morse & Tillman, 1972; Tobias & Duchastel, 1972). Only three studies have been found, however, which report procedures for training learners to use objectives. Boardman (1970) and Brown (1970) attempted to train Ss to use BOs, although neither assessed the effectiveness of the training. Furthermore, both concluded from anecdotal evidence that their limited training procedures were probably inadequate. In contrast, Morse and Tillman (1972) empirically tested the effects of their training efforts.

Two levels of training were employed in the Morse and Tillman study. In the first, Ss were directed to read Mager's (1962) Preparing Instructional Objectives. They received 100 minutes of classroom instruction focused on the three objectives presented in the text. Ss in

the second training condition were directed to read Mager's book out of class, with no classroom instruction provided. A third group (control) was directed to perform an unrelated task. All Ss completed a test based on the Mager text to assess the effects of training. Ss who received in-class instruction achieved significantly higher scores on the training test than Ss in either of the other two groups.

In the second part of the study, one half of the Ss were given BOs for an assigned reading and the remaining half were not given objectives. Ss with objectives achieved higher scores on test items matched to those objectives than did Ss not possessing objectives. However, no significant main effect due to training and no significant interaction effect between training and possession of BOs were found. Consequently, Morse and Tillman concluded that training was not necessary for students to use objectives effectively in learning.

The factor which most seriously limits the confidence which may be placed in this conclusion concerns the validity of the training procedures. Morse and Tillman acknowledge that Mager's book provides information about objectives, but does not contain instruction in how to use objectives in learning. Hence, the validity of the training is questionable. Moreover, the validity of the training test as a measure of ability to use BOs in learning is equally questionable. Conclusions about the effects of training cannot be drawn without establishing a strong correspondence between the training and the required terminal behavior.

If the effect of training in the use of objectives on the achievement of students possessing objectives is to be determined, then a valid procedure for teaching students to use objectives must be developed and employed. In addition, all students who receive training must be required to demonstrate a minimal level of competence in using objectives. If it is necessary for learners to know how to use BOs to maximize the effects of objectives on learning, and if the above two conditions are satisfied, then this hypothesis appears reasonable:

> When objectives are provided for a unit of instruction, Ss trained to use objectives will score significantly higher than Ss not so trained on an examination consisting of items matched to the objectives.

Method

Subjects

Subjects (N=159) were undergraduate students enrolled in a survey course of human communication theory at Florida State University. Ss varied extensively in the fields selected for their major(s) and minor(s).

They were not informed that a study was being conducted.

Training

During a previous term students enrolled in the course who achieved at least the grade of 'C' completed a questionnaire which asked them to identify the steps they went through in using objectives to study for course examinations. From these self-reports, five steps in using objectives were identified:

1. Read the objective to identify where important material may be found.
2. Read the material to locate specific passages related to the objective.
3. Read the objective to determine the form of the test item.
4. Read the objective to determine what you must be able to do to answer the test item correctly.
5. Ask yourself a question in a form similar to the one you will be asked on the test and try to answer it.

A 60 frame, branching type, instructional program was developed to teach Ss how to perform the behaviors required by each of the steps. Six behavioral objectives were specified for the program. The program underwent three separate revisions on the basis of responses obtained in a pilot study.

The validity of the training is supported because the behaviors which the program was designed to teach were derived from strategies successful students reported employing in using objectives to learn.

Training Tests

Four separate test forms were developed to measure Ss' ability to perform the behaviors specified by the six objectives for the programmed instruction. The first form contained 20 items and the remaining three forms each consisted of 12 items. The minimum criterion level for acceptable performance was set at 90% correct answers for each of the test forms.

Validity. The validity of the training tests was assessed by having six trained judges rate on a three-point scale the extent to which each of 21 items randomly selected from the four test forms corresponded to the objectives to which they were matched. The inter-rater reliability of these ratings obtained by Ebel's (1951) analysis of variance procedure was .98. The ratings indicated a great degree of correspondence between the objectives and items.

Reliability. Since performance on the training tests was evaluated by a fixed criterion (i.e., 90% correct answers on at least one of the four forms was required for "passing"), the tests were criterion-referenced. Reliability estimates obtained by Livingston's (1972) criterion-referenced procedure for the four forms were .92, .66, .77 and .17.

Course Examination

The dependent measure in the investigation was the number of correct answers obtained by Ss on a 28 item multiple choice (five alternative) test. The test consisted of two items for each of 14 objectives constructed for Kenneth Gergen's (1971) Concept of Self. Objectives were written in the format of this sample:

> Given five alternative statements, the student will select the statement which most accurately illustrates or describes the concept of double bind (Chapter III).

The following test item was written to match the objective:

> Select the alternative which best illustrates the concept of double bind:
>
> A. Martha and Milton decide they want to eat dinner out Friday night. She wants Greek food and he wants Hungarian food. They cannot agree on where to go.
> B. Armando's doctor tells him he has an ingrown nail that must be corrected now. Armando decides to wait until he can afford the expense.
> C. After having her color television repaired, Debbie pays the serviceman but is not satisfied with the way the machine works.
> D. Gina needs nine hours to graduate. She cannot decide whether to take one five and one four hour course, or three, three hour courses.
> E. Harold's wife Louise tells him often that she loves him, but frequently ruins his favorite meals by overcooking them.

Validity. Six trained judges examined the test items and agreed unanimously that each item satisfied the specifications of the objective to which it was matched.

Reliability. The reliability of the scores obtained on the test was determined to be .86 using the norm-referenced Kuder-Richardson procedure, and .92 using Livingston's (1972) criterion-referenced procedure.

Procedure

To clarify the description of the administration of the experimental treatments, the events which took place during each of the first four class sessions are discussed in the temporal sequence in which they occurred.

First class session. Ss were randomly assigned to either the training or no-training treatments. Within each treatment condition, each S was randomly assigned to one of three instructional sections. Each section was supervised by two instructional assistants (IAs). Three graduate students and nine undergraduates served as IAs. Each of the undergraduates had completed the course in the previous term with the grade of 'A'. IAs were randomly assigned to the six instructional sections.

Second class session. All Ss reported to their assigned sections. Ss in the sections designated to receive training were informed of this requirement by the IAs who also discussed general classroom procedures. The IAs then distributed Form I of the training test. Ss were told that if they answered 90% of the questions correctly, they would not have to work through the programmed instruction nor take any additional forms of the training test. The Ss used machine scorable IBM answer sheets to record their answers. Upon completing the test, Ss returned their test copies and answer sheets to their IAs. Ss were told that attendance was required at the next class meeting, at which time they would be informed of their performance on the test.

Following class, the answer sheets were scored. On the 76 Ss completing the test, only three achieved the 90% criterion.

IAs in the three sections which did not receive training told Ss about general classroom procedures and announced that attendance for the next class session was required.

Third class session. Ss in the training sections were informed of their performance on Form I of the training test. Ss who achieved the 90% criterion score were excused from class. Ss not reaching criterion were given the programmed instruction, directed to work through it and to then request Form II of the training test.

When a S completed Form II of the training test, he returned the test copy and his answer sheet to his IAs. IAs immediately scored the answer sheet with a punched answer key and completed a feedback sheet which they gave to the S. The feedback sheet informed the S of the percentage of correct answers which he had obtained. If his performance was less than the 90% criterion level, the feedback sheet identified the BOs for the program which corresponded to the test items answered incorrectly. The feedback sheet also identified frames in the program which contained

information relevant to the unmastered objectives. The IAs then returned the S's copy of the program and encouraged him to restudy it. This set of procedures was repeated for Ss who failed to achieve the criterion level for the third form of the training test. Only six Ss failed to achieve criterion on the third form, but each of these was able to achieve the 90% level on the fourth form.

Ss in the no-training condition reported to their assigned classrooms and received the following placebo treatment: They were informed by their IAs that a graduate student in communication needed their assistance in conducting research. Each S was given a booklet which contained directions for completing semantic differential scales related to the nonverbal behavior of teachers in classroom settings. The task required approximately 45 minutes to complete. Ss were informed that by completing the task they satisifed the course requirement that they participate in an experiment.

Before leaving class, Ss in all sections were given copies of the BOs and required readings for the first unit. Ss not given training were told they could take the test for the first unit at the next class session, if they wished to do so. Ss receiving training were informed that they could take the examination for the first unit only after they had achieved criterion on the training test.

Fourth class session. IAs for all sections were present in their assigned classrooms to answer questions regarding the readings and objectives for the unit.

Ss were permitted to attempt the examination. Testing was self-paced, i.e., a S took the test when he felt sufficiently prepared. To attempt the examination, a S requested a test copy and answer sheet from his IAs. The IAs scored the answer sheet as soon as the test was completed. When scores were available for all Ss on the examination, the data were analyzed.

Results

A directional t test for independent data was computed for the number of correct answers achieved by the two groups on the course examination. The t test analysis produced a significant t value ($t = 2.37$; $df = 157$; $p < .01$), indicating that the trained Ss had higher scores, and thus supporting the hypothesis. Table 1 summarizes the results of the analysis.

TABLE 1

SUMMARY OF ANALYSIS

Descriptive data	Treatment	
	Training	No-Training
Mean	24.29	22.78
Standard deviation	3.33	4.51
Cell size	76	83

Discussion

There are at least two reasons why the training treatment would be expected to produce immediate positive effects on learner achievement. First, there was a relatively short time between when Ss completed the training and when they attempted the first test for the course. Therefore, Ss had an immediate opportunity to apply the strategies they had learned for using BOs. Second, before completing the course examination, the untrained Ss did not have firsthand knowledge of the relationship between the course BOs and testing procedures. In contrast, the trained Ss were given extensive practice in using BOs and answering test items as part of the training treatment. It should be noted, however, that the programmed instruction did not provide practice for Ss in answering test items over the material contained in Gergen's Concept of Self.

Implications for future research. Since training Ss to use BOs produced an immediate positive effect on test performance, future investigations concerning the effects of learner possession of objectives should account for learner competence in their use. Specifically, empirical assessments of learners' ability to use BOs should be obtained. If it is indicated that learners lack the basic ability to use objectives effectively in learning, then training should be provided.

Implications for classroom application. In terms of student achievement, the benefits derived from training learners to use BOs in an applied classroom setting may not be worth the costs. Although differences in achievement between trained and untrained learners were statistically significant, training effects would probably disappear with the transformation of scores into letter grades.

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