Sokoto Educational Review, Vol. 1, March 1986

A Study of the Effects of Specific Instructional Objectives on the Acquisition of Intended and Unintended Learning Content

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ABSTRACT

This study sought to determine the effect of specific objectives on the acquisition of intended and unintended learning content. It has hypothesized that the experimental and control groups would not differ in their acquisition of intended and unintended learning. The subjects were 82 undergraduates randomly assigned to the experimental (E) and Control (C) groups.

The *post-test only control group design* was employed whereby the E group had specific objectives inserted in their typed lecture. The C group received the same lecture without any objectives. After 2 hours study of the lecture material, a teacher-made post-test, the items of which were partly referenced to the specific objectives, was administered to the two groups. Using ANOVA to analyse the post-test data, the E groups performed significantly better in the test items referenced to the objectives. But the control excelled in the items not referenced to the objectives. The implications of the study are highlighted.

INTRODUCTION

Instructional objectives, sometimes called educational objectives (Levin and Long, 1981: 27) or instructional goals (Dick and Carey 1978:14) describe and illustrate the behaviours and processes that students are expected to acquire. They are statements that describe what it is that students will be able to do after they have completed instruction. The objectives should describe the major culminating of synthesizing behaviour which results from studying the unit or content. According to Typer (1949), the most useful and clear way of stating objective is to indicate the content to be taught and learned and the kind of behaviours to be developed. For example, the ability to remember the capital cities of the nineteen states of Nigeria is a specific educational or instructional objective that includes two dimensions: content (names of state capitals) and behaviour (remembering). But other elements may be included. For example, according to Steiner (1972), instructional or performance objectives state what the student will do, under what conditions, to what level of mastery, and using what time limit (if any). A number of dimensions to the question of objectives have been explored by researchers.

Related Literature

The main research emphases have been on such areas as the effect of behavioural and non-behavioural objectives on achievement in a number of subject area; congruence between instructor-provided and student-perceived behavioural objectives in a college course of instruction; and the effect of presentation of behavioural objectives in programmed instruction on incidental learning. Robert (1972) in his study of the effect of behavioural objectives on class performance and retention in physical science concluded that prior knowledge of learning objectives promotes learning and causes resistance to forgetting in physical science. In a related study by Mkpa (1981) which examined the effects of students' prior knowledge of instructional objectives on the learning and retention of African history content, the data obtained when analysed showed that the overall mean scores of the experimental groups receiving statements of objectives were significantly higher than those of the control groups not receiving the objectives in both the achievement and retention tests that followed the experimental treatment. The findings demonstrate that when learners are aware of the objectives of lessons prior to instruction, the materials learned are not easily forgotten. This conclusion was also reached with regard to the high and medium ability subgroups within the experimental group.

In his own study, Weinberg (1970) examined the effects of presenting varying specificity of course objectives to students on learning motor skills and associated cognitive material. No significant differences were found between the experimental and control groups. Preference for receiving objectives, a desire to receive objectives in all classes, and a positive attitude toward the guidance function of objectives were however, indicated by students' responses to a checklist designed to determine their attitude concerning the value of receiving objectives.

Adams (1974) studied the congruence between instructor-provided and student-perceived behavioural objectives in a college course of instruction. In answer to three questions that guided the study, he found that student awareness of behavioural objectives reinforced with experience, moves the student closer towards agreement with the instructor's value system for objectives and is a factor related to examination performance. A general conclusion was drawn that when students are first introduced to behavioural objectives, understanding of what is learned has a larger role to play in learning than academic ability.

Support for the use of behavioural objectives was concluded from Miles' study (1976) which investigated the effect of presenting behavioural objectives in programmed instruction on incidential learning. An attitude scale administered to assess student preferences revealed almost unanimously a

preference for the use of objectives. But given the choice of behavioural or outline objectives, a majority of subjects favoured the use of the outline form.

Although many of the studies reviewed above tend to agree that better learning results when students are made aware of the behavioural objectives of the content they are about to learn, more investigation needs to be carried out in the area of intentional and unintentional learning in the typical classroom setting. The study related to incidental learning by Miles was done with programmed instruction which is not widely used in our schools. As a result, the finding of that study is not generalizable to the traditional form of learning that is typical of the Nigerian classroom. There is need, therefore to examine the effect of instructional objectives in our environment.

Problem Formulation

Although many educators and researchers tend to stress the value of utilizing instructional objectives in the promotion of active learning, one major criticism of the instructional objectives is the possibility of restricting the effective learning of unintended materials. These unintended outcomes may really be very important learning outcomes which are also inherent in any learning situation. This criticism was highlighted by Atkin (1969).

According to him, an instructional objective may, for example, expect a learner to learn the behaviour of a meal worm by blowing air against it through a straw. While the learner is performing this task, he is learning a number of other vitals things which are not specified as objectives. These may include interaction with objects, humane treatment of animals, the structural characteristics of the larval form of certain insects, equilibrium, possible uses of plastic straws, etc. When, therefore, emphasis is laid on the use of specific instructional objectives, the rest of the possible outcomes are neglected.

To what extent is the above assertion true? While the argument appears true and intensely convincing, there is need to demonstrate its validity more empirically than the theoretical thought expressed by Atkin. The proof or vertification of Atkin's hypothesis was the major problem of this study.

Data Collection

With the random assignment of subjects to the two groups, the data that were considered necessary for the study were the mean scores of the experimental and control groups on the post-test that followed the experimental treat-

ment. This consisted of a 25 item short-answer achievement test some of which were structured to reflect the instructional objectives of the passages used for the study (The nature and characteristics of traditional education in preliterate African societies). The test items were constructed such that students were expected to fill in the spaces provided with correct responses based on their understanding of the passage.

The content validity of the test was quite high because the items were constructed to directly relate to the passage studied as well as to some of the instructional objectives of the lesson. Using the equivalent form of the test (multiple choice), the reliability of the test was calculated and it yielded the coefficient of equivalence of 0.84. This was considered sufficiently high for the study.

Experimental and Statistical Design

The experimental design used for the study was the *post-test only control group design.* The subjects were randomly assigned to two treatment groups — the experimental and control. The experimental group received the experimental treatment, i.e. exposure to the lesson objectives, while the control did not receive the treatment. At the end of the treatment, an achievement post-test was administered to the experimental and control groups to determine the effect of the independent (specific instructional objectives) on the dependent variables (mean scores on the achievement test related to intended and unintended learning). The above summarizes the nature of the study.

The post-test only control group design does not call for pretesting the groups, which conditions surrounding this study did not make possible. This design is quite high is internal validity. The random assignment of subjects to the experimental (E) and control (C) groups was designed to rule our selection bias. With this random assignment, any effects of extraneous factors would be equally spread over the groups at the beginning of the experiment. Even if such effects could not be eliminated, once they do not interact with the experimental treatment, they do not threaten the internal validity.

One possible threat to the internal validity of this design, according to research literature is "differential mortality". This, according to Wiersma (1976:102) means that the dropouts in one group may have different characteristics from those in another group and these characteristics may be relevant to the experimental and dependent variables. In order to check this, it was ensured that all who started the experiment ended it. This was quite easy to achieve since the experiment did not last longer than a few hours.

The post-test was taken by the E and C groups directly after the experimental treatment. This was so organized because any substantial time lapse between the treatment and the post-test might adversely influence the dependent variable

as a result of maturation.

The study was conducted as follows: A lecture of about 1,500 words, titled 'The nature and characteristics of traditional education in preliterate African societies'' was typed out on foolscap paper for the experiment. The same lecture was distributed to the E and C groups at the same time with each group sitting in a different classroom. The treatment received by the E group was the insertion of 10 specific instructional objectives at the beginning of their own reading material. The material given to the control group contained no objectives at all. Both groups were given two hours to read through the material and be prepared to answer the questions that were to follow, i.e. the achievement test. The invigilators in the two classrooms gave extra time of about 30 minutes to the two groups to ensure that all the members of both groups were sufficiently ready for the test that was to be administered. Thus, the achievement test was administered as soon as each group was prepared for it. Before the test was administered, the reading materials were removed from the groups.

The following were the objectives inserted in the reading material of the E group.

''On completion of the reading material, you should be able to do the following:-

(1) Define the term ''preliterate education''.
(2) State any three differences between traditional education and formal education.
(3) Outline at least 3 tenets of traditional education.
(4) Identify any two vital roles of parents in the education of the child.
(5) Point out the role of the adult community in the education of the child.
(6) Identify the subjects taught in the education.
(7) Outline at least 3 ways whereby historical facts were transmitted from one generation to another.
(8) List two measures whereby children were disciplined in the society.
(9) Explain the meaning of apprenticeship system.
(10) Point out the processes of evaluating learning.

The 25 item short-answer test was structured in such a way that 15 of the items were referenced to the 10 objectives specified for the E group in their reading material. The other ten items related to other areas of the reading material that were not specified in instructional objectives. The essence of this arrangement of test items was to observe how the E group would respond to the items that were referenced to the objectives. If the E group performed well only in the items referenced to the objectives and poorly in the areas not referenced to the objectives, then conclusion would be that the insertion objectives suppressed unintended learning and enhanced intended learning. The hypotheses were upheld or rejected at 0.05 level of significance.

Findings

Table 1 summarizes the findings of the study after the test papers were marked.

Table 1

Mean Scores and Standard Deviation* of the Experimental and Control Groups in the Intended and Unintended Learning in the Achievement Test.

Group	N	Intended	Unintended
Experimental	41	75.27	64.97
		(5.31)	(6.07)
Control	41	71.83	73.32
		(6.17)	(6.33)

* Standard Deviation Scores in Parentheses.

The data presented in Table 1 were analyzed for significance to test the hypotheses using the analysis of variance. Table 2 presents the summary of the analysis of variance of the mean scores on the intended learning for the E and C groups.

Table 2

ANOVA of Mean Scores on the Intended Learning for the Experimental and Control Groups

SOURCE	SS	DF	MS	F
Between	31.50	1	31.50	4.24
Within	494.40	80	7.43	
Total	525.90	81		

F is significant at 0.05 but not at 0.01

The calculated value of 4.24 is greater than the table value of 3.96 required for significance at 0.05 level but less than 6.96 required for significance at 0.01 level. Thus we reject the the null hypothesis 1 at 0.05 (and fail to reject it at 0.01

level), and so conclude that the experimental group performed significantly better than the control in the acquisition of intended learning. Table 3 presents the summary of the analysis of variance of the mean scores on the unintended learning for the two groups.

Table 3
ANOVA of Mean Scores on the Unintended Learning for the Experimental and Control Groups.

SOURCE	SS	DF	MS	F
Between	104.79	1	104.79	12.58
Within	666.4	80	8.33	
Total	771.19	81		

F is significant beyond 0.01.

The calculated F value of 12.58 is greater than the table values of 3.96 and 6.96 required for significance at 0.05 and 0.01 levels respectively. Thus we reject the null hypothesis of no significant difference between the E and C groups in relation to the unintended learning. Thus we concluded that the control group that received no objectives performed significantly better than the E group that received the statements in the acquisition of unintended learning content.

Discussion

The findings of the study reveal that the E group that received statements of specific objectives in their reading materials performed significantly better than the C group that worked with no statements of objectives in the test that were referenced to the statements of objectives. Thus the presentation of instructional objectives in the learners' reading materials facilitated the acquisition of intended learning content. On the other hand the C group performed significantly better than the E group in the acquisition of unintended learning content, that is, the subject matter that were not referenced to the objectives.

The study supports the hypothesis that knowledge of *very* specific objectives facilitates learning by focusing learners' effort and attention on the relevant material and simultaneously detracts attention from incidential material. The presence of specific objectives identified for the E group directed what things to focus attention on. Having learned those intended content sufficiently, the sub-

jects were unable to learn the unintended content equally well.

The C group on their part, since they were not restricted to any specific areas of the reading materials through the use of objectives, they had to thoroughly read through all the content so as to be able to answer any questions from any part of the material. This explains why the C group performed significantly better than the E group in the unintended content that was not referenced to any objective.

The findings of this study are extremely important to the teacher who is bound to work with instructional objectives. It calls for a very thoughtful decision on the mode of utilizing objectives most effectively. Since very specific objectives are known to lead learners to a selective absorbtion of intended learning materials, it suggests that objectives that are too specific are not as useful in facilitating comprehensive learning as objectives that are not so specific and restricting. Thus, useful instructional objectives should therefore not be too specific nor should they be so broad as not to point to any definable behaviour.

As an example, consider the following statements of objectives:

(1) "Students should be able to state any three differences between traditional and formal education" and

(2) "Students should be able to compare and contrast traditional and formal education using specific criteria."

You would agree that whereas both statements are specific objectives (each utilizes a measurable action verb — "state" or "compare and contrast",) calling for a similar behaviour on the part of learners, yet the former statement is *too* specific. The latter is more likely to lead to a more meaningful learning if used by learners. However, a general principle to bear in mind while stating and using objectives is that the scope of the intended learning should be reflected in the nature of objectives written. This means that any learning whether it be facts, principles, skills, competencies, or attitudes that are considered worthy of being learned must be reflected in the objectives of the lesson. Furthermore, and in doing this, the statements of objectives must reflect the breadth and depth of the desired learning. Breadth in this context implies the coverage of subject matter while depth has to do with the mental or intellectual powers, skills, and attitudes to be cultivated.

Generally, however, the acquisition of basic ideas, principles and concepts is a more useful learning than the emphasis on specific facts. This is so because basic ideas and principles such as ideas about causal relationships between human culture and natural environment, or scientific laws and mathematical principles give control over a wider range of subject matter, organize the releationships between facts, and thereby provide the context for insight and understanding. In contrast to the above, the mastery of specific and descriptive ideas at a low level of abstraction is of a more limited utility. This kind of

knowledge hardly produces new ideas nor does it lure the mind onward. Such knowledge is besides, highly obsolescent. Therefore its learning ought not be the major focus of learning or an end in itself. It should be acknowledged, however, that specific facts are very useful in facilitating the higher mental processes. Specific facts constitute the ingredients or raw materials from which to derive generalizations. Their learning should not be a sole end of any instruction.

The above fact should be reflected in the teachers' use of instructional objectives. Those objectives that focus on the acquisition of basic ideas, principles and concepts are more useful than those that limit learners to the acquisition of very specific facts and processes. The former should be the main emphasis of our teachers. In this study, therefore, the author conclude that very specific objectives facilitate the acquisition of those intended contents that are referenced to the objectives and have a negative effect on the acquisition of unintended learning content. For a more comprehensive acquisition of learning content, therefore, teachers instructional objectives should not be too specific. The objectives should compromise between excessive specificity and extreme breadth.

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