

10.8 hours per invitation. Tele-lectures averaged one hour. Station to station telephone rates were low (\$332.00) and represented 13% of what total expenses would have been (\$2,472.90). The last two tele-lectures (1972) illustrate that telephone expenses now represent 8.5% of total estimated expenses. During the evolution of this teaching method, it has been interesting to observe how difficult it can be to obtain hourly station to station estimates. Also, at the time of billing, this hourly rate seems so unduly high for a telephone conversation that the institution may not be charged.

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TABLE 1. ESTIMATED COMPARISON OF 15 ON-SITE VISITS WITH TELE-LECTURES (1965-72)

Year	Location		Travel Time (Hr.) ^a	Air Travel ^b	Auto or Limousine Service ^c	Estimated Total Expenses ^d	Station to Station Telephone ^e
	Institution	Airport					
1965	Univ. of California, Berkeley, Cal.	San Francisco	12-1/2	\$234.90	\$5.00	\$ 253.90	\$ 32.70
1965	Univ. of California, Davis, Cal.	Sacramento	12-1/2	246.00	5.00	265.00	30.95
1965	Univ. of California, Davis, Cal.	Sacramento	12-1/2	246.00	5.00	265.00	33.05
1965	Univ. of Texas, Austin, Texas	Austin	15	137.00	5.00	156.00	24.35
1965	Yale University, New Haven, Conn.	New York	13-1/3	136.60	5.00	155.60	26.85
1965	Smithsonian Institute, Wash., D.C.	Wash., D.C.	8	106.00	5.00	125.00	23.38
1965	Oak Ridge National Laboratory, Tenn.	Knoxville	12	71.80	7.00 ^c	92.80	17.15
1965	North Carolina State Univ., Raleigh, N.C.	Raleigh	12	122.50	5.00	141.50	22.95
1965	Univ. of Wisconsin, Madison, Wis.	Madison	8	44.50	5.00	63.50	15.92
1965	Michigan State Univ., East Lansing, Mich.	Lansing	8	56.90	5.00	75.90	22.30 ^e
1965	Ball State University, Muncie, Ind.	Muncie	5	22.00	5.00	41.00	8.40 ^e
1965	Antioch College, Yellow Springs, Ohio	Dayton	7-1/3	39.70	5.00 ^c	58.70	10.00 ^e
1968	Washington State Univ., Pullman, Wash.	Pullman	14	290.00	5.00	315.00	24.50
1972	Oregon State Univ., Corvallis, Ore.	Corvallis	14	326.00	5.00	351.00	24.50
1972	Michigan State Univ., East Lansing	Lansing	8	88.00	5.00	113.00	15.20
TOTAL						\$2472.90 ^d	\$332.00

^a Air, terminal and automobile time. Berkeley example: 8½ (air) + 2 (terminal) + 2 (car) = 12½ hr.

^b Round trip, tourist rate to Purdue Airport.

^c Minimum of two trips to and from airport. At Oak Ridge a 70 mile round trip by auto is involved and Antioch College a 50 mile round trip by ground travel must be considered.

^d Air travel and auto expenses excluding travel time and honorarium to cover services rendered, slide preparation, postage, etc.

^e Lectures were one hour with three exceptions. One laboratory exercise with Michigan State University took 93 minutes and two sessions utilized 45 minutes to narrate silent films at Ball State University and Antioch College on two occasions.

MEETING THE NEEDS OF STUDENTS WITH IMPROVED BEHAVIORAL OBJECTIVES*

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It would be difficult to find a college course without some kind of objectives for these are basic to organizing learning experiences. The problem is the kind of objectives being used; too many times they are directed toward the learning process. Objectives which begin with such phrases as, "to demonstrate to students . . ." or "to increase the students' abilities . . .," place the emphasis on the process of learning. A much more desirable objective is the one directed toward learning outcomes. This type of approach places the emphasis on the student and the goal he endeavors to attain.

An objective stated as a learning outcome may be reached through many learning experiences. Learning experiences based on objectives written as learning outcomes, are means to ends rather than ends themselves: objectives are tools used in the learning process to bring about the desired learning outcomes. Learning outcomes when considered as end products of instruction include knowledge, understanding, thinking skills, performance skills, communication skills, computational skills, social skills, interests, attitudes, or appreciations.

When stated as learning outcomes, objectives provide:

1. a guide for the instructor and a means of conveying his instructional intent to others
2. a guide for selecting subject matter, the teaching methods, and the materials to be used during instruction
3. a guide for constructing tests and other instruments for evaluating student achievement
4. a guide to the students for organizing their learning activities

It is evident that these four statements represent the proper function of objectives in any course.

Much has been written in the past 10 years in journals including the *NACTA Journal* about the use of behavioral objectives, with emphasis on what is commonly called the "Mager approach." (Mager, 1962). This approach to writing behavioral objectives requires that each objective identify a terminal behavior, define the behavior by describing the important conditions under which the behavior will be expected to occur, and specify the criteria of acceptable performance by describing how well the learner must perform to be considered acceptable. For example, the following might begin a list of behavioral objectives for a course to assist teachers in developing an ag machinery service program:

1. Defines ag machinery terminology.
2. Identifies the meaning of ag machinery terms when used in context.
3. Identifies ag machinery terms that are similar in meaning.

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Behavioral objectives written by the "Mager approach" are valuable tools for training students in basic knowledge and skills. As indicated in Figure 1, Taxonomy of Educational Objectives (Bloom, 1956), behavioral objectives written in this way would tend to be at the lowest level of the cognitive domain. Nearly all college courses are concerned with the higher levels in the cognitive domain rather than at the level of rote recall.

FIGURE 1

TAXONOMY OF EDUCATIONAL OBJECTIVES
COGNITIVE DOMAIN

- 1.00 Knowledge
(defines, describes, lists, names, states)
- 2.00 Comprehension
(converts, explains, infers, paraphrases, understands)
- 3.00 Application
(applies, solves, predicts, relates, uses)
- 4.00 Analysis
(analyzes, diagrams, differentiates, outlines, separates)
- 5.00 Synthesis
(categorizes, compiles, integrates, plans, revises)
- 6.00 Evaluation
(appraises, concludes, discriminates, justifies, interprets)

Many have criticized the use of behavioral objectives. Much of the criticism concerns the laborious and time-consuming task of writing countless numbers of behavioral objectives in an attempt to approach the higher levels in the cognitive domain.

To move to the higher levels within the cognitive domain, a method of writing objectives must be used which places emphasis at these levels. Norman Gronlund developed an alternative to the "Mager approach." (Gronlund, 1970). This method begins with an over-all goal statement for the course or for a unit within a course. The goal statement is oriented toward the future ability of the student in the present course, in a future course, or in the real world. General instructional objectives are then derived from the goal statement. These instructional objectives are at the higher levels of ability and are clarified by listing samples of specific behaviors for each objective. The samples of specific behavior represent accepted evidences of the attainment of the general instructional objective. An example of a goal statement and two general instructional objectives with samples of specific behaviors would be as follows:

Goal Statement: Each teacher will develop an ag machinery service program to serve the needs of his students and community.

General Instructional Objectives:

1. Understands the meaning of ag machinery terminology.
 - 1.1 Defines ag machinery terminology
 - 1.2 Identifies the meaning of ag machinery terms when used in context.
 - 1.3 Identifies ag machinery terms that are similar in meaning.
2. Applies economic and census data
 - 2.1 Categorizes the types of farming in the community
 - 2.2 Describes the growth trends of agriculture in the community
 - 2.3 Identifies present needs for new employees in present ag machinery dealerships in the community

The general instructional objectives are goals to work toward rather than specific types of behavior to be learned one by one. Thus, instructional objectives provide direction for instruction without restricting the teacher or reducing the instruction to the training level. This method requires that teaching be directed toward the general instructional objectives rather than toward each specific behavior representing the general instructional objective. Pre-occupation with teaching an extended list of specific behaviors often times results in the loss of the overall goal of the unit or course. Students must be able to see their destination in a

course as well as how they are going to get there. For proper learning to take place, the students and the teacher must keep the goal in mind and not just a conglomeration of specific objectives.

As stated previously, one of the functions of objectives is to serve as a guide for constructing tests and other instruments for evaluating student achievement. A test of the achievement of students is a test of the extent to which the students have attained the general instructional objectives.

Learning outcomes determined by the general instructional objectives will vary in level. Certain of the learning outcomes may be low-level ones while others may be at such a high level that the students may not be capable of reaching these in the course. The low-level outcomes are minimum essentials, achievable by students, and required for further learning in the area. The high level outcomes are at the developmental level. Included at this level are such abilities as to understand, to apply, to interpret, and to think critically, all requiring extended periods of development. Since there are usually two levels of outcomes it is logical that testing should be at two levels.

Outcomes at the minimum-essential level are usually standards of performance. As such, they are specific, independent, and easily defined. An indication that the student can recall the facts related to the objective constitutes the test for minimum essential outcomes.

It is nearly impossible to test for all the specific behaviors that make up learning outcomes at the developmental level. This is the reason for stating only examples of specific behaviors for each general instructional objective. Students are expected to use what was learned in class to solve new but related problems on the exams and not just recall the solutions to problems discussed in class: thus, exhibiting mastery of learning outcomes such as understanding, application, and interpretation.

The ultimate aim of every teacher should be for all students to master the learning outcomes expressed by the instructional objectives and achieve the goals set forth for the course. The degree of mastery and achievement by students becomes one very appropriate measure of "good teaching."

Summary

Objectives are essential for organizing learning experiences. General instructional objectives should be directed toward learning outcomes, thus placing the emphasis on the student and the goal he endeavors to attain. When stated as learning outcomes, general instructional objectives provide a guide for the instructor, a guide for selecting teaching methods and materials, a guide for constructing tests, and a guide for the learning activities of students. The proper use of objectives enables the teacher to teach and the students to learn and develop abilities necessary to cope with the rapid transitions taking place in all segments of the real world.

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SIMULATION GAMES IN TEACHING AGRICULTURAL MARKETING: A CHALLENGE AND AN APPRAISAL¹

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Computer simulation games have become an integral part of collegiate teaching in business and economics courses for both graduate and undergraduate students. In

addition, many corporations have made extensive use of this technique in their executive training and development programs. Use of business games in colleges of

agriculture has been limited primarily to teaching management principles at both the resident and the adult education levels. The potential for these games, however, as