

## ASSESSING OUTCOMES OF INSTRUCTION IN VOCATIONAL AGRICULTURE

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"I know that you believe you're understanding what you think I said, but I am not sure you realize that what you heard is not what I meant." How many times have we heard this statement and never really thought about its true meaning? Does this type of miscommunication happen with students and teachers?

In this article I shall present some findings from a statewide study in Ohio that was designed to assess the extent to which students completing two years of Vocational Agriculture in grades 9 and 10 know and understand some of the basic principles of agriculture.

### Assessing Objectives

Traditionally, educators have evaluated programs on the basis of input (teaching methods, facilities, qualifications of teachers, etc.) rather than output (students' level of knowledge, performance capabilities, etc.). Due to increased public pressures, educators are beginning to recognize the need for assessing programs in terms of the extent to which students have learned instead of describing procedures on how the learning is achieved.

Since the process of measuring outcomes is a different approach to evaluation than we have encountered and experienced in the past, we must develop new methods to assess progress toward or attainment of established goals. To accomplish this task, criterion-referenced measures rather than norm-referenced measures are used. A norm-referenced measure is one which ascertains an individual's performance in relationship to the performance of other individuals on the same measuring device. With norm-referenced tests, students performance is based upon what the student can do, not how he stands when compared to others.

Using different measures for evaluation necessitates the reporting of results in a different manner. Throughout this article, the term "degree of mastery" will be used. A student's degree or level of mastery is defined as the percentage of assessment items the student can respond to correctly. I have not attempted to define what is the desired or acceptable level of mastery in this article; however, that is an issue that must be dealt with if the results of evaluation are to lead to improvements in instructional programs.

## The Study

Two purposes of the study were to 1) describe the degree of mastery of tenth-grade students who have completed two years of agricultural instruction and 2) to compare the actual degree of mastery of students with the anticipated or expected degree of mastery as perceived by teachers.

Data were collected from 381 tenth-grade students completing two years of agriculture. A random sample of 31 schools was selected from the 125 local schools in 19 joint vocational school districts in Ohio providing agricultural instruction in area vocational centers during the 1972-73 school year. Students completed a criterion-referenced test on the principles of agriculture and the teachers in the 31 schools completed a form in which they estimated the students degree of mastery for 65 items on the test. The assessment instrument was comprised of 102 items designed to assess knowledge and understanding of and the ability to apply some of the basic principles in the areas of leadership, agricultural occupations, animal science, crop and soil science, and agricultural mechanics.

### Level of Mastery

The percentage of students completing two years of instruction who could correctly respond to 76 percent or more of the items was highest for agricultural occupations, followed, in rank order, by agricultural mechanics, animal science, crop and soil science, and leadership (Table 1). Caution should be observed when comparing the proportions of students performing at each level of mastery, since there is no assurance that items in each instructional area are equally difficult or easy.

Table 1: Level of Mastery (n = 381)

Area	Level of Mastery (Per Cent Items Correct)			
	25% or less	26%-50%	51%-75%	76% or more
	(Per Cent of Students)			
Agricultural Occupations	2	15	46	37
Leadership	21	34	35	10
Animal Science	4	22	47	27
Crop and Soil Science	7	26	52	15
Agricultural Mechanics	3	12	54	31
All Items	3	15	64	18

A closer look at the data reveals that 37 percent of the students performed successfully at the 76 percent or more level of mastery on agricultural occupations items. The other percentages of students performing at that level of mastery were 31 percent for agricultural mechanics items; 27 percent for animal science items; 15 percent for crop and soil science items; and 10 percent for leadership items.

### Teachers' Estimates

One of the most interesting outcomes of the study is the finding relating to this question: How accurately can teachers estimate their students' level of mastery on the criterion-referenced tests? The question could be phrased in another way: How well do teachers know what competencies their students possess?

For 65 of the items on crop and soil science, agricultural mechanics, and animal science, teachers were asked to estimate what percent of their students would be able to answer each item correctly. Only one of the 31 teachers correctly estimated his students' level of mastery on one-half or more of the 65 items. Thirteen of the 31 teachers correctly estimated their students' level of mastery on one-third or more of the 65 items. Another interesting finding appears when we look at the items on which teachers incorrectly estimated their students' level of mastery. When the incorrectly estimated items are analyzed, 27 of 31 teachers overestimated their students' level of performance on a higher proportion of items than they underestimated their students' level of performance.

### Some Questions

As we analyze these data, we should be cautious in our criticism or praise of vocational agriculture programs in grades 9 and 10. The findings were on a statewide basis, and teachers remind us that different ability levels of students and the sampling of program content in local schools may be factors to consider when interpreting the results of program outcomes. Still, there are several questions that need consideration.

What level of performance should we expect of students who have completed two years of instruction in agriculture? Do the findings indicate that we are doing an adequate job or should we revise programs or teaching techniques to enhance student learning? Perhaps we need to review and evaluate course content and establish more specific criteria on which to base evaluation.

The finding with considerable implications is that generally teachers did not accurately estimate students' level of mastery. Does this imply that students are not learning what teachers say they are teaching, or should there be renewed emphasis on evaluation of programs and teaching? Teachers need to evaluate what they are teaching and follow up teaching with measures to assess student competencies.

As the quotation at the beginning of the article mentions, are students understanding what we think they are, and are we saying what we think?

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This article is based on the author's Ph.D. dissertation, "Criterion-Referenced Assessment of Ninth and Tenth-Grade Instruction in Vocational Agriculture," which was completed at The Ohio State University, 1973.

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#### ON THE CONSOLIDATION OF VOCATIONAL TEACHER EDUCATION

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As a family was sitting down to the noon meal one Sunday, the husband asked his wife a question. "Why do you always cut both the ends off the ham?"

His wife replied, "That is the way my mother taught me."

A few weeks later this family had the opportunity to visit with the wife's mother. The husband asked his wife's mother the question, "Why did you teach my wife to cut off the ends of the ham before she cooks it?"

The mother replied, "That was the way my mother taught me."

Some time later a trip to the wife's grandmother was planned. When the family arrived at Grandma's house, the husband immediately asked, "When you cook, why do you cut both ends off the ham?"

The grandmother replied, "I have only one pan to cook ham in and I have to cut the ends off the ham to make it fit into the pan."