

Methods of Teaching Agriculture

SECOND EDITION

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Preface

What is public education in agriculture like? What are the factors that have been found to influence the effectiveness of teaching and learning? Why should problem solving be a major emphasis in teaching agriculture? How does one decide about what content to teach, and when to teach it, and for how long? How does one plan for effective teaching? What are some good techniques that every teacher of agriculture should have the ability to use? How does a teacher develop an appropriate classroom climate by managing student behavior? Agriculture teachers need to have students apply what is learned; how can learning be applied in the laboratory, in supervised agricultural experience programs, and in the FFA organization? What special provisions are needed in teaching disadvantaged and handicapped students, or in teaching adult students? What techniques are helpful in assessing the extent to which students have learned?

Competence in teaching methods, along with competence in the technical subject matter, is essential to be effective as a teacher of agriculture. This book has been designed to be of use in preservice and inservice education courses. Course syllabi were solicited by the authors from a broad range of teacher education institutions. The content of the syllabi served as the basis for the content of this book. Part One deals with the foundation for methods of teaching agriculture; Part Two, the methods for teaching and learning; Part Three, the application of learning; Part Four, the special needs of unique populations; and Part Five, the procedures for evaluating teaching and learning. The book should prove useful as a text or reference in courses related to teaching methods, introduction or orientation to agricultural education, course or program planning, supervised agricultural experience, youth organizations or FFA, laboratory management, teaching disadvantaged and handicapped students, teaching adults, and evaluation of learning.

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Part One

Foundations for Methods in Agricultural Education

Teachers of agriculture need an understanding of the foundations upon which effective teaching is built. Educational theory is only important as it is applied by teachers in improving instruction for students.

Chapter 1 provides an orientation to the reader concerning the purposes of public school education in agriculture, the clientele served, subject matter organization and content, and principles of learning. This background is important in developing and improving knowledge and skill in the planning, delivering, and evaluating of instruction. The reader who studies this introductory chapter will develop an understanding of the nature of public school education in agriculture.

One who desires to improve as a teacher will want to learn how to apply principles of teaching and learning in schools. How can a teacher use these principles in instruction? The reader of Chapter 2 will be advised on how to apply principles of learning related to organization and structure of subject matter, readiness, motivation, student involvement, student success, reinforcement and reward, directed learning, problem solving, and practice. Utilization of these psychological principles in teaching is advocated because they have been determined to be related to greater learning by students.

Organization and structure in teaching results in greater learning. The document which provides organization and structure is the course of study as a blueprint or design for instruction, providing a rationale for course content, a vehicle for communicating what students will learn, a basis for lesson planning, improved student learning, and a means of securing instructional resources. The teacher responsibility for course development is outlined. A step-by-step procedure for course of study development is provided. Teachers who study and apply the instruction in Chapter 3 will enhance their ability to organize and structure the content for their courses. The need for continual updating of the course of study is stressed.

Problem solving as an approach to teaching and learning has been emphasized throughout the history of public school education in agriculture. People tend to learn

through a logical thought process that approximates the problem-solving approach to teaching. In Chapter 4, principles of learning are shown to be related to each step of the problem-solving approach. This chapter sets the stage for Part Two, "Methods for Teaching and Learning."

Chapter 1

Factors Influencing Decisions About Teaching

POSITION AVAILABLE— TEACHER OF AGRICULTURE

Public school system needs a teacher of agriculture with expertise in group and individualized instruction. Must be competent in teaching youth, adults, and disadvantaged and handicapped students. Knowledge of and the ability to apply principles of teaching and learning expected. Application of learning by students must be managed in the laboratory, in FFA organization activities, and in programs of supervised practice. Problem-solving teaching to be used. Teacher responsible for course of study development, lesson planning, and evaluation of student learning. Thorough understanding of agricultural education in the public schools a prerequisite. Preference to applicants committed to serve in a community as an agriculturalist and an educator. Submit résumé to the Superintendent of Schools.

Being a teacher of agriculture in the public schools is challenging. One is responsible for much more than classroom and laboratory instruction. However, the primary task of any teacher is helping students learn. In the process of helping students learn, teachers plan, deliver, and evaluate instruction. The extent to which those who are taught acquire new knowledge, skills, and attitudes is determined primarily by two factors. The first is the expertise of teachers in the subject matter taught. The second is their knowledge, understanding, and ability to put into practice what is known about teaching and learning. Prospective and practicing teachers of agriculture need help to further develop their competence to plan, deliver, and evaluate instruction. Reading, study, and instruction about methods of teaching agriculture can provide much of that help.

OBJECTIVES

Effective teachers consider several factors when making decisions about teaching techniques and strategies. Teaching does not take place in a vacuum. The reader

of this chapter will be able to make decisions about instruction within a context that includes:

1. The purposes and objectives to be achieved through the instructional program; in this case, the purposes of public school education in agriculture.
2. The clientele being taught—their interests, aspirations, experiences, and characteristics.
3. The organization and content of the subject matter being taught.
4. The psychology of learning—what is known about some basic principles of teaching and learning.
5. The knowledge and skill of the teacher not only in the subject matter being taught but also in planning, delivering, and evaluating instruction.

INTERRELATIONSHIP OF THE FIVE FACTORS

Thoughtful consideration of the factors influencing decision making about instruction indicated in Figure 1-1 reveals two important ideas. First, it is clear that the five factors, while influencing instructional strategies and techniques directly, are interrelated and mutually dependent. Purposes and objectives of instructional programs are not derived in isolation from the clientele who are to be taught. Likewise, purposes and objectives influence directly the subject matter or content that will be taught. Knowledge of the principles of teaching and learning indicates how subject matter is best organized to optimize learning. In a similar manner, characteristics of learners influence decisions about teaching techniques.

A second important idea that becomes evident when the five factors influencing decisions about teaching are considered is that in any particular teaching situation, four of the five factors are relatively fixed. In real situations teachers are confronted with clearly defined instructional programs designed to achieve stated objectives for a rather precisely identified clientele at a particular point in time. In addition, the storehouse of what is known about teaching and learning at a given point in time is relatively stable. Consequently, the factor influencing decision making about instruction that is most flexible and potentially responsive to change is the knowledge and skill of the teacher.

This basic idea—that teachers' knowledge and skills are major influences of instructional decision making and, in turn, learning outcomes—undergirds this book. Each of the chapters is designed to instruct teachers of agriculture and those preparing to teach agriculture in the fundamental theory and the important principles of teaching and learning. Each chapter is also written to describe and illustrate how teachers can apply these understandings in planning for, delivering, and evaluating instruction. The purpose of this chapter is to describe how the objectives of instructional programs, clientele to be taught, subject matter, and the psychology of learning influence decisions teachers must make about instruction if those taught are to achieve high levels of competence.

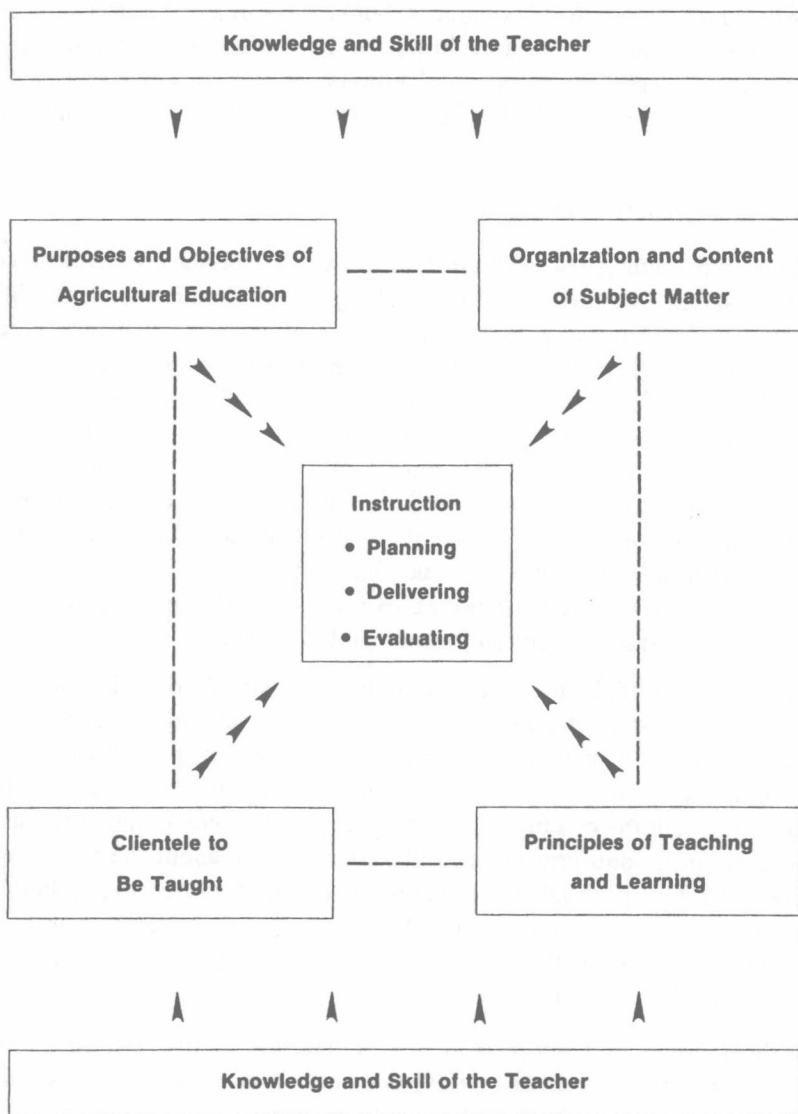


Figure 1-1. Factors influencing decisions about instruction.

PUBLIC SCHOOL EDUCATION IN AGRICULTURE

Agricultural subject matter is taught at all levels in the public schools, from the kindergarten to the university. In kindergarten and the elementary grades, agricultural topics appear as instruction about animals and plants, nutrition and food, and how people live, work, and play. Outdoor education activities in elementary schools deal largely with agriculture and conservation of natural resources. Agriculture as a specific course or a distinct and identifiable unit of instruction appears

sometimes in the junior high school grades, but courses in agriculture are most often offered at the senior high school level; in post-secondary schools, technical institutes, and community colleges; in colleges and universities; and in adult and continuing education programs offered by high schools and post-secondary schools and colleges.

Objectives of Instruction in Agriculture

Instruction pertaining to agricultural topics as well as specifically identified courses in agriculture serves a variety of purposes and objectives. The purposes and objectives of instruction in agriculture vary depending on the level at which instruction is provided and the persons for whom the instruction is offered. It is important that teachers of agriculture be aware of and understand the range of objectives for educational programs to which instruction in agriculture contributes. Few if any agricultural education programs are designed to emphasize equally all of the objectives for agricultural education discussed in this section. Usually, specific agricultural education programs are designed primarily to accomplish one of the objectives described; however, teachers need to be alert to the fact that a particular agriculture course or unit of instruction designed to accomplish a specific objective may, for some students, contribute to the attainment of other equally important, meaningful objectives.

Develop Avocational and Practical Arts Interests, Knowledge, and Skills. The agricultural industry—the production of food and fiber and the related complex of agribusiness and industry—is an essential and important part of the economic, political, and social concerns of the nation and the world. Persons who are knowledgeable about the community, state, and nation in which they live must have some appreciation for and knowledge and understanding about the role of agriculture in their lives. One purpose of instruction in agriculture is to develop knowledge and skills that contribute to the general education and avocational interests of persons who are not or will not be occupationally engaged in the agricultural industry. Specifically, instruction about agriculture contributes to:

- Understanding and appreciation of agriculture to the welfare of all; the interrelationships between agriculture and other aspects of business and commerce; the contribution of agriculture to world trade; and the interrelationships between rural and urban people.
- Understanding and appreciation of the complex processes of food production, processing, and distribution and the part of the cost of food acquired at each step of the process.
- Awareness of the responsibilities of all citizens in influencing public policies that affect agriculture.
- Familiarization and appreciation of the history of agriculture and rural life, the advances made in agriculture and their impact on all citizens, the values of rural people, and the literature, art, and music that give insight into our rural heritage.

- Practical knowledge and skills useful in engaging in avocational interests such as landscaping, conserving natural resources, raising food, performing mechanical skills, and using open spaces in urban areas as well as rural areas for leisure activities.

Instruction in agriculture that has as its major purpose the development of avocational and practical arts knowledge and skill is most applicable for students in school and adults who are not engaged in an agricultural occupation. In many cases, subject matter pertaining to agriculture is taught in the elementary grades and in general agriculture and practical arts courses taught in junior high schools and in some senior high schools. Examples of longstanding practical arts programs in agriculture are the school gardening program which was conducted in the Cleveland Public Schools and the elementary and junior high school agricultural education programs in the Los Angeles School District. Instruction offered by high schools and community colleges as regular or continuing education courses in landscaping, flower arranging, lawn care, and mechanical skills for persons not engaged in an agricultural occupation are examples of instruction designed primarily to develop avocational and practical arts knowledge and skill in agriculture.

Frequently, instruction in agriculture that has avocational and practical arts objectives as its focus is given by elementary school teachers and teachers of other courses in the school rather than by persons whose teaching specialty is agriculture. When this is the case, teachers of agriculture in these schools have an opportunity and a responsibility to provide consultative assistance to other teachers who teach about agriculture and involve students in school activities involving agriculture and rural life. In some junior high schools, and to a lesser extent in senior high schools, teachers who are specialists in agriculture are employed to teach quarter-, semester-, or year-long practical arts courses in agriculture.

Provide Exploration of and Orientation to Occupations Requiring Knowledge and Skill in Agriculture. Specialists in the psychology of vocational and career development indicate that vocational choice is one of the major concerns of adolescents, particularly as they proceed from early to late adolescence. Emancipation from parents and the home, attainment of economic self-sufficiency, and recognition as an adult are achieved largely through successfully selecting, preparing for, and becoming established in an occupation.

Vocational decision making is a process, not an event. Many factors, including awareness of and knowledge about occupations, are involved as persons make vocational and career decisions. Vocational choices are made from the occupations of which a person is aware. There is evidence that occupational choices are made in terms of what persons know about themselves and what they know about the world of work. Emotional needs influence the occupation choice process; however, knowledge about occupational areas and specific jobs is also important. Actual work experience is crucial for the reality testing that is a part of the occupational choice process.

Instruction in agriculture, particularly for adolescents and preadolescents, must

have as one of its objectives to provide information and experiences about occupations involving knowledge and skill in agriculture, the type of preparation needed for entry and progress in these occupations, the attributes of those who are successful in these occupations, and the outlook for employment or self-employment and advancement. Agricultural education programs that emphasize occupational exploration and orientation, if this objective is to be achieved, must provide opportunities for students to participate in actual work experience. For junior high school students and some older adolescents this reality testing in the world of work begins with observational experience on farms and in agribusiness firms. To be most effective, instruction designed to teach about the world of work must, if at all possible, provide actual work experience in one or more agricultural occupations. Instructional programs designed to emphasize occupational exploration and orientation provide students information about and experience in a variety of occupations rather than specialized information and extensive experience in one job or occupational area.

Develop Knowledge and Skill for Occupational Competence. Occupational proficiency—preparation for and advancement in the world of work—is generally stated as the major purpose of agricultural education in the public schools. Almost all agricultural education offered in the secondary and post-secondary public schools in the United States is vocational and technical education in agriculture. Agricultural education programs in secondary and post-secondary schools are financed in part by federal and state funds earmarked for vocational education in addition to local funds allocated for the support of public schools. Currently, two-thirds of the total enrollment in federal- and state-assisted agricultural education programs is high school students. Another one-fourth is adults and youth who have completed or left school; the remainder, less than one-tenth, is students enrolled in post-secondary technical education programs in area schools, technical institutes, and community colleges.

Major program objectives for vocational and technical education in agriculture developed by a joint committee of the U.S. Office of Education and the American Vocational Association are:

- To develop agricultural competencies needed by individuals engaged in or preparing to engage in production agriculture and in agricultural occupations other than production agriculture.
- To develop an understanding of and appreciation for career opportunities in agriculture and the preparation needed to enter and progress in these occupations.
- To develop the ability to secure satisfactory placement and to advance in an agricultural occupation through a program of continuing education.
- To develop abilities in human relations essential in agricultural education.
- To develop abilities to exercise and follow effective leadership in fulfilling occupational, social, and civic responsibilities.¹

¹Joint Committee of the U.S. Office of Education and the American Vocational Association. *Objectives for Vocational and Technical Education in Agriculture*. Washington, D.C.: U.S. Government Printing Office, 1965.

These program objectives for vocational and technical education in agriculture emphasize the development of occupational competence; however, the objectives also pertain to occupational exploration and orientation and to the development of two general education skills—human relations and leadership abilities. This combination of objectives emphasizes the point made earlier that agricultural education programs are frequently designed to contribute to more than one educational objective.

Prepare for More Advanced Study of Agriculture. A stated objective of certain agricultural education programs is to prepare those enrolled for more advanced study of agriculture. For example, instruction in agriculture at the high school level may be designed to prepare graduates for the study of agriculture in post-secondary technical institutes and community colleges or in four-year colleges and universities. Post-secondary agricultural education programs also prepare students for further study of agriculture at the university level.

Agriculture courses of this type offered in community colleges are usually described as transfer courses, indicating that the courses are intended to transfer to a four-year college or university for credit toward a baccalaureate degree. Vocational and technical education courses offered at the secondary and post-secondary levels with the primary objective of preparation for employment also allow students to learn about the opportunity and need for advanced study in agriculture. In these cases, an agricultural education program designed primarily to achieve an occupational proficiency objective may simultaneously contribute to the preparation of some students in the course for more advanced study of agriculture.

Agricultural Education as a Part of Public Education

Agricultural education programs in the public schools are designed to accomplish educational objectives that pertain specifically to acquiring appreciation, understanding, knowledge, and skills that relate directly to agricultural subject matter and to farm and nonfarm occupations that require knowledge and skill in agriculture. Agricultural education programs in the public secondary and post-secondary schools today are designed primarily to accomplish the objective of preparation for occupational competence. It is also important that agricultural education programs be designed and conducted such that instruction in agriculture contributes to the achievement of all purposes of the school. In addition to the vocational development of those enrolled, public education is concerned with the students, intellectual, social, and cultural development as well. Instruction in agriculture can contribute to other purposes of public education without neglecting a major commitment to and responsibility for preparation for work.

Teachers of agriculture must be aware that skills necessary for occupational success include the ability to read, write, speak, and listen; competence to use numbers; and the ability to work cooperatively and harmoniously with others. These skills are taught in what is usually referred to as the general education part of the

curriculum. Teachers of agriculture need to realize that instruction in agriculture also can contribute to the attainment of these purposes.

Teachers of agriculture can assist in relating instruction in agriculture more closely with the rest of the school's program in two ways. First, teachers through their comments and actions can communicate directly and indirectly to students that what they are studying in English, mathematics, science, and the other academic courses is relevant to their interests and goals. Second, teachers of agriculture must make it evident that instruction in agriculture contributes directly to the attainment of general skills relevant to communication, computation, problem solving and decision making, human relations, and leadership. To maximize this contribution of agricultural education to the overall objectives of the school requires that teachers make a conscious and deliberate effort. Good teachers of agriculture make important contributions to the understanding and use of the social sciences, mathematics, biological and natural sciences, and English. Agriculture is an applied science, so it is not unreasonable to expect that some of the best teaching of science will be done in courses in agriculture. One of the basic premises of FFA is the development of some very important general education attitudes and skills, particularly citizenship and leadership abilities.

Too often agricultural education is regarded primarily as a function of a department of the school, not as a function of the total school system. Teachers of agriculture need to plan and conduct instructional programs such that agricultural education, while achieving specific and unique objectives related to agriculture, is considered an integral part of the school system. It is also important that teachers use instructional techniques and strategies which make it possible for instruction in agriculture to contribute directly and substantially to all purposes of the school.

Clientele Taught in Agricultural Education

There is a high degree of interdependence among educational objectives for a particular agricultural education program, the content and organization of the educational program, and the clientele who enroll in the instructional program. Not only are agricultural education programs designed to accomplish one or more educational objectives, but programs are designed for specific clientele groups. Agricultural education can be provided to students enrolled in public schools and adults and youth who have completed or left schools through several types of programs.

The major groups of clientele served through agricultural education programs at the present time in the United States are secondary school students enrolled in agricultural education programs, post-secondary school students enrolled in technical programs in agriculture, and out-of-school adults enrolled in vocational programs to improve their occupational competence. Since the enactment of federal legislation providing appropriations earmarked specifically for vocational and technical education in agriculture, these have been the groups of clientele served primarily through federal- and state-aided vocational education in the public schools. There are opportunities for teachers of agriculture to design and conduct