A STUDY OF THE IMPORTANCE OF INDIVIDUALIZED INSTRUCTIONAL TECHNIQUES IN AGRICULTURAL MECHANICS AS EXPRESSED BY AGRICULTURAL MECHANICS INSTRUCTORS AND AGRICULTURAL MECHANICS EMPLOYEES

by 6791

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CHAPTER I

INTRODUCTION

The National Vocational Act of 1917 provided a program of training for persons fourteen years of age or older who were engaged or preparing to engage in production agriculture. This act was later enlarged by the National Vocational Education Act of 1963, to provide training for agricultural related occupations. In 1964, a Committee of the American Vocational Association revised the major objectives of vocational and technical education to include a program of training to develop agricultural competencies needed by individuals engaged in or preparing to engage in agricultural occupations other than production agriculture.[1]

One of the major programs of training growing out of the 1963 National Vocational Education Act was Agricultural Mechanics. With the advent of this training program, new educational media had to be developed and teaching techniques and materials had to be considered concurrently with the development of instructional materials.

Juergenson[2] indicated the Vocational Education Act of 1963 created funds to develop many instructional materials, especially

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[1] Joint Committee of the U. S. Office of Education and the American Vocational Association, Objectives for Vocational and Technical Education in Agriculture (Washington, D. C.: United States Department of Health, Education, and Welfare, 1966), pp. 5-6.

[2] E. M. Juergenson, "Instructional Materials and the Teacher," Agricultural Education Magazine, (May, 1968), p. 243.

in agriculture. He further indicated some excellent materials were developed and ordered by many schools, but never used.

Warmbrod[3] reported instructional material developed in agriculture varied from traditional student reference materials to innovations such as programmed instruction, single-concept film loops, and audio-tutorial systems. He further stated many efforts were built around the concept of individualizing education.

This report concerned a study of the individualized instructional techniques perceived as important by agricultural mechanics employees and agricultural mechanics instructors. The study centered on the assumption that if agricultural mechanics training programs were to meet the objectives of vocational and technical education, they must utilize the most effective educational techniques available and involve business and industry in the development of educational media, teaching techniques, and teaching materials.

Statement of the Problem

The problem for study and reported herein was to determine the individualized instructional techniques Agricultural Mechanics Instructors and Agricultural Mechanics Employees perceived to be important in Agricultural Mechanics Courses of Study in Community

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[3] J. Robert Warmbrod, "Appropriate Uses of Methods and Materials," Agricultural Education Magazine, (May, 1968), pp. 243-244.

Junior Colleges, Vocational Technical Schools, and Company Service Schools in the United States.

Objectives

It was the purpose of the study (1) to determine the individualized instructional techniques perceived as important by instructors in Agricultural Mechanics Courses of Study at Community Junior Colleges and Vocational Technical Schools in the United States and (2) to determine the individualized instructional techniques which Agricultural Mechanics Employees working in Agricultural Machinery Dealerships at Dodge City, and Garden City, Kansas perceived important in learning the same materials.

Limitations of the Study

The study was limited to the thirty-one agricultural mechanics employees in agricultural machinery dealerships in Dodge City, and Garden City, Kansas. The study was also limited to the forty-one instructors in agricultural mechanics courses of study who returned questionnaires. Another limitation was that the responses from the agricultural mechanics instructors were taken from over the United States while the responses from agricultural mechanics employees were taken from the geographic area of Dodge City, and Garden City, Kansas. The investigator was employed by the Community Junior College at Dodge City, Kansas.

Dodge City, the county seat of Ford County, is located in Southwest Kansas and has an estimated population of 15,000. Garden City, located fifty-two miles west of Dodge City, is the county seat of Finney County and has an estimated population of 13,000. The basic industries of the two counties were crop and livestock production. As reported in the 1970 Kansas Statistical Abstract,[4] Ford County contained 966 farms which averaged 722 acres each while Finney County contained 608 farms which averaged 1,245 acres each. Finney County contained 103,738 acres of land under irrigation, which was considerably more than the 16,667 acres reported under irrigation in Ford County. Irrigation was quite important in these counties as the average annual precipitation was near twenty inches.

Both counties were quite active in manufacturing as Ford County contained forty-one establishments which gave an added value of 12,100,000 dollars by manufacturing while Finney County contained thirty-one establishments which added a value of 8,500,000 dollars by manufacturing.

The curriculum areas included in this study were those offered in the Agricultural and Diesel Mechanics Curriculum in the Agricultural Technology Department at Dodge City Community College. This curriculum was established in 1966, and was funded by a grant obtained through the Higher Education Act of 1965.

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[4]Institute for Social and Environmental Studies, Kansas Statistical Abstract (Lawrence, Kansas: The University of Kansas, 1971), pp. 151-155.

Definition of Terms

The following terms were set aside for special definition as they applied to the study and may have varied somewhat from those in ordinary usage. The references, Audio-Visual Methods in Teaching[5] and "Definitions of Terms in Technical and Practical Arts Education,"[6] were helpful in defining the following terms:

Agricultural Mechanics Course of Study. A program for the training of agricultural mechanics as provided by the National Vocational Education Act of 1963.

Agricultural Mechanic Employee. Person who works in an agricultural machinery dealership and who was employed in the service department for at least three years and who had attended a company service school.

Audio-Visual Media. Instructional materials that are either projected visually or presented auditorally.

Community Junior College. An institution of higher education which offered the first two years of college instruction, frequently grants an associate degree, and does not grant a bachelor's degree.

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[5]Edgar Dale, Audio-Visual Methods in Teaching (New York: The Dryden Press, 1946), pp. 37-52.

[6]Committee of Publications, Definitions of Terms Used in Vocational, Technical, and Practical Arts Education (Washington, D. C.: American Vocational Association, Inc., /n.d./), pp. 3-23.

It is an independently organized institution or an institution which is a part of the public school system, or an independently organized system of junior colleges. It is operated by a board of education of a local basic administrative unit and instruction is adapted in content, level, and schedule to the needs of the local community.

Company Service School. A short-session course of instruction organized, sponsored, and operated by an agricultural machinery company for the purpose of training and upgrading agricultural mechanics employees employed in agricultural machinery dealerships.

Contrived Experience. An editing of reality which makes the reality easier to understand. It may be a model of the actual object or a mock-up which changes and simplifies the real object.

Demonstration. Process whereby the instructor shows students how a certain thing is done, regardless of whether the student only observes or is asked to do what he has just been shown how to do.

Field Trip. A planned visitation by a student or group of students to some establishment outside the classroom for the purpose of observing or seeking firsthand information about its operation or of acquiring skills and experiences not possible in the classroom.

Individualized Instruction. The organization of instructional materials in a manner that will permit student self-instruction as he progresses in accord with his own abilities and interests.

Laboratory or Work Experience. Learning by direct participation with responsibility for the outcome. It is an experience that is seen, handled, tasted, felt, touched, or smelled.

Motion Pictures. All variations of pictures involving motion whether the motion is silent, combines sight and sound, combines sound with three-dimensional sight, and whether the picture is in full color or black and white.

Programmed Instruction. Instructional material broken down into an ordered sequence of small units where the student must respond in some specified way to each unit. The student response is reinforced by immediate knowledge of the correctness of response and the student moves in small steps at his own pace.

Still Pictures. One-dimensional aid, specifically, photographs, slides, and filmstrips.

Tape Recorder. A one-dimensional audio aid where instructional material is first recorded on a tape and played back to the student, either individually or to a group of students.

Television. All variations of material presentation where the instructional presentation is through a television monitor.

Verbal Symbol. Designation that has no resemblance to the object for which it stands. It may be a word, concept, scientific principle, formula, or any other representation of experience that has been classified in some verbal symbolism. Includes textbooks, bulletins,and manuals.

Visual Symbol. An abstract representation of literal reality, specifically, charts, graphs, and maps.

Vocational Technical School. A secondary school under public supervision and control and supported by public funds which provides instruction that will enable high school youth and adults to prepare for, enter, and progress in a skilled trade or occupation of their choice.

CHAPTER II

RELATED INFORMATION

In preparation for the study, a survey of literature was made and no studies were found which were similar to the one being planned. The information available, however, seemed to indicate three main categories with relation to individualized instruction. They were: individualized instructional techniques in use; application of individualized instructional techniques; and development of individualized instruction.

Individualized Instructional Techniques in Use

Instructional media is valued differently by educators from one time period to another. In a 1962 nationwide study of school practices and expectations, Lange[1] reported secondary school principals gave the top rank to textbooks when asked to rank the usefulness of the various resources to secondary schools. However, by 1965-66, the principals expected locally produced curriculum materials to be most useful. He further stated that when principals were asked to estimate the use of instructional innovations, they indicated that films and filmstrips were most frequently used with the greatest actual and expected increase in the use of tape recorders.

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[1]Phil C. Lange, "The Use of Printed and Audio-Visual Materials for Instructional Purposes: Secondary Education." Paper read at the Conference on the Use of Printed and Audio-Visual Materials for Instructional Purposes, Columbia University, February, 1966.

Juergenson[2] reported television, single-concept films, dial access retrieval, language laboratories, learning centers, computerized instruction, teaching machines, and programmed instruction was being used in schools. He further stated that many aids were simply better ways of doing things teachers already knew how to do and what teachers were already doing.

Dale[3] indicated sensory materials could be readily classified as they moved from the most abstract to the most direct kind of learning. He developed the "cone of experience" to explain the inter-relationships between the various types of audio-visual materials, as well as their individual positions in the learning process. Each position of the cone represented a stage between direct experience and pure abstraction. Beginning with the most direct to the most abstract, he listed ten divisions as follows: direct, purposeful experiences; contrived experiences; dramatic participation; demonstrations; field trips; exhibits; motion pictures; radio, recordings, and still pictures; visual symbols; and verbal symbols. He indicated that direct experiences, contrived experiences, and dramatic participation involved doing. Demonstrations, field trips, exhibits, motion pictures, radio, recordings, and still pictures involved observing. Visual symbols and verbal

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[2]E. M. Juergenson, "Instructional Materials and the Teacher," Agricultural Education Magazine, (May, 1968), p. 243.

[3]Edgar Dale, Audio-Visual Methods in Teaching (New York: The Dryden Press, 1946), pp. 37-52.

symbols he indicated as symbolizing.

Pautz[4] reported that eighty-five percent of what we know came from sight, eleven percent through hearing, and four percent via touch, taste, and smell. He further indicated that media must be planned to fit the learning situation and the proper techniques and media must be selected to fit the situation. He further stated that teachers should prepare, use, and understand all forms of media while schools should be planned with an instructional media center.

The future of programmed instruction appeared hopeful, reported Nordmann.[5] He indicated many advantages in using programmed instruction, including: immediate feedback to the student; allowing the teacher to determine exactly what part of the instruction sequence needed improving when students did not learn a specific item; more and better education provided for both advanced and retarded students by allowing students to proceed at their own pace with program sequences adjusted to their own work level; and reduced drudgery work for the teacher.

Fry[6] indicated the whole field of programming was defined by three basic principles. These were: using small units of information; forcing the student to respond to each unit; and informing the student

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[4]Norman Pautz, "For More Effective Teaching, Use Audio-Visual Materials," Agricultural Education Magazine, (April, 1969), p. 238.

[5]Bernard J. Nordmann, Jr., Teaching Machines and Programmed Instruction: An Introduction and Review, (Urbana, Illinois: Department of Computer Science, 1968), p. 19.

[6]Edward B. Fry, Teaching Machines and Programmed Instruction: An Introduction (New York: McGraw-Hill Book Company, Inc., 1963), pp. 41-42.

of the correctness of the response. He stated these were the identifying features of programs and all programs were produced with this general framework.

Application of Individualized Instructional Techniques

Stetler[7] indicated that educational media should be related to the specific educational objectives in the context of the teaching-learning situation. He further stated media assisted teachers in introducing new areas of learning for further study by students as well as reinforcing values being emphasized in the curriculum. With a variety of media available, the teacher should select the stimuli which would be most likely to be effective for each student. In so doing, more effective utilization of teachers' talent would be facilitated through the use of new educational media. The media could also be used to implement concepts of large and small group instruction and individualized learning.

Warmbrod[8] indicated some of the newer individualized instructional materials emphasized content of instruction primarily in terms of basic principles likely to lead to subject-centered curriculum and deductive strategies of teaching in contrast to student-centered instructional programs and inductive approaches of learning. He

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[7]Byron F. Stetler, Developing the Use of New Educational Media (Washington, D. C.: Council of Chief State School Officers, /n.d./, pp. 5-7.

[8]J. Robert Warmbrod, "Appropriate Uses of Methods and Materials," Agricultural Education Magazine, (April, 1969), p. 238.

further stated a second danger in current instructional material development in effort to individualize instruction could fail to take into consideration the individual abilities, interests, and needs of students. With regard to material development enhancing the teaching-learning process, he stated the first concern was the student and an effective approach to teaching and learning.

In a 1961-63 study using programmed instruction to teach Farm Credit to high school and adult students, and a 1962 study using programmed instruction to teach an introductory bacteriology course to college students, McClay[9] reported high school and college students could learn factual information through the use of programmed materials by self-instruction. However, students preferred learning the subject with the help of a teacher. He further indicated good programmed material preparation involved considerable time and effort of competent teachers.

Heaney[10] indicated the following advantages of single-concept 8mm loop films: films could be developed so information was supplied to students in small meaningful units with repetition when needed; subject matter could be selected that related directly to classroom and laboratory instruction; 8mm single-concept loop film and projector

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[9]David R. McClay, "A Test of Programmed Instruction in Farm Credit," Agricultural Education Magazine, (October, 1964), pp. 100-101.

[10]Donald S. Heaney, "The Media With a Great Future--8mm Single Concept Loop Films," Agricultural Education Magazine, (June, 1970), p. 315.

were easy to use and relatively inexpensive to develop; they were designed for individual use and for use by small groups; the slow learner could spend as much time as required and repeat the film as many times as necessary; gifted students could use loop films to enrich instruction; and laboratory exercises could be demonstrated effectively.

Video tapes allowed flexibility in instruction reported Hoerner.[11] Ease of viewing materials by getting close-ups on small objects was possible and individuals and information that could not ordinarily be brought into the classroom and thereby become part of instruction. He further stated the videotape added variety to instruction which promoted interest and motivation. It was best used as a supplement to classroom instruction rather than the only means of presenting subject matter, and that if overused, its effectiveness greatly decreased. Other visuals such as the overhead projector, models, charts, and the chalkboard could be used in conjunction with the video tape.

Development of Individualized Instruction

Clymer and Kearney[12] indicated the teacher was the key to curriculum and instructional provisions, and that material centers,

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[11]Hoerner, "Videotape: An Aid in Teacher Education," Agricultural Education Magazine, (September, 1969), pp. 60-61.

[12]Theodore Clymer and Norman C. Kearney, "Curricular and Instructional Provisions for Individual Differences," Individualizing Instruction, Nelson B. Henry, editor (The Sixty-First Yearbook of the National Society for the Study of Education, Chicago: The University of Chicago Press, 1962), p. 282.

time blocks, small classes, scheduling, grouping, curriculum guides, and audio-visual aids were only devised to facilitate teaching. Only as the teacher utilized the resources available to him in organizing his class and carrying out an instructional program, adjusted to needs of students, could progress be made in developing the potential of students.

Glaser[13] reported individualized education should provide a system of individualized instruction which nurtures independent learning and a learning environment adapted to the needs of each student. He indicated six fundamental requirements for individualization which had to be met if progress in individualized instruction was to be realized. They were as follows:

1. Conventional grade level boundaries and time limitations for subject matter coverage had to be redesigned.

2. Adequate evaluation of a student's progress through a curriculum sequence was necessary.

3. Well defined sequences of behaviorally defined objectives had to be used as study guides for individualized students.

4. Instructional materials appropriate for self-directed learning were needed.

5. Professional training of school personnel in student evaluation and guidance were needed.

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[13]Robert Glaser, The Education of Individuals, (Pittsburgh: Learning Research and Development Center, University of Pittsburgh, 1966), pp. 5-9.

6. Use of student profiles, automation, and other techniques by teachers was necessary in designing individualized instruction programs.

Hartenberger[14] reported five important factors that influenced a school's ability to individualize instruction. Most important was the level of expectation the community held in regard to quality education. High expectations usually meant the community was willing to pay the higher costs created by individualized instruction. Secondly, the teacher had to be able to instill in students the dedication for excellence in personal development. The environment of the classroom, thirdly, had to be conducive to the fulfillment of learning, involving whatever materials and personnel were necessary if every student was to work to the limit of his capabilities. Fourthly, the school plant had to change its shape whenever necessary as individualized education was a fluid activity, and the fifth factor was the implications of financing the proposed individualized instructional program had to be put to a careful study before actual implementation.

Lambert[15] reported certain changes in teacher role and responsibility had to come about when attempting to develop an individualized instructional program. He indicated teacher knowledge of the definition of individualized instruction had to be up-graded to mean

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[14]Walter L. Hartenberger, "Developing an Individualized Instructional Program," The College of Education Record, (December, 1965), pp. 39-42.

[15]Roger Lambert, "Helping Teachers Use Units to Individualize Instruction." Paper read at the Central State Seminar in Agricultural Education, Chicago, Illinois, February 16, 1970.

instruction based on the needs, interests, and abilities of the individual student. Philosophy of instruction had to be altered from the traditional teacher-class relationship while the teacher's role in the classroom had to be changed to a coordinator of instruction rather than a disseminator of information. Expectations for the student's role in learning had to change as the student became responsible for his own learning and required more freedom of movement in school and outside of school as his learning experiences required. Students went through instructional experiences by themselves that formerly required the teacher as an overseer. Operation of audio-visual equipment, certain kinds of field trips, small group study sessions and laboratory or work experience programs could be incorporated into the student's learning experiences.

Lambert[16] further indicated certain steps involved in developing individualized instruction. The students had to be prepared for individualized instruction and understand the fundamental principles involved. Secondly, students had to set realistic objectives and develop a plan for accomplishing the selected objectives. Student learning results had to be shared with the whole class and evaluation of accomplishment had to be on the basis of how well the student met his stated objectives.

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[16] Ibid.

It would appear there has been considerable research on the use, application, and development of individualized instructional techniques. The related information also indicated that if setting up an individualized instructional program, the teacher's role in the classroom had to be changed from a disseminator of information to a coordinator of instruction, while the student had to be prepared for individualized instruction and set realistic objectives and develop a plan for accomplishment of the selected objectives.

CHAPTER III

METHOD OF RESEARCH

In order to meet the objectives set forth in the study, a questionnaire and questionnaire statement were developed with the assistance of Dr. James Albracht of Kansas State University, Mr. Jim Jett, manager of an agricultural machinery dealership in Dodge City, and Mr. Robert Rosebrook, owner and manager of a general engine rebuilding establishment in Dodge City.

The Questionnaire

The questionnaire contained ten curriculum areas which were included in the Agricultural and Diesel Mechanics curriculum of the Agricultural Technology Department at Dodge City Community College at the time of the study. For each curriculum area, there were eleven audio-visual media which could be used as individualized instructional techniques for that curriculum area.

The curriculum areas included: small gas engine diagnosis and overhaul; gas tractor engine diagnosis and overhaul; diesel tractor engine diagnosis and overhaul; tractor transmission and final drive overhaul; tractor electrical system testing and repair; tractor hydraulic system testing and repair; farm machinery adjustment; farm machinery repair; arc welding; and acetylene welding.

The eleven audio-visual media which could be used in individualized instruction for each curriculum area included: verbal symbols; visual symbols; still pictures; motion pictures; television; tape recorders; field trips; demonstrations; contrived experiences; laboratory exercises; and programmed instruction.

To test the questionnaire for proper procedure, it was administered to eight agricultural instructors and two general mechanics not included in the study. After the test, minor adjustments were made as indicated by the experience.

The questionnaire was administered to sixty-two agricultural mechanics instructors in junior colleges and vocational-technical schools in the United States offering agricultural mechanics courses of study as listed in the 1968-69 Directory of "Technical Education Curriculums in Agriculture and Natural Resources in the United States of America."[1] The questionnaire was also administered to the thirty-one agricultural mechanics employed in agricultural machinery dealerships in Dodge City, and Garden City, Kansas.

Responses were received from all thirty-one agricultural mechanics employees of the agricultural machinery dealerships in Dodge City, and Garden City, Kansas. Forty-three of the sixty-two agricultural mechanics instructors responded, giving a sixty-nine and

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[1] Fred William Manley, "1968-69 Directory of Technical Education and Natural Resources in the United States of America," (Raleigh, North Carolina, 1969).

four-tenths percent return. However, two questionnaires from agricultural mechanics instructors were not included in the study as the agricultural mechanics courses of study were no longer offered in their school.

Analysis of the Results

The responses given to the questionnaire were analyzed by assigning a weighted value to the responses for the audio-visual media which could be used as individualized instructional techniques for each curriculum area. Each item was rated as follows: "Essential," four points; "Very Important," three points; "Important," two points; "Little Importance," one point; and "No Importance," zero points. A sum average was derived by averaging the instructor's weighted average with the employee's weighted average.

Tables were prepared which listed the eleven audio-visual media for each curriculum area and the weighted responses for both the agricultural mechanics instructors and the agricultural mechanics employees. The results were then presented in tabular forms, described and analyzed.

An additional table was prepared which listed the eleven audio-visual media and the average of the weighted responses for each audio-visual media for both the agricultural mechanics instructors and agricultural mechanics employees. A sum average for each response was derived by averaging the agricultural mechanics instructors weighted

average with that of the agricultural mechanics employees. The results included in each table were analyzed and a description prepared.

After the results were analyzed, the findings were summarized and conclusions were drawn on the basis of the data collected and recommendations were made for further investigation and study.

CHAPTER IV

ANALYSIS OF DATA

Information concerning the response of forty-one agricultural mechanics instructors and thirty-one agricultural mechanics employed in agricultural machinery dealerships, at the time of the study, were analyzed by assigning a weighted value to the responses for the audio-visual media which could be used as individualized instructional techniques for each of the curriculum areas. Media which were rated as "Essential" were assigned 4 points; "Very Important," 3 points; "Important," 2 points; "Little Importance," 1 point; and "No Importance," 0 points.

After the individual responses were obtained for each media, the points for each media in each curriculum area were added together and divided by the number of responses; thirty-one in the case of the agricultural mechanic employees and forty-one in the case of the agricultural mechanics instructors, thus giving an average weighted response. A total sum average was obtained by adding together the average weighted response of the agricultural mechanics instructors and the average weighted response of the agricultural mechanics and dividing the sum by two. Hereafter, agricultural mechanics instructors are referred to as instructors and agricultural mechanics employees as employees.

In order to meet the objectives of the study, it was the decision of the investigator that media be classified as: "Essential," those items receiving 3.5 to 4.0 points; "Very Important," 2.50 to 3.49 points; "Important," 1.50 to 2.49 points; "Little Importance," 0.50 to 1.49 points; and "No Importance," 0.0 to 0.49 points. When the media was perceived as an important individualized instructional technique in teaching and learning, it would be included in the curriculum program.

The information presented in the questionnaire included the curriculum areas included in the Agricultural and Diesel Mechanics curriculum in the Agricultural Technology Department at Dodge City Community College. The data for the study were obtained by a questionnaire mailed to the agricultural mechanics instructors, and by personal interviews of the agricultural mechanics employees.

Small Gas Engine Diagnosis and Overhaul

The responses of the instructors and mechanics in Table I indicated that the instructors perceived laboratory or work experience (3.83) as an essential individualized instructional technique in learning small gas engine diagnosis and overhaul. Mechanics viewed verbal symbols (3.48), visual symbols (3.13), demonstrations (2.90), contrived experiences (3.26), laboratory or work experience (3.32), and programmed instruction (2.74) as very important. Instructors saw verbal symbols (2.54), visual symbols (3.19), still pictures (2.68), demonstrations (3.49), and contrived experience (3.15) as

TABLE I

THE RESPONSES OF FORTY-ONE AGRICULTURAL MECHANICS INSTRUCTORS AND THIRTY-ONE AGRICULTURAL MECHANICS EMPLOYEES ON INDIVIDUALIZED INSTRUCTIONAL TECHNIQUES FOR SMALL GAS ENGINE DIAGNOSIS AND OVERHAUL

Individualized instructional techniques	Instructors wt. avg.	Employees wt. avg.	Total sum avg.
Verbal symbols: texts, bulletins, and manuals	2.54	3.48	3.01
Visual symbols: charts, graphs, and diagrams	3.19	3.13	3.16
Still pictures: slides and filmstrips	2.68	1.87	2.27
Motion pictures and film loops	2.29	1.42	1.85
Television	1.00	.68	.84
Tape recorders	.83	1.13	.98
Field trips	1.78	2.45	2.12
Demonstrations	3.49	2.90	3.19
Contrived experiences: models and mock-ups	3.15	3.26	3.20
Laboratory or work experience	3.85	3.32	3.57
Programmed instruction	2.32	2.74	2.53

Note: Essential, 4 points
Very Important, 3 points
Important, 2 points
Little Importance, 1 point
No Importance, 0 points

very important. Important individualized instructional techniques were field trips (1.78), programmed instruction (2.30), and motion pictures (2.29) for instructors and field trips (2.45) and still pictures (1.87) for mechanics. Television (1.00) and tape recorders (.83) were viewed as having little importance by instructors as were they viewed by mechanics (.68 and 1.13, respectively). Motion pictures (1.42) were also perceived as having little importance by mechanics.

The responses of the employees and instructors in Table I indicated that only instructors viewed one media as an essential individualized instructional technique for small gas engine diagnosis and overhaul, that being laboratory or work experience. Employees saw no media as essential, but along with the instructors, viewed verbal symbols, visual symbols, demonstrations, and contrived experience as very important. In addition, employees saw laboratory or work experience and programmed instruction as very important, while instructors perceived still pictures as very important also. Important to the employees were still pictures and field trips and to the instructors, motion pictures, field trips, and programmed instruction. Employees and instructors viewed television and tape recordings as having little importance. Employees also viewed motion pictures as having little importance as an individualized instructional technique for small gas engine diagnosis and overhaul.

Gas Tractor Engine Diagnosis and Overhaul

The data in Table II indicated instructors perceived three media essential for individualized instructional techniques in gas tractor engine diagnosis and overhaul. They were: verbal symbols (3.56), demonstrations (3.66), and laboratory or work experience (3.93). Employees viewed two of these media as essential, those being verbal symbols (3.71) and laboratory or work experience (3.64). Demonstrations (3.09) and programmed instruction (2.81) were viewed as very important by employees as were visual symbols (3.22), still pictures (2.80), and contrived experiences (3.00) by instructors. Employees saw still pictures (2.09), motion pictures (1.58), and field trips (2.26) as only important while instructors also viewed motion pictures (2.29) and field trips (2.07) as only important, along with programmed instruction (2.15). Television (1.00) and tape recorders (.85) were perceived as having little importance by instructors and also by employees (.84 and .68, respectively).

The responses in Table II indicated that both instructors and employees perceived verbal symbols and laboratory or work experience as essential individualized instructional techniques for gas tractor engine diagnosis and overhaul. While instructors perceived demonstrations as essential, employees viewed them as very important. Instructors and employees believed visual symbols and contrived experiences as very important individualized instructional techniques for gas tractor engine diagnosis and overhaul. Instructors' replies indicated

TABLE II

THE RESPONSES OF FORTY-ONE AGRICULTURAL MECHANICS INSTRUCTORS AND THIRTY-ONE AGRICULTURAL MECHANICS EMPLOYEES ON INDIVIDUALIZED INSTRUCTIONAL TECHNIQUES FOR GAS TRACTOR ENGINE DIAGNOSIS AND OVERHAUL

Individualized instructional techniques	Instructors wt. avg.	Employees wt. avg.	Total sum avg.
Verbal symbols: texts, bulletins, and manuals	3.56	3.71	3.63
Visual symbols: charts, graphs, and diagrams	3.22	3.36	3.29
Still pictures: slides and filmstrips	2.80	2.09	2.44
Motion pictures and film loops	2.29	1.58	1.93
Television	1.00	.84	.92
Tape recorders	.85	.68	.76
Field trips	2.07	2.26	2.16
Demonstrations	3.66	3.09	3.37
Contrived experiences: models and mock-ups	3.00	2.93	2.96
Laboratory or work experience	3.93	3.64	3.78
Programmed instruction	2.15	2.81	2.48

Note: Essential, 4 points
Very Important, 3 points
Important, 2 points
Little Importance, 1 point
No Importance, 0 points

they considered still pictures to be very important while employees perceived them only as important. The reverse was true for programmed instruction. Both the instructors and employees perceived motion pictures and field trips as important and television and tape recorders as having little importance as individualized instructional techniques for gas tractor engine diagnosis and overhaul.

Diesel Tractor Engine Diagnosis and Overhaul

The replies of the instructors and employees in Table III indicated that instructors rated verbal symbols (3.51), demonstrations (3.76), and laboratory or work experience (3.85) to be essential individualized instructional techniques for diesel tractor engine diagnosis and overhaul. Employees also perceived verbal symbols (3.81) as essential, along with visual symbols (3.80), but demonstrations (2.97) and laboratory or work experience (3.29) as very important. Instructors viewed visual symbols (3.34) as only very important. Instructors and employees both perceived contrived experiences as very important (3.00 and 2.93, respectively). Motion pictures (2.22), field trips (2.00), and programmed instruction (1.98) were considered important by instructors. Employees indicated a close similarity in their perception of what was important individualized instructional techniques for diesel tractor engine diagnosis and overhaul. They rated still pictures (2.23), motion pictures (1.61), field trips (2.09), and programmed instruction (2.42) as important. Employees and instructors both rated television (.84 and 1.00, respectively)

and tape recorders (.81 and 1.00, respectively) as having little importance as individualized instructional techniques for diesel tractor engine diagnosis and overhaul.

TABLE III

THE RESPONSES OF FORTY-ONE AGRICULTURAL MECHANICS INSTRUCTORS AND THIRTY-ONE AGRICULTURAL MECHANICS EMPLOYEES ON INDIVIDUALIZED INSTRUCTIONAL TECHNIQUES FOR DIESEL TRACTOR ENGINE DIAGNOSIS AND OVERHAUL

Individualized instructional techniques	Instructors wt. avg.	Employees wt. avg.	Total sum avg.
Verbal symbols: texts, bulletins, and manuals	3.51	3.81	3.66
Visual symbols: charts, graphs, and diagrams	3.34	3.80	3.57
Still pictures: slides and film-strips	2.95	2.23	2.59
Motion pictures and film loops	2.22	1.61	1.91
Television	1.00	.84	.92
Tape recorders	1.00	.81	.90
Field trips	2.00	2.09	2.04
Demonstrations	3.76	2.97	3.31
Contrived experiences: models and mock-ups	2.98	3.13	2.05
Laboratory or work experience	3.85	3.29	3.07
Programmed instruction	1.98	2.42	2.20

Note: Essential, 4 points
Very Important, 3 points
Important, 2 points
Little Importance, 1 point
No Importance, 0 points

The replies of the instructors and employees in Table III would indicate instructors and employees viewed verbal symbols as essential individualized instructional techniques in learning diesel tractor engine diagnosis and overhaul. Instructors also rated demonstrations and laboratory or work experience as essential while employees viewed visual symbols as essential. Visual symbols, still pictures, and contrived experiences were considered to be very important by instructors. Employees considered demonstrations, contrived experiences, and laboratory or work experience as very important. Motion pictures, field trips, and programmed instruction were perceived as important by instructors and employees. In addition, employees indicated still pictures as important. Television and tape recorders were viewed as having little importance by employees and instructors as individualized instructional techniques for diesel tractor engine diagnosis and overhaul.

Tractor Transmission and Final Drive Overhaul

The responses of the instructors and employees in Table IV indicated instructors perceived demonstrations (3.61) and laboratory or work experience (3.88) essential and employees viewed verbal symbols (3.68) essential as individualized instructional techniques for tractor transmission and final drive overhaul. Verbal symbols (3.77), visual symbols (3.24), still pictures (3.00) and contrived experiences (3.17) were stated to be very important by instructors

TABLE IV

THE RESPONSES OF FORTY-ONE AGRICULTURAL MECHANICS INSTRUCTORS AND THIRTY-ONE AGRICULTURAL MECHANICS EMPLOYEES ON INDIVIDUALIZED INSTRUCTIONAL TECHNIQUES FOR TRACTOR TRANSMISSION AND FINAL DRIVE OVERHAUL

Individualized instructional techniques	Instructors wt. avg.	Employees wt. avg.	Total sum avg.
Verbal symbols: texts, bulletins, and manuals	3.37	3.68	3.52
Visual symbols: charts, graphs, and diagrams	3.24	2.68	2.96
Still pictures and film loops	3.00	1.81	2.40
Motion pictures and film loops	2.24	1.52	1.88
Television	.95	.71	.83
Tape recorders	.76	.87	.81
Field trips	1.95	1.81	1.88
Demonstrations	3.61	2.77	3.19
Contrived experiences: models and mock-ups	3.17	2.09	2.63
Laboratory or work experience	3.88	3.68	3.78
Programmed instruction	2.15	3.03	2.59

Note: Essential, 4 points
Very Important, 3 points
Important, 2 points
Little Importance, 1 point
No Importance, 0 points

as were visual symbols (2.68), demonstrations (2.77), and programmed instruction (3.03) by employees. Employees perceived still pictures (1.81), motion pictures (1.52), field trips (1.81) and contrived experiences (2.09) as important, while motion pictures (2.24), field trips (1.95), and programmed instruction (2.15) were viewed to be important by instructors as individualized instructional techniques for tractor transmission and final drive overhaul. Television was rated as having little importance (.95) by instructors and employees (.71), as were tape recorders (.76) by instructors and employees (.87).

The replies of the instructors and employees in Table IV indicated that laboratory or work experience was the only media perceived essential by both instructors and employees as an individualized instructional technique for tractor transmission and final drive overhaul. Instructors viewed demonstrations as essential while employees also perceived verbal symbols as essential. Verbal symbols, visual symbols, still pictures, and contrived experiences were perceived as very important by instructors. Employees rated visual symbols, demonstrations, and programmed instruction as very important. Motion pictures and field trips received an important rating by both instructors and employees. Programmed instruction received an important rating by instructors, as did still pictures and contrived experiences by employees. Receiving little importance as individualized instructional techniques for tractor transmission and final drive overhaul by both instructors and employees were television and tape recorders.

Tractor Electrical System Testing and Repair

The responses of the instructors and employees in Table V indicated instructors perceived verbal symbols (3.51), demonstrations (3.71), and laboratory or work experience (3.85) as essential individualized instructional techniques for tractor electrical system testing and repair. Verbal symbols (3.71), visual symbols (3.64), and laboratory or work experience (3.85) were viewed as essential by employees. Those media rated very important by instructors were visual symbols (3.49), still pictures (2.85), and contrived experiences (3.24). Demonstrations (3.00), contrived experience (3.19), and programmed instruction (3.13) were rated as very important by employees. Instructors viewed motion pictures (2.27), field trips (1.54), and programmed instruction (2.27) as being important individualized instructional techniques for tractor electrical system testing and repair. Employees rated still pictures (2.06) as being important. Having little importance as individualized instructional techniques for tractor electrical system testing and repair were television (.93) and tape recorders (.88) for instructors and motion pictures (1.42), television (.77), tape recorders (.71), and field trips (1.48) for employees.

The computations in Table V for instructors and employees indicated that verbal symbols and laboratory or work experience were both viewed as essential individualized instructional techniques for tractor electrical system testing and repair by instructors and employees. Visual symbols were perceived as essential by employees

TABLE V

THE RESPONSES OF FORTY-ONE AGRICULTURAL MECHANICS INSTRUCTORS AND THIRTY-ONE AGRICULTURAL MECHANICS EMPLOYEES ON INDIVIDUALIZED INSTRUCTIONAL TECHNIQUES FOR TRACTOR ELECTRICAL SYSTEM TESTING AND REPAIR

Individualized instructional techniques	Instructors wt. avg.	Employees wt. avg.	Total sum avg.
Verbal symbols: texts, bulletins, and manuals	3.51	3.71	3.61
Visual symbols: charts, graphs, and diagrams	3.49	3.64	3.56
Still pictures: slides and filmstrips	2.85	2.06	2.45
Motion pictures and film loops	2.27	1.42	1.84
Television	.93	.77	.85
Tape recorders	.88	.71	.79
Field trips	1.54	1.48	1.51
Demonstrations	3.71	3.00	3.35
Contrived experiences: models and mock-ups	3.24	3.19	3.21
Laboratory or work experience	3.85	3.55	3.73
Programmed instruction	2.27	3.13	2.70

Note: Essential, 4 points
Very Important, 3 points
Important, 2 points
Little Importance, 1 point
No Importance, 0 points

but were rated as very important by instructors. The reverse was true for demonstrations. Instructors and employees both rated contrived experiences as very important. While still pictures were scored very important by instructors, they received only an important rating by employees. The reverse was true for programmed instruction. Motion pictures and field trips were considered to be important individualized instructional techniques for tractor electrical system testing and repair, but were perceived by employees as having little importance. Television and tape recorders were considered to have little importance as individualized instructional techniques for tractor electrical system testing and repair by both instructors and employees.

Tractor Hydraulic System Testing and Repair

The replies of the instructors and employees in Table VI indicated that instructors perceived demonstrations (3.56) and laboratory or work experience (3.83) to be essential individualized instructional techniques for tractor hydraulic system testing and repair. Employees perceived visual symbols (3.64) and also laboratory or work experience (3.71) as essential. Being very important to instructors were verbal symbols (3.44), visual symbols (3.46), still pictures (2.90), and contrived experiences (3.29). In addition to verbal symbols (3.17) and contrived experiences (3.39), employees also rated demonstrations (3.26) and programmed instruction (3.03) to be very important individualized instructional techniques for tractor

TABLE VI

THE RESPONSES OF FORTY-ONE AGRICULTURAL MECHANICS INSTRUCTORS AND THIRTY-ONE AGRICULTURAL MECHANICS EMPLOYEES ON INDIVIDUALIZED INSTRUCTIONAL TECHNIQUES FOR TRACTOR HYDRAULIC SYSTEM TESTING AND REPAIR

Individualized instructional techniques	Instructors wt. avg.	Employees wt. avg.	Total sum avg.
Verbal symbols: texts, bulletins, and manuals	3.44	3.17	3.30
Visual symbols: charts, graphs, and diagrams	3.46	3.64	3.55
Still pictures: slides and filmstrips	2.90	2.35	2.62
Motion pictures and film loops	2.27	1.64	1.95
Television	.95	.84	.89
Tape recorders	.93	.90	.91
Field trips	1.76	1.84	1.80
Demonstrations	3.56	3.26	3.41
Contrived experiences: models and mock-ups	3.29	3.39	3.34
Laboratory or work experience	3.83	3.71	3.77
Programmed instruction	2.37	3.03	2.70

Note: Essential, 4 points
Very Important, 3 points
Important, 2 points
Little Importance, 1 point
No Importance, 0 points

hydraulic system testing and repair. Motion pictures (2.27), field trips (1.76), and programmed instruction (2.37) were perceived as only important by instructors while employees rated still pictures (2.35), motion pictures (1.64) and field trips (1.84) as being important. Television (.95) and tape recorders (.93) were perceived to be of little importance by instructors and also received a rating of little importance (.84 and .90, respectively) by employees as individualized instructional techniques for tractor hydraulic system testing and repair.

The data in Table VI indicated that laboratory or work experience was perceived by instructors and employees as being an essential individualized instructional technique for tractor hydraulic system testing and repair. While instructors believed demonstrations to be essential and visual symbols to be very important, the reverse was true for employees. Verbal symbols and contrived experiences were perceived as very important by both instructors and employees. While still pictures were viewed as very important and programmed instruction as important by instructors, employees believed the reverse to be true. Motion pictures and field trips were rated as important by both instructors and employees. Perceived to have little importance as an individualized instructional technique for tractor hydraulic system testing and repair, by both instructors and employees, were television and tape recorders.

Farm Machinery Adjustment

The information in Table VII indicated that instructors perceived verbal symbols (3.51), demonstrations (3.61), and laboratory or work experience (3.83) as essential individualized instructional techniques for farm machinery adjustment. Employees viewed verbal symbols (3.64) and visual symbols (3.55) as essential. Field trips (2.81), demonstrations (3.35), contrived experiences (3.18), laboratory or work experience (3.26), and programmed instruction (2.61) were reported as very important by employees. Instructors reported visual symbols (3.22), still pictures (2.56), field trips (2.54), and contrived experiences (2.90) as very important media as individualized instructional techniques for farm machinery adjustment. Motion pictures (2.09) and programmed instruction (2.15) were considered as only important by instructors while employees viewed still pictures (2.00) as important. Receiving only little importance by employees were motion pictures (1.48), television (.74), and tape recorders (.74). Instructors also viewed television (.98) and tape recorders (.78) as having little importance as individualized instructional techniques for farm machinery adjustment.

The data collected in Table VII indicated that instructors viewed verbal symbols, demonstrations, and laboratory or work experience as essential individualized instructional techniques for farm machinery adjustment. Employees viewed verbal symbols as essential, but included visual symbols in the same category.

TABLE VII

THE RESPONSES OF FORTY-ONE AGRICULTURAL MECHANICS INSTRUCTORS AND THIRTY-ONE AGRICULTURAL MECHANICS EMPLOYEES ON INDIVIDUALIZED INSTRUCTIONAL TECHNIQUES FOR FARM MACHINERY ADJUSTMENT

Individualized instructional techniques	Instructors wt. avg.	Employees wt. avg.	Total sum avg.
Verbal symbols: texts, bulletins, and manuals	3.51	3.64	3.57
Visual symbols: charts, graphs, and diagrams	3.22	3.55	3.38
Still pictures: slides and filmstrips	2.56	2.00	2.28
Motion pictures and film loops	2.09	1.48	1.78
Television	.98	.74	.86
Tape recorders	.78	.74	.86
Field trips	2.54	2.81	2.67
Demonstrations	3.61	3.35	3.48
Contrived experiences: models and mock-ups	2.90	3.18	3.04
Laboratory or work experience	3.83	3.26	3.54
Programmed instruction	2.15	2.61	2.38

Note: Essential, 4 points
Very Important, 3 points
Important, 2 points
Little Importance, 1 point
No Importance, 0 points

Instructors reported visual symbols as very important along with still pictures, field trips, and contrived experiences. Field trips and contrived experiences were also rated as very important by employees, along with demonstrations, laboratory or work experience, and programmed instruction. Programmed instruction received an important rating by instructors, along with motion pictures. Whereas instructors viewed still pictures as very important, employees rated them as important. Employees also rated motion pictures as having little importance. Employees and instructors both rated television and tape recorders as having little importance as individualized instructional techniques for farm machinery adjustment.

Farm Machinery Repair

The computations in Table VIII showed that instructors viewed only laboratory or work experience (3.85) essential as an individualized instructional technique for farm machinery repair. Verbal symbols (3.74) and visual symbols (3.55) were both reported as essential by employees. Instructors perceived verbal symbols (3.39), visual symbols (3.22), still pictures (2.51), demonstrations (3.49), and contrived experience (2.79) as very important while employees viewed as very important: demonstrations (3.13), contrived experience (3.16), laboratory or work experience (3.26), and programmed instruction (2.85). Programmed instruction (2.15), field trips (2.22), and motion pictures (2.00) received an important rating by instructors while employees considered still pictures (2.03) and field trips (2.45) to be

TABLE VIII

THE RESPONSES OF FORTY-ONE AGRICULTURAL MECHANICS INSTRUCTORS AND THIRTY-ONE AGRICULTURAL MECHANICS EMPLOYEES ON INDIVIDUALIZED INSTRUCTIONAL TECHNIQUES FOR FARM MACHINERY REPAIR

Individualized instructional techniques	Instructors wt. avg.	Employees wt. avg.	Total sum avg.
Verbal symbols: texts, bulletins, and manuals	3.39	3.74	3.56
Visual symbols: charts, graphs, and diagrams	3.22	3.55	3.38
Still pictures: slides and filmstrips	2.51	2.03	2.27
Motion pictures and film loops	2.00	1.48	1.74
Television	.90	.74	.82
Tape recorders	.73	.81	.77
Field trips	2.22	2.45	2.33
Demonstrations	3.49	3.13	3.31
Contrived experience: models and mock-ups	2.79	3.16	2.93
Laboratory or work experience	3.85	3.26	3.55
Programmed instruction	2.15	2.85	2.49

Note: Essential, 4 points
Very Important, 3 points
Important, 2 points
Little Importance, 1 point
No Importance, 0 points

important. Instructors perceived television (.90) and tape recorders (.73) as having little importance. Employees reported motion pictures (1.48), television (.74), and tape recorders (.81) as having little importance as individualized instructional techniques for farm machinery repair.

The replies of the instructors in Table VIII indicated that instructors viewed laboratory or work experience as an essential individualized instructional technique for farm machinery repair. Whereas employees perceived verbal symbols and visual symbols as essential, instructors rated them as very important, along with still pictures, demonstrations, and contrived experiences. In addition to laboratory or work experience and programmed instruction, employees also listed demonstrations and contrived experiences as very important individualized instructional techniques for farm machinery repair. Instructors believed programmed instruction as important along with field trips and motion pictures. Field trips were also rated important by employees along with still pictures. Employees considered motion pictures, television, and tape recorders as having little importance. Television and tape recorders were also rated by instructors as having little importance as individualized instructional techniques for farm machinery repair.

Arc Welding

Demonstrations (3.74) and laboratory or work experiences (3.93), as shown in Table IX, were reported by instructors to be

TABLE IX

THE RESPONSES OF FORTY-ONE AGRICULTURAL MECHANICS INSTRUCTORS AND THIRTY-ONE AGRICULTURAL MECHANICS EMPLOYEES ON INDIVIDUALIZED INSTRUCTIONAL TECHNIQUES FOR ARC WELDING

Individualized instructional techniques	Instructors wt. avg.	Employees wt. avg.	Total sum avg.
Verbal symbols: texts, bulletins, and manuals	3.09	3.09	3.09
Visual symbols: charts, graphs, and diagrams	2.95	3.03	2.99
Still pictures: slides and filmstrips	2.51	1.64	2.07
Motion pictures and film loops	2.12	1.16	1.64
Television	1.02	.87	.94
Tape recorders	.66	1.16	.91
Field trips	1.24	2.55	1.89
Demonstrations	3.74	3.19	3.46
Contrived experiences: models and mock-ups	2.68	3.45	3.06
Laboratory or work experience	3.93	3.26	3.59
Programmed instruction	2.00	2.87	2.43

Note: Essential, 4 points
Very Important, 3 points
Important, 2 points
Little Importance, 1 point
No Importance, 0 points

essential individualized instructional techniques for arc welding. Employees indicated demonstrations (3.19) and laboratory or work experience (3.26) to be very important, along with verbal symbols (3.09), visual symbols (3.03), contrived experiences (3.45), programmed instruction (2.87), and field trips (2.55). Instructors also reported contrived experiences (2.68), verbal symbols (3.09), and visual symbols (2.95), along with still pictures (2.51), to be very important individualized instructional techniques for arc welding. Whereas employees rated programmed instruction as very important, instructors reported programmed instruction (2.00) to be important, along with motion pictures (2.12). Employees rated still pictures (1.64) as important and motion pictures (1.16), television (.87), and tape recorders (1.16) as having little importance as individualized instructional techniques for arc welding. Television (1.02), tape recorders (.66), and field trips (1.24) were rated by instructors as having little importance as individualized instructional techniques for arc welding.

The information in Table IX indicated that employees viewed none of the instructional techniques as essential for arc welding. Whereas instructors replied that demonstrations and laboratory or work experience were essential, employees viewed them as very important, along with verbal symbols, visual symbols, field trips, contrived experiences, and programmed instruction. Instructors also perceived verbal symbols, visual symbols, and contrived experiences, along with still pictures, as very important individualized instructional

techniques for arc welding. Whereas programmed instruction was rated as very important and still pictures as important by employees, instructors perceived the reverse to be true. Instructors also perceived motion pictures as being important while employees rated them as having little importance. Television, tape recorders, and field trips were perceived as having little importance by instructors. Employees also considered television and tape recorders, along with motion pictures, as having little importance as individualized instructional techniques for arc welding.

Acetylene Welding

The data contained in Table X indicated that instructors viewed demonstrations (3.68) and laboratory or work experience (3.93) as essential individualized instructional techniques for acetylene welding. Employees perceived laboratory or work experience (3.93) as the only essential technique. Verbal symbols (3.09), visual symbols (3.00), still pictures (2.51), and contrived experience (2.71) were rated as very important by instructors. Employees also replied that verbal symbols (3.26), visual symbols (2.97), and contrived experiences (3.06), along with demonstrations (3.48) and programmed instruction (2.90), were very important individualized instructional techniques for acetylene welding. Motion pictures (2.07) was the only technique which received an important rating by instructors. However, employees viewed still pictures (1.77) and field trips (1.65) as being important and motion pictures (1.23),

TABLE X

THE RESPONSES OF FORTY-ONE AGRICULTURAL MECHANICS INSTRUCTORS AND THIRTY-ONE AGRICULTURAL MECHANICS EMPLOYEES ON INDIVIDUALIZED INSTRUCTIONAL TECHNIQUES FOR ACETYLENE WELDING

Individualized instructional techniques	Instructors wt. avg.	Employees wt. avg.	Total sum avg.
Verbal symbols: texts, bulletins, and manuals	3.09	3.26	2.17
Visual symbols: charts, graphs, and diagrams	3.00	2.97	2.98
Still pictures: slides and filmstrips	2.51	1.77	2.14
Motion pictures and film loops	2.07	1.23	2.15
Television	.93	.65	.74
Tape recorders	.61	.71	.66
Field trips	1.39	1.65	1.52
Demonstrations	3.68	3.48	3.58
Contrived experiences: models and mock-ups	2.71	3.06	2.88
Laboratory or work experience	3.93	3.77	3.85
Programmed instruction	2.22	2.90	2.56

Note: Essential, 4 points
Very Important, 3 points
Important, 2 points
Little Importance, 1 point
No Importance, 0 points

television (.65), and tape recorders (.71) as having little importance. Instructors perceived television (.93), tape recorders (.61) and field trips (1.39) as having only little importance as individualized instructional techniques for acetylene welding.

The results of the computations in Table X indicated that instructors viewed demonstrations and laboratory or work experience as essential individualized instructional techniques for acetylene welding. Employees also perceived laboratory or work experience to be essential, but viewed demonstrations, along with contrived experiences, programmed instruction, visual symbols, and verbal symbols as very important. Verbal symbols, visual symbols, and contrived experiences, along with still pictures, were also perceived as very important by instructors as individualized instructional techniques for acetylene welding. Motion pictures and programmed instruction were reported as being important by instructors, while employees replied that still pictures and field trips were important. Television, tape recorders, and field trips received a rating of little importance by instructors, while employees perceived motion pictures, television, and tape recorders as having little importance as individualized instructional techniques for acetylene welding.

Average Weighted Responses

The data collected indicated that verbal symbols were believed to be an essential individualized instructional technique in four

curriculum areas and very important in the other six by instructors. Employees indicated a somewhat close correlation by rating verbal symbols as essential in six of the curriculum areas and very important in the remaining four. Visual symbols were perceived as very important individualized instructional techniques by instructors in all ten curriculum areas, while employees viewed them as essential in five curriculum areas and very important in the remaining five areas.

Still pictures were rated as very important individualized instructional techniques in all ten curriculum areas, whereas, employees viewed still pictures as important in all ten areas. Instructors perceived motion pictures as important individualized instructional techniques in all ten curriculum areas. However, employees indicated motion pictures to be important in four curriculum areas and as having little importance in six curriculum areas. Television and tape recorders were ranked by both instructors and employees as having little importance as individualized instructional techniques in all ten curriculum areas. Field trips received a somewhat varied rating with instructors responses indicating them as very important in one curriculum area, important in seven curriculum areas, and as having little importance in two curriculum areas. Employees responses showed a somewhat close correlation to that of the instructors as they viewed field trips as very important in two curriculum areas, important in seven curriculum areas, and as having little importance in one curriculum area.

Demonstrations were perceived as being very important individualized instructional techniques in all ten curriculum areas by employees and essential in eight curriculum areas and very important in two curriculum areas by instructors. The responses of both the instructors and employees indicated contrived experiences as being very important in all ten curriculum areas. Laboratory or work experience was perceived as essential in all ten curriculum areas by instructors, whereas, employees rated laboratory or work experience as essential in five curriculum areas and very important in the remaining five areas. Programmed instruction was considered as a very important individualized instructional technique in nine curriculum areas and as important in the other area by employees. Instructors perceived programmed instruction an important individualized instructional technique in all ten curriculum areas.

In order to obtain an over-all indication of the value placed on each individualized instructional technique for the employees and instructors, a total average weighted response was obtained by adding together the average weighted response for each individualized instructional technique, for both the instructors and employees, and dividing the sum by ten (the number of curriculum areas). As some correlation was shown between the responses of the instructors and employees, a total sum average was derived which indicated an overall importance of each of the individualized instructional techniques. The sum average was obtained by adding together the total average

weighted responses of the instructors and employees for each curriculum area and dividing the sum by two.

The data collected in Table XI indicated that instructors perceived demonstrations (3.63) and laboratory or work experience (3.87) as essential individualized instructional techniques for agricultural mechanics courses of study. Employees did not appear to perceive any of the individualized instructional techniques as essential, but rated verbal symbols (3.49), visual symbols (3.33), demonstrations (3.11), contrived experiences (3.08), laboratory or work experience (3.47), and programmed instruction (2.84) as very important. Instructors also perceived verbal symbols (3.30), visual symbols (3.23), and contrived experiences (3.08), along with still pictures (2.72), as very important individualized instructional techniques for agricultural mechanics courses of study. Employees considered still pictures (1.98) important, along with field trips (2.14). Instructors also rated field trips (1.85) as important, along with motion pictures (2.19) and programmed instruction (2.18). Television (.97) and tape recorders (.80) were considered as having only little importance to instructors as individualized instructional techniques for agricultural mechanics courses of study. Employees also considered television (.77) and tape recorders (.85), along with motion pictures (1.45), as having little importance as individualized instructional techniques for agricultural mechanics courses of study.

The total average weighted responses in Table XI indicated that instructors perceived demonstrations and laboratory or work

TABLE XI

THE TOTAL AVERAGE WEIGHTED RESPONSE OF FORTY-ONE AGRICULTURAL MECHANICS INSTRUCTORS AND THIRTY-ONE AGRICULTURAL MECHANICS EMPLOYEES ON INDIVIDUALIZED INSTRUCTIONAL TECHNIQUES FOR THE TEN CURRICULUM AREAS INCLUDED IN THE AGRICULTURAL MECHANICS COURSE OF STUDY

Individualized instructional techniques	Instructors wt. avg.	Employees wt. avg.	Total sum avg.
Verbal symbols: texts, bulletins, and manuals	3.30	3.49	3.39
Visual symbols: charts, graphs, and diagrams	3.23	3.33	3.28
Still pictures: slides and filmstrips	2.72	1.98	2.35
Motion pictures: slides and filmstrips	2.72	1.98	2.35
Television	.97	.77	.87
Tape recorders	.80	.85	.82
Field trips	1.85	2.14	1.99
Demonstrations	3.63	3.11	3.37
Contrived experiences: models and mock-ups	2.98	3.08	3.03
Laboratory or work experience	3.87	3.47	3.67
Programmed instruction	2.18	2.84	2.51

Note: Essential, 4 points
Very Important, 3 points
Important, 2 points
Little Importance, 1 point
No Importance, 0 points

experience as essential individualized instructional techniques for the curriculum areas included in the agricultural mechanics course of study. Employees rated no individualized instructional techniques as essential; however, they indicated verbal symbols, visual symbols, demonstrations, contrived experiences, laboratory or work experience, and programmed instruction as very important. Instructors also rated verbal symbols, visual symbols, and contrived experiences as very important. Whereas employees rated programmed instruction as very important and still pictures as important, the reverse was true of what the instructors considered very important and important. Both instructors and employees rated field trips as important individualized instructional techniques for the curriculum areas in the agricultural mechanics course of study. Responses indicated instructors perceived motion pictures important while employees believed them to be of little importance. Television and tape recorders were rated by both instructors and employees as having little importance as individualized instructional techniques for the curriculum areas included in the agricultural mechanics course of study.

The computations in Table XI indicated a high correlation between the total average weighted responses of the instructors and the total average weighted responses of the employees. The total sum average of the total weighted responses indicated that employees and instructors viewed laboratory or work experience (3.67) as an essential individualized instructional technique for the curriculum areas included in the agricultural mechanics course of study. Those

individualized instructional techniques which were perceived by instructors and employees as very important, in decreasing importance were: verbal symbols (3.39); demonstrations (3.37); visual symbols (3.28); contrived experiences (3.03); and programmed instruction (2.51). Still pictures (2.35), field trips (1.99), and motion pictures (1.82), ranked in decreasing importance, were rated as important individualized instructional techniques for the curriculum areas included in the agricultural mechanics course of study. Instructors and employees both placed only little importance on television (.87) and tape recorders (.82) as individualized instructional techniques for the curriculum areas included in the agricultural mechanics course of study.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This report concerned a study of individualized instructional techniques perceived as important by agricultural mechanics instructors and agricultural mechanics employees. The problem was designed to determine the individualized instructional techniques agricultural mechanics instructors and agricultural mechanics employees considered important in agricultural mechanics courses of study in community junior colleges, vocational technical schools, and company service schools. The study centered on the assumption that if agricultural mechanics training programs were to meet the objectives of vocational and technical education, the most effective educational techniques should be utilized. It was also assumed that business and industry should be involved in the development of educational media, teaching techniques, and teaching materials.

A questionnaire was developed to gather data which would assist in meeting the objectives of the study. Included in the questionnaire were ten curriculum areas considered to constitute an agricultural mechanics course of study. The instrument contained eleven educational media which could be utilized as individualized instructional techniques for each curriculum area. The eleven educational media were as follows:

verbal symbols; visual symbols; still pictures; motion pictures; television; tape recorders; field trips; demonstrations; contrived experiences; laboratory or work experience; and programmed instruction.

The replies given to the questionnaire were analyzed by assigning a weighted value to the responses given. Items which were rated as "Essential" were assigned 4 points; "Very Important," 3 points; "Important," 2 points; "Little Importance," 1 point; and "No Importance," 0 points.

In order to meet the objectives set out in the study, it was the decision of the investigator that media be classified as: "Essential" when receiving 3.5 to 4.0 points; "Very Important," 2.50 to 3.49 points; "Important," 1.50 to 2.49 points; "Little Importance," 0.50 to 1.49 points; and "No Importance," 0.00 to 0.49 points.

The data collected indicated that verbal symbols were perceived an essential individualized instructional technique in four curriculum areas and very important in the other six by instructors. Employees indicated a somewhat close correlation by rating verbal symbols as essential in six of the curriculum areas and very important in the remaining four. Visual symbols were perceived as very important individualized instructional techniques by instructors in all ten curriculum areas, while employees viewed them as essential in five curriculum areas and very important in the remaining five areas.

Still pictures were rated as very important individualized instructional techniques in all ten curriculum areas, whereas,

employees viewed still pictures as only important in all ten areas. Instructors perceived motion pictures as important individualized instructional techniques in all ten curriculum areas. However, employees indicated motion pictures to be important in four curriculum areas and as having little importance in six others. Television and tape recorders were ranked by both instructors and employees as having little importance as individualized instructional techniques in all ten curriculum areas. Field trips received a somewhat varied rating with responses of instructors indicating them as very important in one curriculum area, important in seven curriculum areas, and as having little importance in two curriculum areas. Employees responses showed a somewhat close correlation to that of the instructors as they viewed field trips as very important in two curriculum areas, important in seven, and as having little importance in one.

Demonstrations were perceived as being very important individualized instructional techniques in all ten curriculum areas by employees and essential in eight curriculum areas and very important in two curriculum areas by instructors. The responses of both the instructors and employees indicated contrived experiences as being very important in all ten curriculum areas. Laboratory or work experience was perceived as essential in all ten curriculum areas by instructors, whereas, employees rated laboratory or work experience as essential in five and very important in the remaining five curriculum areas. Programmed instruction was considered as a very important individualized instructional

technique in nine curriculum areas and as important in the other area by employees. Instructors stated programmed instruction was an important individualized instructional technique in all ten curriculum areas.

In order to obtain an over-all indication of the value placed on each individualized instructional technique for the agricultural mechanics instructors and agricultural mechanics employees, a total average weighted response was obtained by adding together the average weighted responses for each individualized instructional technique, for both the instructors and employees, and dividing the sum by ten (the number of curriculum areas). As a close correlation was shown between the responses of the instructors and the employees, a total sum average was derived which indicated the overall importance of each individualized instructional technique. The sum average was obtained by adding the total average weighted responses of the instructors and employees for each curriculum area and dividing the sum by two.

The total average weighted responses indicated that instructors perceived demonstrations (3.63) and laboratory or work experience (3.97) as essential individualized instructional techniques for the curriculum areas included in the study. Employees rated no individualized instructional techniques as essential; however, verbal symbols (3.49), visual symbols (3.13), demonstrations (3.11), contrived experiences (3.08), laboratory or work experience (3.47), and programmed instruction (2.84) were indicated as very important.

Instructors rated verbal symbols (3.30), visual symbols (3.23), and contrived experiences (3.08) as very important. Instructors also perceived verbal symbols (3.30), visual symbols (3.23), and contrived experiences (3.08), along with still pictures (2.72), as very important individualized instructional techniques for agricultural mechanics courses of study. Employees rated still pictures (1.98) important, along with field trips (2.14). Instructors also rated field trips (1.85) as important, along with motion pictures (2.19) and programmed instruction (2.18). Television (.97) and tape recorders (.80) were considered as having little importance to instructors as individualized instructional techniques for agricultural mechanics courses of study. Employees also considered television (.77) and tape recorders (.85), along with motion pictures (1.45), as having little importance as individualized instructional techniques for agricultural mechanics courses of study.

The total sum average of the total weighted responses indicated that employees and instructors viewed laboratory or work experience (3.67) as an essential individualized instructional technique for the curriculum areas included in the agricultural mechanics course of study. Verbal symbols (3.39), demonstrations (3.37), visual symbols (3.28), contrived experiences (3.03), and programmed instruction (2.51), listed in decreasing importance, were perceived by agricultural mechanics instructors and agricultural mechanics employees to be very important. Still pictures (2.35), field trips (1.99), and motion pictures (1.82), ranked in decreasing importance,

were rated as being important individualized instructional techniques for the curriculum areas included in the agricultural mechanics course of study. Instructors and employees both placed only little importance on television (.87) and tape recorders (.82) as individualized instructional techniques for the curriculum areas included in the agricultural mechanics course of study.

Conclusions

As a result of the findings of the study to determine the importance of individualized instructional techniques for agricultural mechanics courses of study, the following conclusions were made:

1. Agricultural mechanics instructors and agricultural mechanics employees perceived laboratory or work experience as an essential individualized instructional technique.

2. Verbal symbols, demonstrations, visual symbols, contrived experiences and programmed instruction were considered very important individualized instructional techniques.

3. Agricultural mechanics instructors and agricultural mechanics employees considered still pictures, field trips, and motion pictures important individualized instructional techniques.

4. Television and tape recorders were perceived as having little importance as individualized instructional techniques.

5. Individualized instructional techniques were used in laboratory assignments but more conventional methods were used in classroom presentations.

6. Few individualized instructional materials had been developed in the areas of still pictures, motion pictures, television, and tape recorders for agricultural mechanics courses of study.

Recommendations

After analyzing the findings and conclusions of this study, the author made the following recommendations:

1. Studies needed to be made of the individualized instructional materials available for agricultural mechanics courses of study.

2. Studies needed to be made similar to this one involving instructors of agricultural machinery company service schools.

3. Agricultural mechanics instructors needed to be made more aware of the principles of individualized instruction.

4. Individualized instructional materials needed to be developed in the area of agricultural mechanics.

5. Studies needed to be made to see if individualized instructional materials were being developed by agricultural mechanics instructors and agricultural machinery companies, and if so, were they adapted for use in other programs of study.

7. Studies needed to be made of companies producing individualized instructional materials to see if there was a gap between what instructors used and what was available.

SELECTED BIBLIOGRAPHY

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Clymer, Theodore and Kearney, Norman C. "Curriculum and Instructional Provisions for Individual Differences," Individualizing Instruction, Nelson B. Henry, editor. The Sixty-First Yearbook of the National Society for the Study of Education. Chicago: The University of Chicago Press, 1962.

Committee of Publications. Definitions of Terms Used in Vocational, Technical, and Practical Arts Education. Washington, D. C.: American Vocational Association, Inc. /n.d./.

Hartenberger, Walter L. "Developing an Individualized Instructional Program," The College of Education Record, December, 1965.

Heaney, Donald S. "The Media with a Great Future--8mm Single Concept Loop Films," Agricultural Education Magazine, 1970.

Hoerner. "Videotape: An Aid in Teacher Education," Agricultural Education Magazine, September, 1969.

Institute for Social and Environmental Studies. Kansas Statistical Abstract. Lawrence, Kansas: The University of Kansas, 1971.

Joint Committee of the U. S. Office of Education and the American Vocational Association. Objectives for Vocational and Technical Education in Agriculture. Washington, D. C.: United States Department of Health, Education, and Welfare, 1966.

Juergenson, E. M. "Instructional Materials and the Teacher," Agricultural Education Magazine, May, 1968.

Lambert, Roger. "Helping Teachers Use Units to Individualize Instruction," Paper read at the Central State Seminar in Agricultural Education, Chicago, Illinois, February, 1970.

Lange, Phil C. "The Use of Printed and Audio-Visual Materials for Instructional Purposes: Secondary Education," Paper read at the Conference on the Use of Printed and Audio-Visual Materials for Instructional Purposes, Columbia University, February, 1966.

Manley, Fred William. "1968-69 Directory of Technical Education Curriculums in Agriculture and Natural Resources in the United States of America," Raleigh, North Carolina, 1969.

McClay, David R. "A Test of Programmed Instruction in Farm Credit," Agricultural Education Magazine, October, 1964.

Pautz, Norman. "For More Effective Teaching, Use Audio-Visual Materials," Agricultural Education Magazine, April, 1969.

Warmbrod, Robert J. "Appropriate Uses of Methods and Materials," Agricultural Education Magazine, May, 1968.

Dale, Edgar. Audio-Visual Methods in Teaching. New York: The Dryden Press, 1946.

Fry, Edward B. Teaching Machines and Programmed Instruction: An Introduction. New York: McGraw-Hill Book Company, Inc. 1963.

Glaser, Robert. The Education of Individuals. Pittsburgh: Learning Research and Development Center, University of Pittsburgh, 1966.

Nordmann, Bernard J. Jr. Teaching Machines and Programmed Instruction: An Introduction and Review. Urbana, Illinois: University of Illinois, 1968.

Stetler, Byron F. Developing the Use of New Educational Media. Washington, D. C.: Council of Chief State School Officers, n.d.

APPENDIX

DODGE CITY COMMUNITY JUNIOR COLLEGE

Dodge City, Kansas 67801

April 23, 1970

In partial fulfillment of requirements for my Master's Degree from Kansas State University, Manhattan, Kansas, I am making a study to determine the individualized or student self-instruction techniques used in Farm Power and Machinery courses in vocational classes of junior colleges and vocational technical schools in the United States.

The questionnaire lists eleven items which could be used as individualized instruction techniques for ten laboratory learning exercises. Please determine whether these items are essential, very important, little importance, or no importance as individualized instruction techniques in teaching or learning the ten exercises.

For clarity, individualized or student self-instruction shall mean: the organization of instructional materials in a manner that will permit student self-instruction as he progresses in accord with his own abilities and interests.

Programmed instruction shall refer to: instructional material broken down into an ordered sequence of small units where the student must respond in some specified way to each unit. The student response is reinforced by immediate knowledge of the correctness of response and the student moves in small steps at his own pace.

Use the enclosed pen to complete the questionnaire, if you like. Keep the pen but please return the questionnaire. You will be of invaluable help to me in this study and your cooperation will be appreciated.

Sincerely,

John Kroenlein, Instructor
Agricultural & Diesel Mechanics
Dodge City Community College

DODGE CITY COMMUNITY JUNIOR COLLEGE

Dodge City, Kansas 67801

Division of Vocational-Technical Education

QUESTIONNAIRE STATEMENT

This questionnaire will be used to determine the individualized or student self-instruction techniques which personnel working in the field of Farm Power and Machinery Mechanics believe important in learning those skills necessary for gainful employment in their field.

The questionnaire lists eleven items which could be used as individualized instruction techniques for ten laboratory learning exercises. Please determine whether these items are essential, very important, little importance, or no importance as individualized instruction techniques in learning the ten exercises.

For clarity, individualized or student self-instruction shall mean: the organization of instructional materials in a manner that will permit student self-instruction as he progresses in accord with his own abilities and interests.

Programmed instruction shall refer to: instructional material broken down into an ordered sequence of small units where the student must respond in some specified way to each unit. The student response is reinforced by immediate knowledge of the correctness of response and the student moves in small steps at his own pace.

You will be of invaluable help to me in this study and your cooperation will be greatly appreciated.

Sincerely,

John Kroenlein, Instructor
Agricultural & Diesel Mechanics
Dodge City Community College

INDIVIDUALIZED INSTRUCTION TECHNIQUES SURVEY

The questionnaire is completed by marking (X) in the appropriate column representing your opinion of the relative importance of the following as techniques of individualized or student self-instruction in learning the following functions. The general meaning of each of the number values is:

4 = Essential, highly necessary, etc.
3 = Very important, above average, etc.
2 = Important, average, moderate, etc.
1 = Little importance, low, slight, etc.
0 = No importance, none, not valuable, etc.

	4 Essential	3 Very Important	2 Important	1 Little Importance	0 No Importance
1. SMALL GAS ENGINE DIAGNOSIS AND OVERHAUL					
A. Verbal symbols: textbooks, bulletins, & manuals					
B. Visual symbols: charts, graphs, & diagrams					
C. Still pictures: slides, filmstrips					
D. Motion pictures & film loops					
E. Television					
F. Tape recorder					
G. Field trips					
H. Demonstrations					
I. Contrived experiences: models & mock-ups					
J. Laboratory or work experience					
K. Programmed instruction					
2. GAS TRACTOR ENGINE DIAGNOSIS AND OVERHAUL					
A. Verbal symbols: textbooks, bulletins, & manuals					
B. Visual symbols: charts, graphs, & diagrams					
C. Still pictures: slides, filmstrips					

	4 Essential	3 Very Important	2 Important	1 Little Importance	0 No Importance
D. Motion pictures, & film loops					
E. Television					
F. Tape recorder					
G. Field trips					
H. Demonstrations					
I. Contrived experiences: models & mock-ups					
J. Laboratory or work experience					
K. Programmed instruction					
3. DIESEL TRACTOR ENGINE DIAGNOSIS AND OVERHAUL					
A. Verbal symbols: textbooks, bulletins, & manuals					
B. Visual symbols: charts, graphs, & diagrams					
C. Still pictures: slides, filmstrips					
D. Motion pictures, film loops					
E. Television					
F. Tape recorder					
G. Field trips					
H. Demonstrations					
I. Contrived experiences: models & mock-ups					
J. Laboratory or work experience					

	4 Essential	3 Very Important	2 Important	1 Little Importance	0 No Importance
K. Programmed instruction					
4. TRACTOR TRANSMISSION AND FINAL DRIVE OVERHAUL					
A. Verbal symbols: textbooks, bulletins, & manuals					
B. Visual symbols: charts, graphs, & diagrams					
C. Still pictures: slides, filmstrips					
D. Motion pictures, & film loops					
E. Television					
F. Tape recorder					
G. Field trips					
H. Demonstrations					
I. Contrived experiences: models & mock-ups					
J. Laboratory or work experience					
K. Programmed instruction					
5. TRACTOR ELECTRICAL SYSTEM TESTING & REPAIR					
A. Verbal symbols: textbooks, bulletins, & manuals					
B. Visual symbols: charts, graphs, & diagrams					
C. Still pictures: slides, filmstrips					
D. Motion pictures, & film loops					
E. Television					

	4 Essential	3 Very Important	2 Important	1 Little Importance	0 No Importance
F. Tape recorder					
G. Field trips					
H. Demonstrations					
I. Contrived experiences: models & mock-ups					
J. Laboratory or work experience					
K. Programmed instruction					
6. TRACTOR HYDRAULIC SYSTEM TESTING & REPAIR					
A. Verbal symbols: textbooks, bulletins, & manuals					
B. Visual symbols: charts, graphs, & diagrams					
C. Still pictures: slides, filmstrips					
D. Motion pictures, & film loops					
E. Television					
F. Tape recorder					
G. Field trips					
H. Demonstrations					
I. Contrived experiences: models & mock-ups					
J. Laboratory or work experience					
K. Programmed instruction					
7. FARM MACHINERY ADJUSTMENT					

	4 Essential	3 Very Important	2 Important	1 Little Importance	0 No Importance
A. Verbal symbols: textbook, bulletins, & manuals					
B. Visual symbols: charts, graphs, & diagrams					
C. Still pictures: slides, filmstrips					
D. Motion pictures, & film loops					
E. Television					
F. Tape recorder					
G. Field trips					
H. Demonstrations					
I. Contrived experiences: models & mock-ups					
J. Laboratory or work experience					
K. Programmed instruction					
8. FARM MACHINERY REPAIR					
A. Verbal symbols: textbooks, bulletins, & manuals					
B. Visual symbols: charts, graphs, & diagrams					
C. Still pictures: slides, filmstrips					
D. Motion pictures, & film loops					
E. Television					
F. Tape recorder					
G. Field trips					

	4 Essential	3 Very Important	2 Important	1 Little Importance	0 No Importance
H. Demonstrations					
I. Contrived experiences: models & mock-ups					
J. Laboratory or work experience					
K. Programmed instruction					
9. ARC WELDING					
A. Verbal symbols: textbooks, bulletins, & manuals					
B. Visual symbols: charts, graphs, & diagrams					
C. Still pictures: slides, filmstrips					
D. Motion pictures, & film loops					
E. Television					
F. Tape recorder					
G. Field trips					
H. Demonstrations					
I. Contrived experiences: models & mock-ups					
J. Laboratory or work experience					
K. Programmed instruction					
10. ACETYLENE WELDING					
A. Verbal symbols: textbooks, bulletins, & manuals					
B. Visual symbols: charts, graphs, & diagrams					

	4 Essential	3 Very Important	2 Important	1 Little Importance	0 No Importance
C. Still pictures: slides, filmstrips					
D. Motion pictures, & film loops					
E. Television					
F. Tape recorder					
G. Field trips					
H. Demonstrations					
I. Contrived experiences: models & mock-ups					
J. Laboratory or work experience					
K. Programmed instruction					
1. RATE THE EFFECTIVENESS OF SOURCES OF MATERIALS FOR STUDENT SELF-INSTRUCTION					
A. Company materials (bulletins, charts, & aids)					
B. Government materials (bulletins, charts, & aids))					
C. Film, filmstrips, & slide companies					
D. College bulletins					
E. Textbook publishers					

GENERAL INFORMATION

lame and Address of Person Reporting-

(cont)

GENERAL INFORMATION

(cont)

Age of Person Reporting-_____

Years Experience In Farm Power and Machinery Mechanics-_____

Company or school for whom employed-_____

Years experience in present position-_____

Schools Attented:

Company Schools-_____
_____
_____
_____

Vocational technical schools-_____
_____
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_____

Armed Forces Schools-_____
_____
_____
_____

Colleges or Universities-_____
_____
_____
_____

A STUDY OF THE IMPORTANCE OF INDIVIDUALIZED INSTRUCTIONAL TECHNIQUES IN AGRICULTURAL MECHANICS AS EXPRESSED BY AGRICULTURAL MECHANICS INSTRUCTORS AND AGRICULTURAL MECHANICS EMPLOYEES

by

JOHN W. KROENLEIN

B. S., Kansas State University, 1966

AN ABSTRACT OF A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

College of Education

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1971

The study was designed to determine the individualized instructional techniques perceived as important by agricultural mechanics instructors and agricultural mechanics employees for an agricultural mechanics course of study.

The central theme of the study was based on the assumption that if agricultural mechanics training programs were to meet the objectives of vocational and technical education, the most effective instructional techniques should be utilized. It was also assumed that business and industry should be involved in the development of educational media, teaching techniques, and teaching materials.

Data were collected by a questionnaire developed with the assistance of Dr. James Albracht of Kansas State University. Data were obtained from forty-one agricultural mechanics instructors in community junior colleges and vocational technical schools in the United States and thirty-one agricultural mechanics employees in Dodge City, and Garden City, Kansas.

The responses given the questionnaire were analyzed by assigning a weighted value. Items which were rated as "Essential" were assigned 4 points; "Very Important," 3 points; "Important," 2 points; "Little Importance," 1 point; and "No Importance," 0 points. Educational media were classified as: "Essential" those which received 3.50 to 4.0 points; "Very Important," 2.50 to 3.49 points; "Important," 1.50 to 2.49 points; "Little Importance," 0.50 to 1.49 points; and "No Importance," 0.0 to 0.49 points.

It was found that agricultural mechanics instructors and agricultural mechanics employees perceived laboratory or work experience as an essential individualized instructional technique for an agricultural mechanics course of study. Verbal symbols, demonstrations, visual symbols, contrived experiences and programmed instruction were considered very important individualized instructional techniques. Agricultural mechanics instructors and agricultural mechanics employees perceived still pictures, field trips, and motion pictures important individualized instructional techniques. Television and tape recorders were perceived as having little importance by agricultural mechanics instructors and agricultural mechanics employees as individualized instructional techniques for agricultural mechanics courses of study.

The results of the study indicated that agricultural mechanics instructors and company service schools utilized individualized instructional techniques in laboratory assignments but were using more conventional methods in the classroom presentation of materials. Assuming agricultural mechanics instructors were familiar with only the individualized instructional techniques they had used, it appeared that few individualized instructional materials had been developed in the areas of still pictures, motion pictures, television, and tape recorders for agricultural mechanics courses of study.

It was recommended that further studies be made of companies producing individualized instructional materials to see if there is

a gap between what instructors use and what is available. It was further recommended that studies be made to see if individualized instructional materials are being developed by agricultural mechanics instructors and agricultural machinery companies, and if so, are they adapted for use in other programs of study.

The results of this study appeared to have implications for teacher education and for curriculum planning and teaching methods used in agricultural mechanics courses of study. As few individualized instructional materials appeared to be developed for classroom utilization, the instructor in an agricultural mechanics course of study should be prepared to develop his own individualized instructional materials.