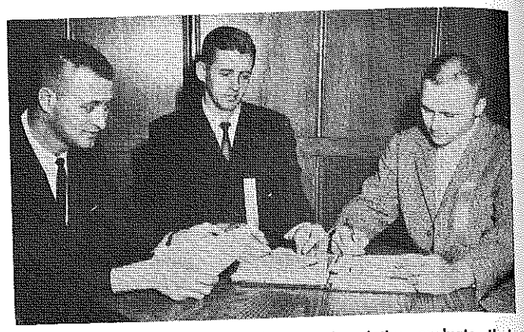
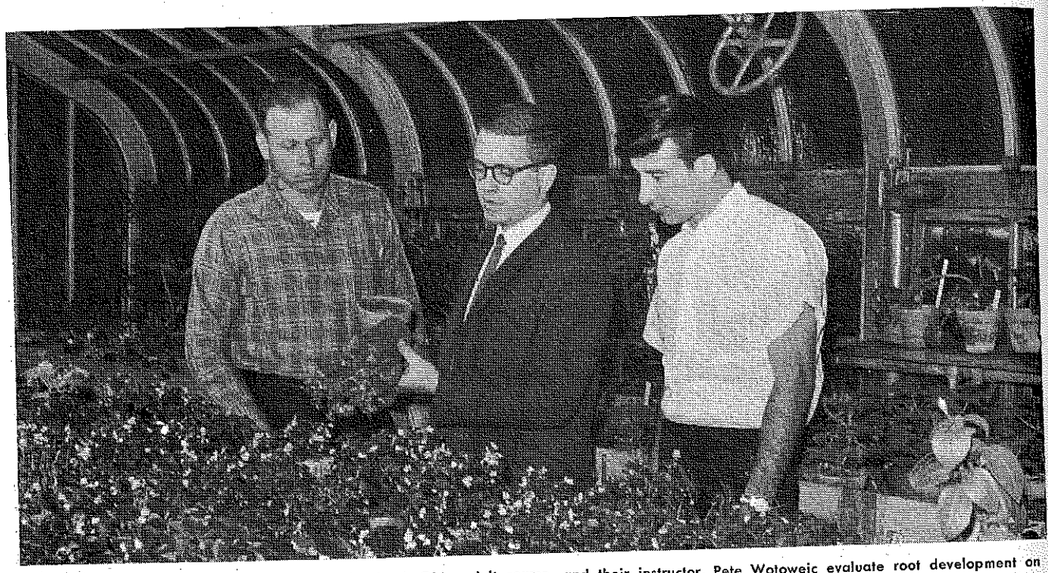
Stories in Pictures

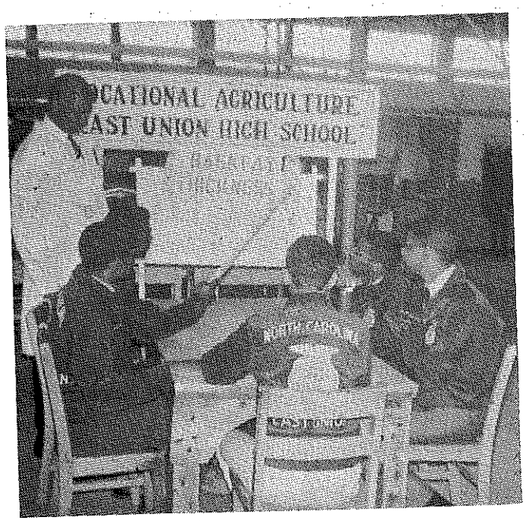
Gilbert S. Guiler
Ohio State University



Officers of Montana Voc. Agr. Teachers Association evaluate their State program. Photo—Ashcraft



Richard Dreger, Pane Good, members of a Cleveland, Ohio adult course, and their instructor, Pete Wotoweic evaluate root development on potted Begonia plants.



There is evidence of evaluation being done in selecting Ohio Young Farmer's wife year. Four area winners have accepted their awards at the annual Young Farmer Photo—

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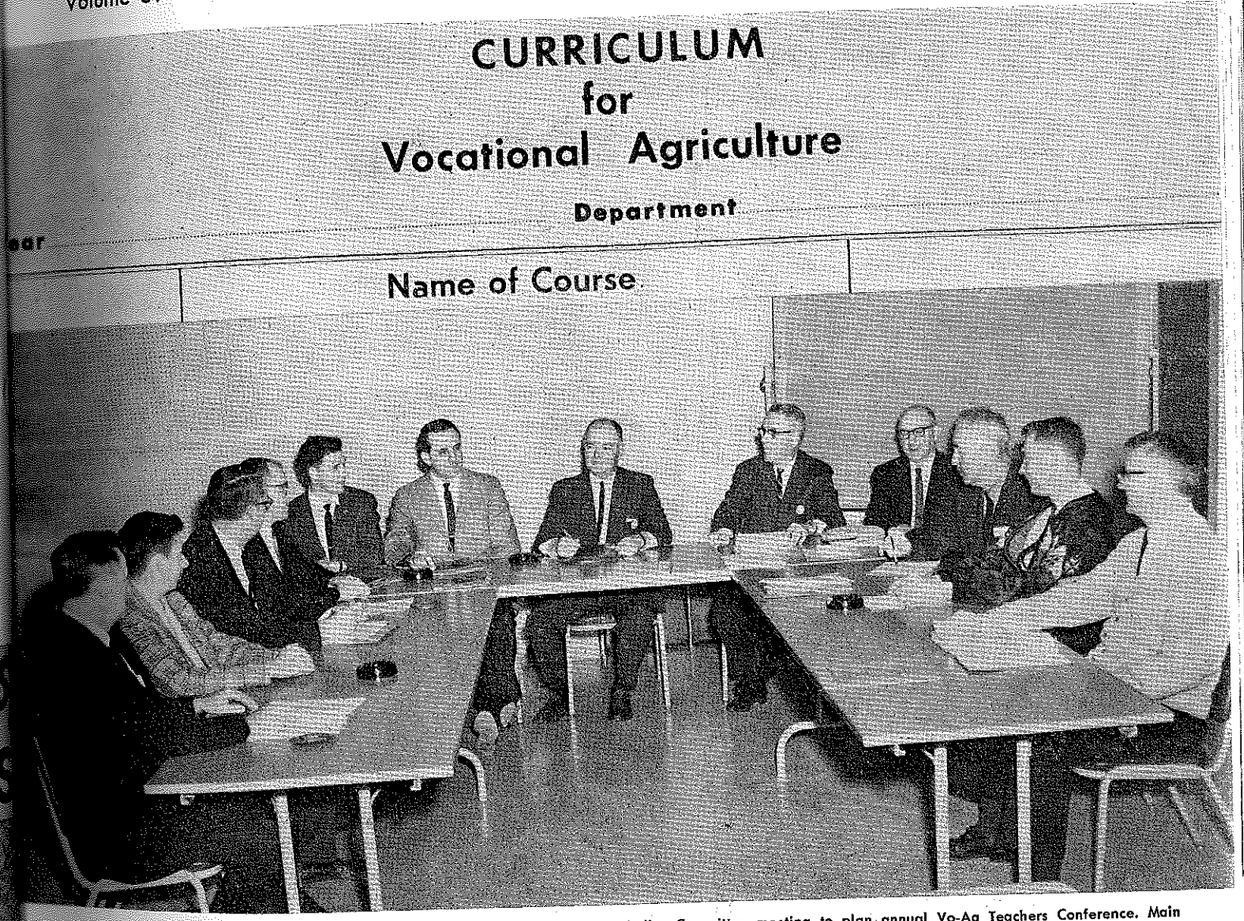
Agricultural . . . . . Education

CURRICULUM for Vocational Agriculture Department



West Virginia Vocational Agriculture Teachers Association Program and Policy Committee meeting to plan annual Vo-Ag Teachers Conference. Main emphasis to be "Implementing Training for Off-Farm Agricultural Occupations as an Important Phase of the Curriculum.

Featuring

CURRICULUM CHANGES

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The AGricultural EDucation Magazine

Volume 39 July, 1966 Number 1

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Editorials

Wanted: A Theory of Curriculum Development

Revising the curriculum for vocational agriculture in the high school is a popular activity. Sometimes the leader in suggesting revisions adds that there is considerable urgency in making the changes that he is suggesting. As indicated in an article in this issue of the magazine, Ray Agan feels that we have finally passed the *crossroad* and that we are now going pell mell down the broad highway to somewhere. Harold Binkley suggests some guidelines for developing some of the new programs. Richard Baker develops an interesting set of propositions for teaching in the world of work. Other articles in this and other issues of the magazine are telling us how new programs are being developed in vocational agriculture throughout the country. Some of these programs have an evaluative plan built into the program, either as a pilot program, or some other manner so that valid conclusions can be drawn from these programs and implications seen for similar programs elsewhere. It would seem that these efforts are highly desirable and we as a profession are indebted to the leaders in these ideas and programs.

One major, basic factor in curriculum development seems to be missing in most of the programs that I have seen and heard explained. This is a statement of the underlying theory for developing the curriculum. Sometimes even a statement of educational objectives is not seen nor apparent. I am not suggesting that before any curriculum is developed that we must have a complex, theoretical statement of theory and philosophy of curriculum. Just the opposite. It is facing up to the continuing question: "What should be taught?" Of course, this is not a simple question. It deserves more attention than some of our curriculum developers give it. A few of the major areas to be examined in trying to answer the question of "What should be taught?" will be examined briefly. To keep the discussion within reasonable bounds, we will start with vocational agriculture rather than the entire high school program.

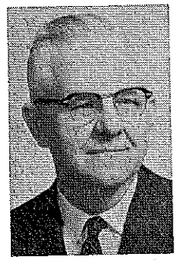
It seems clear that any curriculum in any vocational program should have a rather clear-cut relationship to occupational education for those enrolled in the program. So, one of the first areas to be examined is the contribution to occupational education that is to be expected from the curriculum being planned. This can be studied from the question of content as well as behavior changes expected of those enrolled. Ralph Tyler's two-dimensional approach to curriculum development is a valuable theory underlying this phase of curriculum development. Howard Martin, University of Connecticut, has made effective use of Tyler's theory in working with teachers in Connecticut on curriculum improvement.

Another basic area to consider in curriculum development in vocational agriculture as well as any other program, is the most effective grade placement or time to teach a particular course. Our best guide in vocational education seems to be the vocational development and vocational maturity of the persons to be enrolled. There is enough research to support these theories to follow them in our curriculum development. For example, we must see vocational education as more than "specific training for a specific job." There are many other strictly vocational as well as related educational needs for vocational development in addition to specific training for a specific job in DOT.

So, I am suggesting that we in Agricultural Education should know that there are basic theories underlying curriculum development in the high school, including vocational agriculture. Furthermore, we should recognize and use these theories as we are developing a curriculum. It has been amazing and discouraging to see how quickly some of us have become curriculum experts, rapidly turning out programs and units (modules) for distribution to be used widely. Such a curriculum is not likely to serve the best learning for those students in vocational agriculture in the high schools of our nation.

Perhaps the curriculum developers at the state and national level should be reminded that this is a big job to be shared by all concerned and that the *real curriculum* is what takes place in the classroom from day to day. Our dreams and plans for a better curriculum can be realized only through the teacher and his teaching in his situation.

Cayce Scarborough



Cayce Scarborough

Theory And Practice

My former major professor, Dr. H. M. Hamlin, clarifies the issue of "modules" in a letter received just in time for this month's magazine featuring curriculum. My major question has been whether this term will help improve our planning for effective teaching. I had just as soon use "module" as resource unit or any other appropriate term. I noticed in a recent British Journal that they are using the term in their new program of skill training as a "Training Module", indicating time needed to learn certain skills; also an "Experience Module" indicates the type and amount of experience needed to develop the desired skill. Then, they speak of Training Module for Skill C and Experience Module(s) for Skill C. Any questions?

Speaking of making use of new terms, another old one but not used much in the past in Agricultural Education is DOT—the *Dictionary of Occupational Titles.* New terms find their way in this dictionary the same as in any other dictionary—through use. *Agricultural Engineering Technician* is a new one, while *Wagonsmith* was deleted in the latest edition. Sign of the times?

Another interesting change is that the relationship between occupation and specific industry is diminishing. For example, workers who are turning out parts for automobiles may also be making parts for soda fountain equipment. So, in spite of specialization in some areas, technology cuts across other specialized areas.

Why does the adult advisor of FFA—local, state, national—do his advising with such a heavy hand? I believe that these local, state, and national FFA officers are fully capable of assuming more leadership responsibilities with less direction than we sometimes give. Reminds me of the coach who said, "Remember, boys, football develops leadership, initiative and individuality. Now get out there and do exactly as I told you."

(Continued, page 4)

Theory and Practice

(Continued from page 3)

Did you think that Ford Motor Company was in the automobile business? Nope, Ford makes refrigerators and lots of other things. But that's not their business either. Maybe you saw the full-page ad where they declare, "You see, the real business of Ford is *new ideas* —that's our driving ambition".

By the way, what is *our* driving ambition?

How do you like the thumbnail summary at the beginning of an article? Let me know so that I can continue to do this if you like it, or save the time and space if you don't.

Thank you for sending in your articles nicely typed and about ready for the press. Sorry that we cannot use every article sent it. Your understanding is appreciated.

Cayce Scarborough

Letter to Editor

Dear Cayce:

This letter is in response to your challenge to the teachers to tell you what they want from their professional magazine. Here are my comments:

What I Expect from my Professional Magazine.

1. First I want a report of what is happening in my profession. Who is retiring, who is stepping up, what new policies are being adopted etc. (Nationally and within the top state positions.)
2. I believe in the future of agricultural education but I still expect some communications for the importance of Vo-Ag. I would like to feel more "Espre de 'Corps" after reading the Agricultural Education Magazine. (Perhaps more success stories on how men have been honored for their dedicated work by their communities and states.)
3. I expect the professional magazine to challenge me to do a better job. To help show me my responsibility to study, learn, grow, and improve.
4. I expect my professional magazine to give me helps, ideas, suggestions, or successfully used teaching tricks on how to teach a specific topic.
5. The magazine should, in my opinion, be a place to share ideas, report research and disagree with others on ideas or trends.
6. I expect my magazine to be readable and interesting.

To all of us the "Agricultural Education Magazine" has met these expectations to a varying degree. The other side of the coin is that I expect the Vo-Ag teachers to be professional enough to read the magazine, write articles for it, use it to help him the way it can.

Thanks for a fine job as editor.

Sincerely yours,
Jim Hamilton
Audubon Community High School
Audubon, Iowa

Good to hear from you again, Jim. Here is the $1 for the best letter this month. CCS

(Continued on page 11)

GUEST EDITORIAL—

Values in Vocational Agriculture

FROM THIS STUDENT'S POINT OF VIEW

DENNIS H. WOOD, Graduate Student, University of Maryland

What is agricultural education about from a student's point of view? Reflections from graduate school frame up some questions and add some personal answers.

Agriculture teachers accomplish many things that are physically evident: Huge supervised farming programs; capable parliamentarians; machinery trailers; talent shows. Wisdom and effort ought to also be directed toward less evident accomplishments. Agricultural education should help the student build a sense of values that sharpens personal actions. It should add to a student's vision of what ought to be done in the community around him and offer valuable preparation for beginning to learn.

Building Individuality in the Realm of Values

Agricultural education should urge students to discover their own values, and allow them to develop their own personal hierarchy of norms. This calls for treating students as individuals, allowing them to discover and develop their potential areas of interest apart from teacher values and F.F.A. structure and goals.

Most programs of agricultural instruction are too systematized. Systems are the antithesis of life, and hem students in when their vision, values and capacity tell them there are better things beyond the imposed "guidelines." To drastically paraphrase a noted historian, a teacher's tendency toward oppression can be checked only if the students have the capacity to resist. Students, we should hope, will always have capacity to resist any finished system of thinking, action and norms that is imposed upon them. From this student's point of view, the concept of willingness to change and the ability to see the need for it is most of what agricultural education should be about.

This kind of discussion prompts two questions for agricultural educators: 1) What are you doing, in your near ideal environment, to offset our society's de-personalization of persons?; 2) Are you combining love and service for fellow man and rational social thought in your agricultural education program? Answers spear you daily, challenging your creativity anew.

Developing Responsible Action

Linked to a sense of values is everyone's concept of what should be put into life. Education in agriculture means a keener understanding of people, leadership and society; also more refined skills in many areas. These help us toward more fruitful action, but are always directed by the examples we have seen, the way we have been trained (or educated), and the values we have accepted. Too often education in agriculture has not greatly increased a student's vision of what actions he can take for the benefit of himself and others. A never ceasing task, the search for ways to inspire students to seek to serve his fellow man is one of the acute responsibilities of agricultural educators.

For Better Future Learning

Education in agriculture provides a foundation for beginning to learn. This emphasizes the need for a flexible education that constructs understandings and relationships that will wear well in our complex society. Most crucial is the development of ability to meet and think through new situations and to make difficult decisions in the face of uncertainty. Present situations shall pass away, and students will face a new environment and unique challenges. A part of your task today is to be sure that your students can "go it alone" tomorrow, something that calls for letting them practice it by themselves today.

The development of this foundation for learning needs further thought from agriculture teachers. Future learning depends upon a discriminating mind much more than upon a crudely defined skill. Soldering or rope braiding practice does not prepare students for the agonizing fire of life where clusters of plausible alternatives are constantly thrown up for an intelligent decision. In effect, agricultural education must weld education and training into a flexible unit that will sustain an individual throughout the next several decades.

By now some of you are saying, "But those concepts are a part of my agricultural education program today," and truthfully so. Normally they do not reign from their rightful throne however, and lackluster statements that they do will not change the tarnished gold of the banner.

What And How To Teach— A Continuing Problem

RAYMOND AGAN, Teacher Education, Kansas State University

In this talk made at a regional conference, the question of how to teach in order to reach stated objectives is examined. Shall we abandon "learning to do by doing" because of rapid changes in agriculture and people? Developing concepts may be the key, suggests the author.

Raymond Agan

For a period of time which seemed like several years, we in vocational agriculture were asking ourselves the question—"*Is* vocational agriculture at a cross-roads? Which way should we go?" Today we find ourselves rocketed down a multi-lane road with much more "traffic" away beyond the well-worn cross-road. The propellant for our rocketing is the Morris-Perkins law, the Vocational Act of 1963, which we now find ourselves attempting to control, and to implement to the best advantage. The question of "when" is past—we now search for a more complete answer to the question of "how".

Modern objectives for Vocational and Technical Education in Agriculture have been well outlined in an Office of Education Bulletin (OE—81011 Bulletin 1966, No. 4). The first three objectives deal with responsibilities dealing with the teaching of (1) "production agriculture", (2) "agricultural opportunities", and (3) "occupational experience programs". The other three of (1) placement (2) human relations and (3) leadership seem to blend somewhat into the first three if they are well-done, and fit well into the future farmer part of the program of vocational agriculture.

Methods—The Question of How

Thus, the question of "how" continues to grow as we worry about how to adequately teach just one objective as outlined above, in the time we have. The technical knowledge of the production phase of agriculture would in itself be a challenge. Education must step-up its process of teaching if it is to keep step with society. This acceleration of social change is followed with the phenomena of enlargement of social organizations and mass processing of people.

As we study this situation we become acquainted with the word "cybernation" which refers to both the manipulation and fabrication of material objects by automation and to the manipulation of symbols by computers. Using the word "cybernation" saves continually repeating "automation and computers" and it eliminates the sense of rigid mechanization that tends to be semantically associated with the word automation. Cybernation is illustrated by Bell Telephone Company who now handles 50 per cent more calls with ten per cent less people than a few years ago, or the Bureau of Census who had 50 employees on a position in 1960 that required 4100 employees just ten years before, or the farmer who now produces food for himself and 31 others compared to himself and 15 others in 1949.

Another change we face as we attempt to educate is the moving population where every year one American in five changes his address and one person in four now lives in a state other than the one in which he was born. As teachers of vocational agriculture we have the problem of preparing agricultural experts in this phenomenon of accelerated social change and the phenomena of large organizations and mass processing of people.

All of this indicates that improved methods must be found—methods become more and more important in their relationship to the subject matter. The question of "how" gets louder and louder.

Solving the Problem of How

The number one fact to consider in approaching the solution of this problem seems to be that we are working in a situation where the future in subject matter and the future in agricultural opportunities are rapidly growing and largely unknown. The number two fact to consider is that the educated person is the one who is able to solve life's problems well and continually strives to keep abreast of newly found information—intellectual curiosity we might call it. Thirdly, it is more and more important that the educated person has the ability to understand and get along well with the peoples of the

(Continued on page 23)

Teaching Systems versus Projects

H. H. GOLDEN, Vo Ag Teacher, A. G. Richardson High School, Louisa, Virginia

In vocational classes, the project done by a student should no longer be considered the criterion for complete evaluation of progress in a vocational education class. However, there are many skills and understandings that can be derived from project construction, if they are taught. Problem-solving, motivation to research, the ability to see relationships and how to apply knowledge to new situations must receive increasing emphasis in the instructional pattern.

Why Teach This?

Projects that ignore the opportunities for developing these skills and understandings can only be called enrichment or things "nice to know." We need to gear our instructional programs in vocational education to information that the students "*need* to know." Accept the fact during our rapid and industrial age, the world of knowledge is very broad, sometimes we feel too broad; therefore, every vocational teacher should be challenged to plan and teach only that subject matter or engage in only those projects that will increase educational horizons of our greatest legacy in the classroom, our students. Then, all of us will not be guilty of our instruction being outdated because of our failure or unwillingness to revise the technical format of instruction to meet the challenge of our highly accelerated industrial and technical age.

We, in vocational education must use the authentic laboratory approach to accomplish our goals. We must truly begin to use the "Scientific Approach," beginning with a statement of the problem, list desired goals or objectives, survey for materials needed, list the steps involved, then evaluate the project or lesson in light of the objectives set. Very often it is necessary to repeat the exercise or performance if the goals have not been met.

Because of the influx of new knowledge in our field, we need more time to do the job required. Because most school administrators have a tight schedule, granting more time is almost unthought of. The time that is alloted for vocational education instruction is inversely proportional to the explosion of new knowledge and industrial and technical progress. Therefore, we must be extremely definite about what needs to be taught and very procedural about teaching it. Our time must be used wisely. We cannot afford to do less.

Curriculum for the World of Work

RICHARD BAKER, Teacher Education, Auburn University, Alabama

Theory and practice in curriculum and teaching are illustrated for programs in the world of work. Some specific propositions are examined. It is suggested that the big problem is to keep curriculum and teaching in tune with the rapidly changing needs.

Richard A. Baker

It is generally agreed that a positive attitude and approach in program planning is necessary if the high school program of vocational agriculture is to keep pace with the needs of our time. In spite of the progress during the past few years to update vocational agriculture curricula at the high school level, many schools are still out of pace with the changing occupational and socio-economic structures of their respective communities.

It is also a recognized fact that the job opportunities for people with an agricultural education, and in some cases with simply a farm background, continue to increase. A vast number of these jobs in agricultural businesses and industries do not need to be filled with persons with baccalaureate degrees.

The Vocational Education Act of 1963 amended the previous vocational education acts to permit vocational agriculture to include educational programs involving the knowledge and skills needed by persons engaged in off-farm agricultural occupations. In no way was this amending intended to minimize the importance of developing the skills needed by persons engaged in production agriculture. Adjusting old, and designing new curricula in vocational agriculture is inevitable if the program is to be effective and is to deal efficiently with the dual functions of providing vocational education for both on-farm and off-farm agricultural occupations.

Obviously, there are a number of curricula approaches that educators in vocational agriculture could use in planning local instructional programs. Several approaches are under consideration in many of the States and in some cases are already in operation.

The most common curricula approaches consist of (1) *basic courses* in agriculture with an instructional orientation toward the production of crops and livestock, and (2) *multiple-track courses* involving common skills and abilities needed for clusters of agricultural occupations.

Production Oriented Curriculum

Some educators in vocational agriculture believe that the best basic education for off-farm agricultural occupations is to do the best job possible in preparing students for production agriculture. This production centered approach may well be the foundation needed for success in off-farm agricultural occupations. There is a danger in educational practice, however, that both the teacher and his students will associate production learning experiences with only the production occupational category, and will not consider them in terms of competencies needed by the other occupational categories in agriculture. Learning experiences should be organized to form a coherent educational program. Changes in ways of thinking, in fundamental habits, in concepts, in attitudes, and in interests develop slowly unless experiences are organized into units, courses, and programs to satisfy educational objectives.

There is nothing wrong in admitting that many off-farm agricultural occupations require some of the same skills and abilities needed in production agriculture. In fact, research conducted relative to competencies needed by persons engaged in off-farm agricultural occupations have pointed out these similarities.

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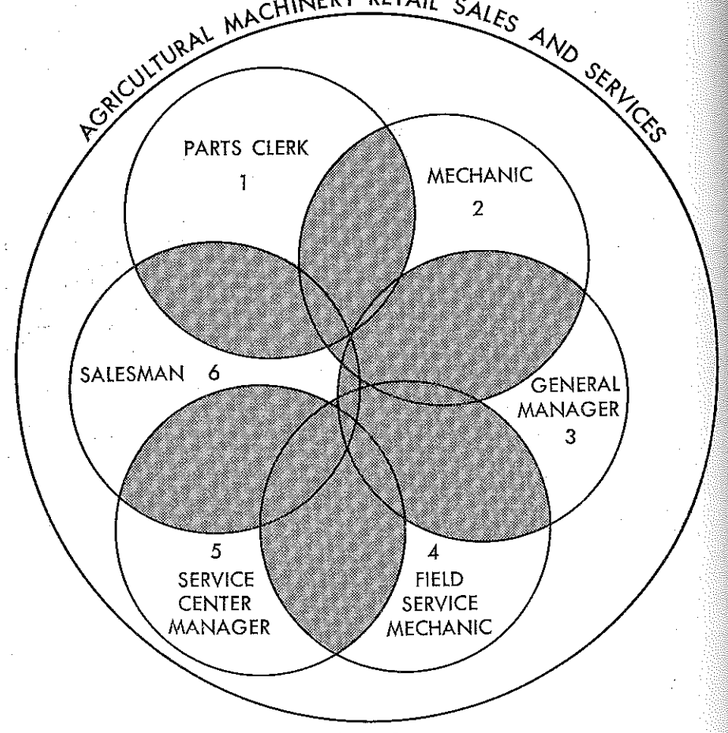

Figure 1

Related skills and abilities for the high school program

Highly specialized skills and technical abilities for post-school programs and/or on-the-job training

Richard A. Baker

(Continued from page 6)

These same studies, however, have also provided evidence that persons engaged in occupations in off-farm agricultural businesses and industries need several kinds of vocational education. Some need, in addition to the competencies in technical agriculture, competencies in the distribution of supplies and services, while others need competencies in the trades and office practice.

There are probably a few schools in every state that can justify a completely production centered curriculum. All others should consider adjusting their curricula to include education for off-farm agricultural occupations. Those schools that fail to make the needed adjustments are implying, by their educational practice and their program objectives, that farming and agriculture are synonymous terms.

Common Elements Curriculum

Some vocational agriculture teachers are attempting to modernize by designing their programs to involve skills and abilities needed for clusters of agricultural occupations. The basis for this modernization is the degree of similarity among agricultural occupations—similarity in knowledge and abilities that are common to workers in these occupations, and that are required by them in the performance of their duties.

The first phase of the common elements curriculum usually consists of one or two pre-vocational courses, with emphasis on the basic biological, physical, and social sciences associated with occupations in agricultural businesses. As students enter the advanced phase, vocational common elements courses are provided for an occupational category or for several occupational categories.

For instance, a multiple-teacher department could elect to provide the basic education required for persons employed in an agricultural machinery retail sales and services business, an agricultural supply retail sales business, or an ornamental horticultural production sales and services business. One of the primary tasks in program planning would be to determine, either through an employer inquiry or through an observation technique, what skills and abilities are needed by the various occupations in that type of business. Then, through selection, to include in the classroom and laboratory instruction those skills and abilities related or common to all of the occupations (shaded area, Figure 1). The remainder (non-shaded) of the basic skills and abilities could be developed through occupational experience programs. Since high school vocational agriculture is not designed to offer terminal education for any agricultural occupation, the highly specialized skills and technical abilities must be left for post-high school programs and on-the-job training. This type of program could be offered under one or several multiple-track curricular options (Figure 2).

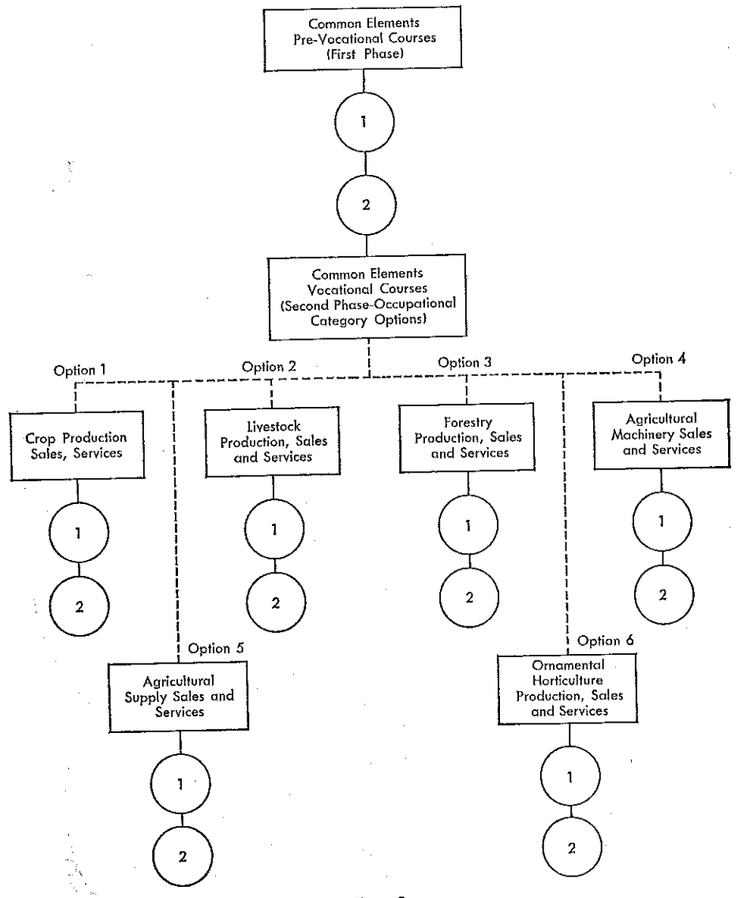

Figure 2

The small rural high school with its limited faculty has always been confronted with the problem of providing adequate educational experiences to meet the needs of its students. So it will be with the single-teacher departments of vocational agriculture in the future. A number of problems are being encountered by teachers in single-teacher departments who are trying to design comprehensive and diversified programs for agricultural occupations. Some of the major problems are scheduling, inadequate facilities, lack of specialized teacher competencies, inadequate occupational experience centers and insufficient employment opportunities.

An analysis of research studies conducted by states during the past two years reveals several hundred non-professional occupations in eight major fields of agriculture. Obviously, the high school program of vocational agriculture can do very little in providing specialized instruction for such a large number of occupations, or even for clusters of these occupations. Therefore, teachers in single-teacher departments should also attempt to adjust their programs by applying the common elements approach. The planning process is an expansion of what has been described for multiple-teacher departments. The teacher in a multiple-teacher department, interested in providing instruction for one economic activity (Option 4, Figure 2), is concerned only with the occupations within that occupational category (Figure 1). The teacher in the single-teacher department, recognizing that occupations within categories are related, extends the

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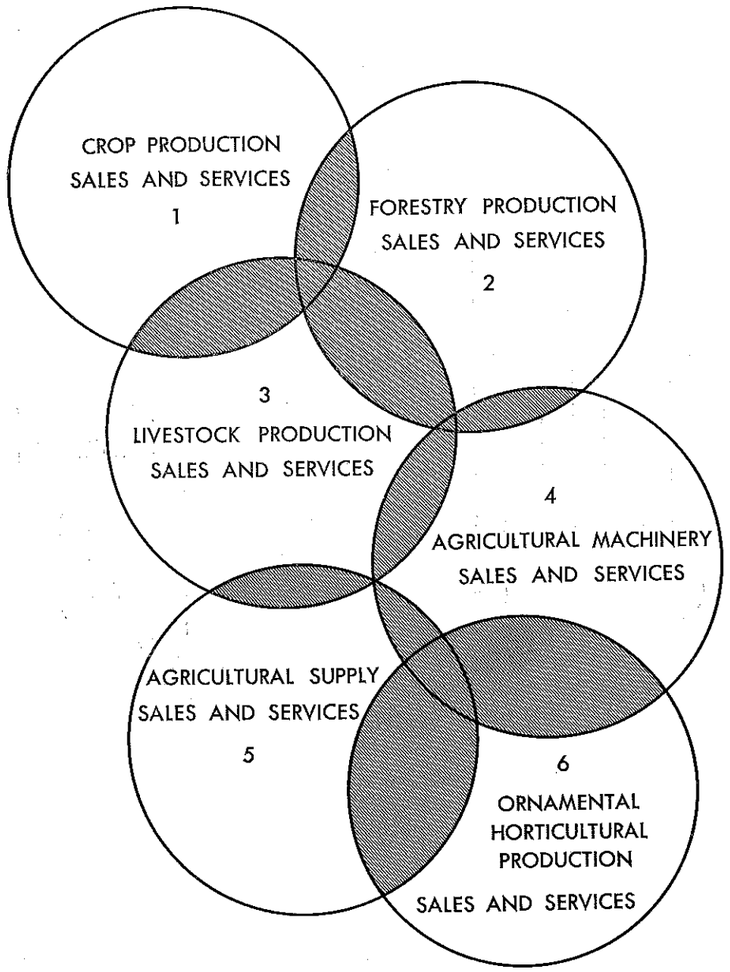

Figure 3

Related skills and abilities for the high school program

Highly specialized skills and technical abilities for post-school programs and/or on-the-job training

Richard A. Baker

(Continued from page 7)

relatedness to the economic activities in the agri-business complex. Then, through selection, includes in his curriculum those skills and abilities related or common to occupations, occupational categories and economic activities (overlapping, Figure 3 above), and offers them through pre-vocational courses (Figure 4) and vocational courses (Figure 4, Option 1, next page).

Of course, teachers should not attempt to restrict curricular offerings to departmental staff organization. It is quite conceivable that in a multiple-teacher department organization, Option 1 (Figure 4) would be included as an option in multiple-track option structures (Figure 2). It is also conceivable that some multiple-teacher departments would offer only this option. This would be especially true if employment opportunities and occupational experience centers were limited or equally distributed among a number of the economic activities (Figure 3) in the agribusiness complex.

It may be possible in certain schools for single-teacher departments to offer two optional tracks (Figure 4), especially, if there is no difficulty with scheduling students, and there are employment opportunities and experience centers available for any one of the economic activities.

Curriculum and Teaching

It can be seen from the foregoing discussion that organizing a common elements curriculum will involve not only a great deal of pre-planning, but also planning during the educative process. Curriculum construction and improvement of instruction are elements in the same series. Changing the curriculum from the production oriented approach to the common elements approach does not of itself improve teaching.

There are many process-related problems associated with curriculum and teaching. No attempt will be made here to present an exhaustive list of these problems. But, an attempt will be made to reveal, rather indirectly, some of the larger problem areas, and to suggest ways of approaching them by isolating some related propositions that may have a bearing upon the implementation of a common elements instructional program.

Related Propositions

Proposition 1: Job aspirations, interest and experiences are not necessarily assessments of job qualifications or job opportunities.

Proposition 2: Vocational agriculture programs should not necessarily be judged on the basis of the number of students who enter agriculture, but rather on the basis of the services which the programs render to the students in the form of educational experiences suitable for occupations.

Proposition 3: While the mental ability of the early age adolescent can be appraised for estimating the appropriate amount and level of vocational education optimum for developing his competencies, most early age adolescents are neither "ready" nor prepared to decide on a future occupation.

Proposition 4: The fundamental function of all education is to equip students with the ability to engage, throughout their lives, in continuing education. No agricultural worker can expect the knowledge and skills learned during youth to be sufficient all through their lifetime. An understanding and an acceptance of this fact, and an education which prepares the individual for continuing occupational growth and with a willingness to acquire new skills, is the best vocational education that can be provided in the high school.

(Continued on next page)

Richard A. Baker

(Continued from page 8)

Proposition 5: Pre-vocational courses designed to develop new interests and to further define the existing interest of students should be offered in high schools. These courses should assist students in discovering and understanding their capabilities and limitations and also in acquiring some occupational insights into the world of work.

Proposition 6: Effective teaching in vocational education depends primarily upon observations, fact acquisition and actual participation in work experiences on the part of the student.

Proposition 7: Teaching "about" and "for" agricultural occupations are entirely two different aspects of instruction. Teaching "about" occupations falls under the realm of occupational guidance, while teaching "for" occupations deals with occupational competencies. Because they are two different aspects does not necessarily mean that they must be handled separately in the classroom. Occupational information should be integrated with subject matter during a production-distribution teaching approach. This approach should parallel occupational categories and selected occupations with the various phases of the enterprise from the breeding of the plant or animal to the consumption of the product.

Proposition 8: A vocational agriculture program which combines actual occupational experience with related school instruction can capture additional values for the student and can facilitate his transfer from student life to occupational life. Achieving the potential values of work experience education depends upon a number of related variables. A plan for program coordination, wherein the school and business cooperators work together in planning a program that is related, flexible and dynamic, is of primary importance.

Postscript

There are many guidelines to be considered by the teacher in his continuous effort to improve his instructional program. The questions associated with curriculum and teaching are not ones to which the teacher should attempt to give final answers. In fact, there are few, if any, ultimate principles for any given instructional program. The broad problem is one of keeping the instructional program attuned to the rapid social and technological changes. It is proving to be exceedingly difficult to do so, but nothing is more important.

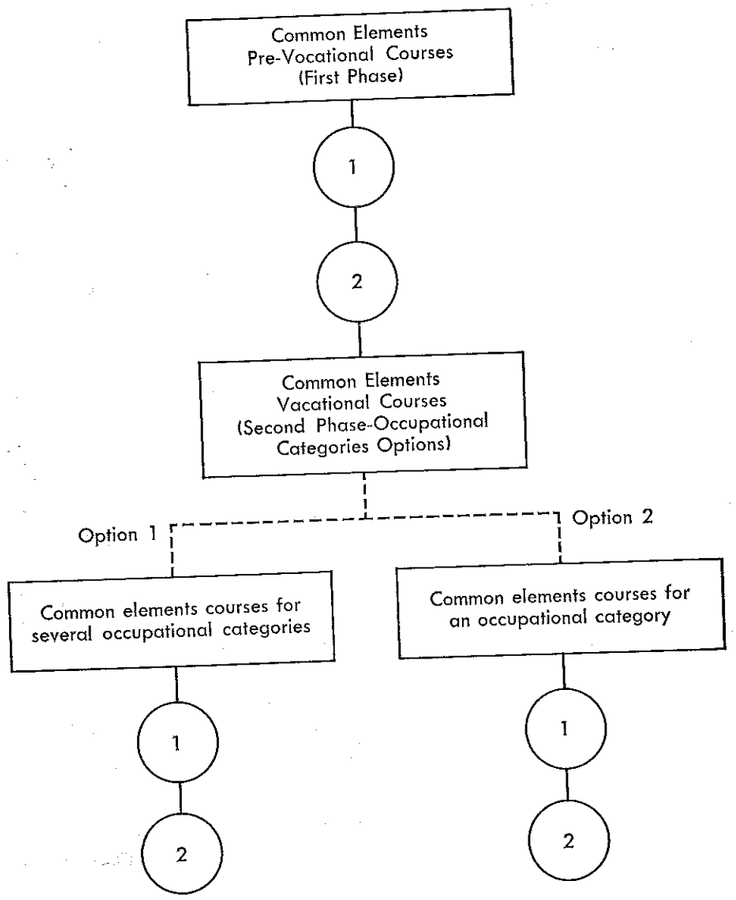

Figure 4

Themes For The Agricultural Education Magazine

October-December, 1966

October—

IS ADULT EDUCATION GETTING LOST IN THE SHUFFLE?

Are we still in the business of adult and young farmer education? Is time alloted for this purpose? Full-time teachers of adults get results—reports of success stories. Adult education in agriculture for other groups as well as farmers—agri-business, industry, urban groups.

November—

OUR CHANGING ROLE

Are we in Vocational Agriculture, Agricultural Education, Vocational Education, or Occupational Education? Educational leaders or agricultural specialists? Examine the changing role of the teacher, the supervisor, and the teacher educator.

December—

COLLEGE PROGRAMS FOR PROSPECTIVE TEACHERS

Do we have a Model T or 1967 Model Program? What are the major objectives of the undergraduate program? Are these objectives consistent with the demands placed upon the beginning teacher? What responsibility do we have for the student going into other agricultural education positions?

Base Occupational Courses on Job Analysis

CHARLES C. DRAWBAUGH, Teacher Education, Rutgers University

Making a job analysis is not making a course of study, the writer says, but is an essential first step. Here he gives specific suggestions for doing the job, including the place of skills in the teaching program. Should "analysis of the student" be included with job analysis?

Charles Drawbaugh

A few years ago vocational agriculture courses in high schools were aimed specifically toward establishing boys in the business of farming. Most teachers of agriculture came from farms, were themselves former Future Farmers, and were graduates of the state university with a degree in agricultural education. The teacher of agriculture not only knew vocational agriculture; he experienced it, was a part of it, and lived it. And, possibly equally as important to the success of the program, he inherited a tested and updated course of study from a previous generation of vocational agricultural leaders who enjoyed the same experiences. The course of study was assumed valid primarily because the teachers who were also the course builders came via the same road they were advising their students to travel.

An Expanded Program

The Vocational Education Act of 1963 provided for the broadening of vocational education in agriculture. Educators are no longer intimately familiar with all the occupations they are charged to teach. Preparing a course of study for off-farm agricultural occupations is much more complicated than preparing one for traditional vocational agriculture. Newly inherited occupations must be analyzed before one is secure in writing course materials for them.

The Vocational Education Act of 1963 stimulated state research studies to provide data on employment opportunities and training needs essential to intelligently plan vocational education programs for off-farm agricultural occupations. Stevens (6) summarized the findings of the state research studies which were classified as "predominantly interview-type surveys of employment needs in off-farm agricultural businesses." He notes that research in this area is just beginning to provide direction to curriculum planning.

The state studies accelerated the production of teaching materials for off-farm agricultural occupations training. The data, which emphasized "employment needs" rather than "employee tasks", apparently did little to change the procedure for developing occupational training materials. Off-farm agricultural occupations must be thoroughly analyzed to learn tasks which, in turn, shed light on the kinds of skills and knowledges to be written into the course of study.

Ways of Obtaining Occupational Information

Of the several means of obtaining occupational training information, job analysis is one of the best known. The armed forces and business and industry have successfully used job analysis to obtain occupational training information. When complete job analysis data are utilized to write a training course, the course is aimed at occupational training objectives rather than toward the traditional core of subject matter. More precisely, the course is written for training students to become "horticultural salespersons" or "nurserymen" rather than about "ornamental horticulture." Presently this is seldom the case. The future approach to curriculum building in this broadened area of vocational agriculture calls for discovery or rediscovery of job analysis which will lead to occupationally oriented course objectives and programs.

What is Job Analysis?

Job analysis (3) is the process of identifying by observation, interview, and study the technical and environmental facts of a specific job and of reporting the significant worker activities and requirements. For curriculum development purposes job analysis can be defined simply as making a complete itemized list of the tasks a worker does and the things about which he knows relative to an occupation. It is an exhaustive list of the manipulative (doing) and cognitive (knowing) tasks a worker demonstrates in doing his work.

Taking a task statement inventory can be a rewarding experience for teachers of agriculture. The teacher who studies agri-business occupations is informed about the work that is done and the training that is needed. Analyzing a job helps the teacher become aware of the great amount of teachable content about the job. And, too, it helps the teacher understand and appreciate the methods of arranging materials for teaching purposes. When the teacher analyzes an occupation and writes the training materials, he has a foundation for teaching which has meaning.

Prior to doing a job analysis the teacher should become acquainted with the *Dictionary of Occupational Titles* and job analysis publications such as those by Frutcher (1), Fryklund (2), and Petersen (4) to familiarize himself with analysis procedure and usefulness. Next he should tour the agricultural business to become familiar with the overall operations and to determine the relationship of the job to be analyzed to the entire process. Now the teacher is ready to observe the worker and inventory the tasks through a complete cycle of work. When finished, he should verify the completed analysis with the immediate supervisor of the worker. The task inventory should be repeated at several business places to insure a degree of reliability of the accumulated list of tasks. When this procedure is followed, the teacher will have an abundance of data useful for curriculum development.

In listing the tasks that comprise a job the analyst should arrange them in either a chronological or functional order. The list on the following page is an example of part of a categorized task statement inventory for horticultural retail sales occupations.

Developing a Course of Study

From the list of tasks are developed families of skills and knowledges. Each family is a self-contained unit which can be inserted into a course of study. The course for Horticultural Retail Sales Occupations may include families of skills and knowledges in horticulture, supplies and chemicals, and mechanics on the agricultural side of the training course. The distributive education part of the course may have families in human relations, clerical-business, and merchandizing. The six families of skills and knowledges when brought together may well be the course used to prepare retail salespersons for employment in

(Continued on next page)

Horticultural Retail Sales Occupations

	Kind of Task
I Agricultural Tasks	
1. Horticulture	
a. Waters plants	Doing
b. Names plant characteristics	Knowing
2. Supplies and Chemicals	
a. Recommends herbicides	Knowing
b. Explains fertilizer analyses	Knowing
3. Mechanics	
a. Assembles fertilizer spreaders	Doing
b. Demonstrates lawn mowers	Doing
II Sales Tasks	
1. Human Relations	
a. Recognizes customer needs	Knowing
b. Establishes coustomer rapport	Knowing
2. Clerical-Business	
a. Discounts cash sales	Doing
b. Operates cash register	Doing
3. Merchandizing	
a. Makes displays	Doing
b. Prices products	Doing

Charles Drawbaugh *(Continued from page 10)*

garden centers, roadside stands, produce markets, and floral shops.

Doing an analysis is not making a course of study. The analysis provides data on the tasks and other factors of the job. From the list of tasks is developed a list of skills required to do the tasks. The skills are grouped into families and categorized as easy or difficult for purposes of placing them in the course. Suitable projects and work assignments are incorporated into the course of study to prepare students to enter into an occupation with a reasonable degree of competence. In essence, job analysis is the basis for selecting teaching content which is expressed in terms of essential elements the learner must be able to do and know to get a job.

Phipps (5) found that for occupational training "the teaching must be systematic and carefully planned." He reports that "pupils in new courses in agriculture want to be taught in a systematic manner the technical agriculture they will need for gainful employment in occupations requiring knowledge and skills in agriculture."

Summary

Teachers of agriculture would do well to become thoroughly knowledgeable about certain of the off-farm agricultural occupations by carefully studying worker tasks. Selected skills and knowledge, and purposeful activities uncovered through job analysis and preceded by occupational training objectives can be written into a course of study by others. However, would the course not be more useful to the teacher and more meaningful to the student if the teacher did it? When a program in vocational agriculture is distinguished as outstanding, it is because the teacher of that program put forth a concerted effort in a direction he and others believed to be sound. The future in off-farm agricultural occupations is bright for those who accept the challenge. Now is the time for the teacher of agriculture to update himself in carefully chosen agricultural occupations, do job analysis research, write the necessary courses of study, and teach students for entry into and gainful employment in the world of work.

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LETTERS TO EDITOR

(Continued from page 4)

Dear Cayce:

I had hoped that someone else would rise to the defense of the term "*module*" about which you have been trying for months to stir a debate.

I came onto the staff of the Center for Vocational and Technical Education, Ohio State University, shortly after the decision had been made to use this term in some of the curriculum materials prepared at the Center. At first, I had the same misgivings as you, but I came quickly to see the advantages.

The distinction between a "module" and a "unit" as these terms are used in education is that a module may be a unit within any of several courses while a unit is an integral part of one course only. A module may be included in a course for twelfth-grade boys or a two-year curriculum in an area school, or it may be taught as a separate course for young or adult farmers. It may be a part of a course in agricultural business, or horticulture, or agricultural mechanics.

There are advantages in the preparation of materials that can be used in several courses. Whether they will be so used depends upon the teachers but a variety of uses is at least suggested.

"Module" is a term long used in carpentry, electricity, and hydraulics. Webster gives additional definitions different from those used in these three fields. As we are using it in education, it parallels most closely the use in carpentry, where a module is a self-contained unit which can be fitted into buildings or furniture of many types.

There are the same difficulties in the use of "module" that have been encountered when education has adopted other terms from outside its field. "Objective" does not have the same meaning for educators as for military men. "Measurement" is quite different in engineering than in education. "Project," widely used by others, has taken on a special meaning in agricultural education.

I do not smell heresy in the use of the new term. It has certain advantages if understood.

H. M. Hamlin

Thanks very much for continuing to try to teach me. I think that I understand the term, but it still seems to be the same as a Resource Unit—an interchangeable unit. See my note in Theory and Practice Column. —CCS

Dear Cayce:

I want to write to compliment you on the April issue of the *Agricultural Education Magazine,* featuring NVATA.

I realize that I have a biased opinion, but I felt that this was one of the most interesting issues of the magazine that I have ever seen.

It would certainly be unwise to devote every issue or even one issue a year to professional organizations, but I think it could be done periodically and serve as a benefit to both the organizations and the magazine.

Best wishes for continued success in your endeavors as editor of the *Agricultural Education Magazine.*

Sincerely,
Walter L. Bomeli
NVATA Past President, '63-'64
Bangor, Michigan 40913

Choice of Curriculum Made Possible

LARRY L. SLATER, Vo Ag Teacher, Waverly, Iowa

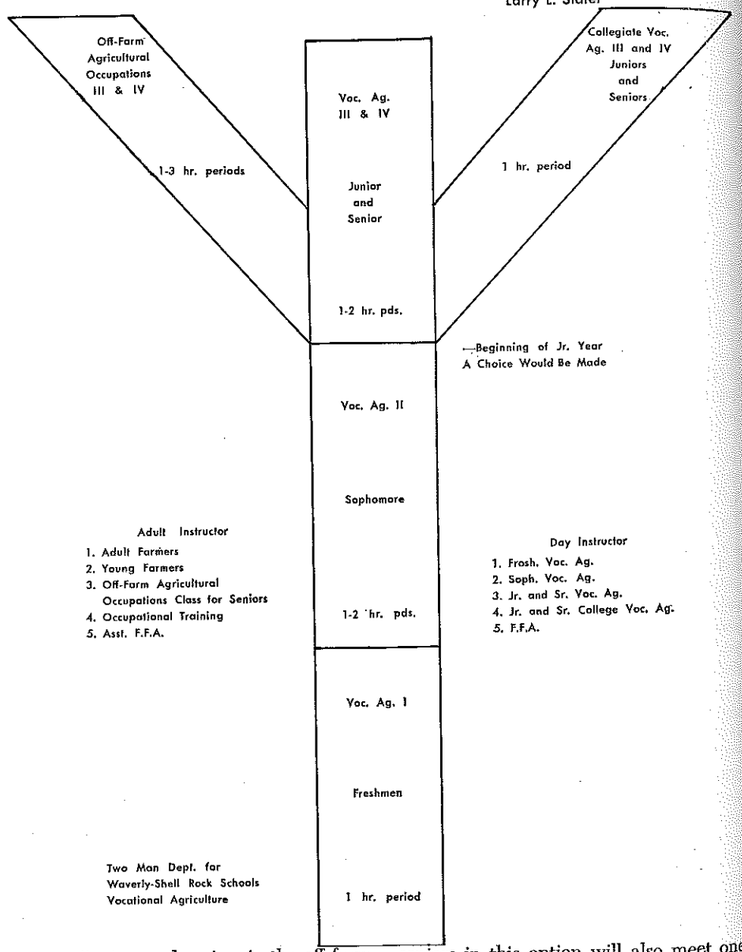
Here is a plan for giving students more choice than is usually available in the vocational agriculture program. Details of how the curriculum choice is made possible are given.

Larry L. Slater

For several years I have noted that vocational agriculture graduates had been dividing themselves nearly equal into three areas of vocational choice: farming, off-farm agriculturally related occupations and careers in technical agriculture with collegiate training, etc. There seemed to be a logical guideline in establishing a curriculum for the expanded vocational agriculture department, with three options being made available to each vocational agriculture student: (1) vocational agriculture and farming, (2) vocational agriculture and off-farm agriculturally related occupations, and (3) vocational agriculture in preparation for advanced technical education in agriculture.

How Program Operates

As to the operation of the vocational agriculture curriculum, freshman and sophomore vocational agriculture students are given basic background material and instruction in technical agriculture in the area of modern agriculture, with no exceptions being made to the requirement that each student must have a supervised practice program. However, some supervised practice program might be conducted in an off-farm situation. The vocational agriculture instructor continues to make supervisory visits to the student. During the sophomore year, in close cooperation with the vocational agriculture instructor and guidance counselor, the student would have the opportunity to make a choice as to the curriculum option he prefers. Of course, close contact is maintained with the parent at all times. Beginning the junior year, students will actually be meeting in classes of their special interest, juniors and seniors meeting together. As to the actual breakdown of the classes, credits received, periods met, and overall class patterns, please consult the diagram chart shown at the right. Perhaps the newest inclusion in this pilot program is the option of the off-farm agriculturally related occupations training. While students have been fitting into this area on their own very successfully for many years, as vocational agriculture graduates, it does appear advisable to, if possible, allow them to be grouped even more specifically by interest than what has been possible in present programs. Juniors and seniors in the off-farm agriculturally related occupations option meet together as a class for one period a day. Juniors will be encouraged to take a suggested series of one semester courses other than vocational agriculture to complement their vocational agriculture training, which at this time is in preparation for the occupation of their choice. Also, during the junior year some off-farm related vocational occupations choice exploration will be made in class on an individual basis. The seniors in this option will also meet one period per day for related instruction.



As the student becomes ready, the last two periods in the day they are placed in a business of their choice in the local community in the area of which they wish their training. Directly related agricultural businesses in the community are the only ones being used. In a community the size of Waverly, 6,500 population, this does involve quite a listing of businesses including cooperatives, farm

(Continued on page 13)

Teaching Meats in Ten Easy Lessons

RAYMOND J. AGAN, Teacher Education, Kansas State University
BOB SEVERANCE, NCK Vo-Tech School, Beloit, Kansas

Vo-Ag teachers who are not including meats instruction in their vocational agriculture curriculum are short-changing their boys as well as missing some genuine teaching pleasure. Many instructors have been rather gun-shy of this important segment of livestock education because they don't realize how easy and enjoyable a unit on meats can be.

A rather complete course in meats can be effectively presented in twenty classroom hours. This is designed to

Larry Slater *(Continued from page 12)*

supply centers, etc. Twelve training centers are being established and will be maintained with a very close degree of cooperation being expected between these businesses and the school. Of course, an advisory committee from this group is being used in an effort to continually evolve the program to meet the needs of employees in the area concerned.

Subject Matter Content

As to the actual content of the subject matter for the class which is being prepared for advance training in agriculture, there has been little change. Problems of present day agriculture will continue to be the background of the material studied with the only change coming in the class time during the school day being allowed the student, a one hour period. In the local school system, in the past, vocational agriculture has met two periods one day, single period the next on an alternate basis. It is thought that the training being needed by the boys preparing for advanced education in agriculture need not be much different, if any, than the training given the boys preparing for farming. The only difference would be then that the boys preparing in farming, with a longer period every other day, could take more field trips and conduct more experimental work during the school day. There is no real reason that a girl student, or a town student might not be allowed to take vocational agriculture if a strong vocational interest is maintained, and an approved supervised practice program can be conducted. The vocational agriculture training for students preparing to farm will continue to be the heart of the vocational agriculture program, for this type program has been, is, and will continue to be a sound educational program in Iowa that can give all members of a class a basic background in meats identification, grading, and judging; however, judging team members should spend many additional hours of extra study for meats judging competition.

With the aid of reference materials from the National Livestock and Meat Board as well as various meat packing companies, the unit can easily be divided into three sections. These include,
(1) identification of retail cuts,
(2) carcass grading, and
(3) judging of primal cuts and carcasses.
These reference instruction manuals can be most effectively used in field trips to the local meat processing plant are utilized in conjunction with the instructional program.

The meats unit is designed for the Jr-Sr vo ag where the class periods are usually two hours in length. The following outline is a minimum for basic meats understanding:

Lesson #1
Introduction to meats—definition of terms.
Pork and lamb carcass and retail cuts identification.

Lesson #2
Test over previous day's work.
Beef carcass and retail cuts identification.

Lesson #3
Veal carcass and retail cuts identification.
Test over beef, pork, lamb, and veal.

Lesson #4
Field trip—local processing plant.
(Final test may be taken here or at classroom over identification of retail and carcass cuts.)

Ray Agan

Robert Severance

Lesson #5
Introduction to grading.
Beef grading.

Lesson #6
Pork grading.
Lamb grading.

Lesson #7
Test over grading.
Field trip to local processing plant.

Lesson #8
Introduction to judging—carcass and cuts.
Judging beef carcass and cuts.

Lesson #9
Judging pork carcasses and cuts.
Judging lamb carcasses.

Lesson #10
Final field trip and/or final testing.

References:
Meat judging Manual—Nat'l Livestock and Meat Board (50¢)
Assorted charts and material—Major Meat Packing Companies (free)

Instructors and students agree that meats work is just as much fun, if not more so, than live animal judging. In the final analysis the judging, grading, and identification is much more exacting and is not subject to individual differences of opinions.

Vo-ag teachers who have never taught meats have a genuine treat in store for them as well as their students when this meaningful learning experience is added to their vocational agriculture curriculum.

Teaching meats can be a pleasant and meaningful experience for instructor as well as students.

Guidelines Are Basic

HAROLD BINKLEY, Teacher Education, University of Kentucky

Guidelines for educational programs usually cause comments. They are cussed and discussed. Some are required by law to guarantee expenditure of appropriated funds as intended. The writer suggests that guidelines are needed for any new educational program and gives 21 specific guides for developing off-farm agricultural occupational programs, based upon experience.

Guidelines are needed to keep "in the ball park" people who plan and develop programs and to prevent them from starting programs with poor plans. Programs that are to provide training in nonfarm agricultural occupations must be vocationally sound and must be of high quality. Precautions must be taken to assure success in the new programs that are launched.

In a sense, the twenty-one guidelines suggested here are steps (in procedure) for developing programs in nonfarm agricultural occupations. There is some overlapping in the list.

1. **Keep in mind the pattern of instruction in vocational education.**—The pattern of instruction is class work and directed or supervised practice in the agriculture dealt with in class. This must not be forgotten. If the training is in farming, there is to be supervised practice in farming. If the training is in a nonfarm agricultural occupation, there must be instruction and supervised practice in the nonfarm occupation. Vocational agriculture has accepted the challenge of getting theory and practice experienced together. Getting theory and practice experienced together will make for quality in the programs in nonfarm agricultural occupations.

2. **Become familiar with the established programs.**—There are many kinds and types of programs throughout the country that have been going for a year or two. The more common ones are in such areas as: agricultural supplies—sales and service, farm power and equipment—service and repair, and vocational horticulture. Programs that have possibilities in a school should be examined for content of course of study, organization, and kind and quality of supervised occupational experience. If at all possible, after a teacher has decided to start a particular program, he should make arrangements to take some specialized training for the work he is to do.

3. **Discuss training programs with school administrators.**—The teacher should discuss in detail with his school administrators the possibilities of initiating a training program in nonfarm agricultural occupations. He should take a careful look at the requirements for a quality program. He should analyze with the school administrators the possibilities for providing training stations for supervised occupational experience. They should be clear on the equipment and instructional materials required and the costs. In addition, the teacher and school administrators should: 1) discuss the need for getting other school people and lay people to take part in the planning, 2) be clear on local studies or surveys to be made, 3) the understandings to be developed in the parents, students, business concerns, and lay people, and 4) be clear on the standards to be held to in the program.

4. **Have school administration appoint a steering committee.**—A steering committee appointed by school administrators is an effective way of getting other school people involved in the program, which will develop an understanding of and support for the program. Who should be on such a committee? Here are a few suggestions: a teacher of general mathematics, an English teacher, a teacher from each of the other vocational services such as home economics, distributive education, and business education. When these people have a part in planning the program, support is built for students being away from school during school hours for supervised occupational experience. Also, it can help clear up why the agriculture teacher may be away from school during the day.

5. **Determine the job opportunities and training possibilities.**—In one way or another the job opportunities and training possibilities should be determined well ahead of launching a training program in agricultural occupations. The findings from such a study of the community (or larger area) can have a definite bearing on the type and quality of the training program. Who should develop the survey instrument and conduct the survey? Perhaps the steering committee should be in on developing the instrument. Also most, if not all, of the male vocational teachers should have a part in making the survey. All teachers of agriculture in the department should help. The program should be a program of the school, not of one teacher. A good carefully conducted survey will provide many useful and interesting facts for program planning.

6. **Determine the competencies needed by employees.**—This is an important decision for the teacher to make. It must be in terms of the kinds of occupational experiences the students can get in the patronage area of the school through field, laboratory work, or in agricultural businesses. There are many published studies which can provide the teacher help in determining the significant competencies to be developed in a given type of program. There are two other possibilities to help "round out" and support the list of competencies. First, the teacher should visit several businesses of the type he has in mind to train workers for, sit down with the manager or the assistant manager and explain what he has in mind. Ask him what jobs a given man does in the business. Take notes. Then ask him what things he would like the employee to do in the business which he cannot now do (or do well). Making this kind of inquiry in a half dozen businesses will provide the teacher with much helpful information. Second, the teacher should go to four or five places of businesses, perhaps in another town, during a busy season and ask each manager if he may observe his employees work. Make clear to him the purpose. Observe two or three employees in each business for a half day, take detailed notes of what they do and say. This will provide the teacher with many ideas of the competencies needed for course building.

7. **Appoint an advisory committee.**—Before an advisory committee is appointed, the teacher(s) should be clear on what uses can be made of such a group. Some of the things an advisory committee can assist the teacher and the school with in developing programs in nonfarm agricultural occupations are:

Harold R. Binkley

—Determine the kinds of training needed in the community or areas
—Evaluate the kind and amount of occupational experience to provide
—Assist in developing an understanding of the program
—Enlist support of the community or area
—Secure training stations
—Assist in recruiting students and placing graduates
—Reflect public reactions to program
—Evaluate curriculum proposals

Who should be on the local advisory committee? The committee should consist of 9 to 12 people representing farmers, the agricultural businesses to be served, other agricultural businesses, farm organizations, farm representative of TV or radio station, and perhaps other civic minded persons interested in the over-all agriculture of the community or area. Professional people such as teachers, school principals, SCS men, and county agricultural agents should not serve on the advisory committee but should be used as consultants when their services are needed.

8. **Set aside enough teacher time to do the job.**—Setting aside enough teacher time to plan and carry out a new-type of program in vocational agriculture may be difficult. However, it is necessary if these programs are to have a sound instructional basis and the quality they should possess. It will take time for the teacher to develop his course of study, to develop the training stations with their memorandums of understanding, and to make his day-to-day preparation to teach the class in this new field. All people that have a part in developing a program in nonfarm agricultural occupations should exert their influence to see that the teacher is provided enough time to do the job well.

9. **Determine the course of study.**—The National Center for Vocational and Technical Education at Ohio State University is developing units of instruction for several courses of study, including these: Agriculture Supply—Sales and Service, Farm Power and Machinery—Sales and Service, and Vocational Horticulture. Each of the courses of study contains 10 to 15 units (or modules) of instruction. The units can be dealt with as they are set up in the courses, or the teacher can take three units from one, four units from a second, and six from a third, and "tailor make" a course of study to meet the needs of his particular groups of students. The competencies determined earlier by the teacher through his search of published studies, his personal interviews with managers and others, and his observation of workers in agricultural businesses will provide him sound cues as to the units he should include in his course.

10. **Select the students.**—Perhaps in some schools selecting students will not be a problem. However, a few considerations should be given attention. If students are to work in an agricultural business for their supervised occupational experience, the teacher must take the necessary action to assure successful experience in each. Not all students have the capacity to work in an agricultural-supply store. There are also students whose parents cannot or will not provide the necessary transportation for them to go to and from their work stations. Students should be selected for work experience who have time to do this type of work and also to keep up with their other studies in school. Selecting students and then developing individual class schedules around the work schedules requires detailed effort on the part of the teacher. To the extent possible, class and work schedules should be worked out in April for the school year ahead.

11. **Develop understanding on the part of parents.**—Programs in nonfarm agricultural occupations are departures from the on-going ones. Many of them will require supervised occupational experience away from the school and home. They will require work by the boys at a time of the year and at hours of the day which are convenient to the employing cooperators. This will be new to parents. If parents understand how the training program is set up, how it is to operate, the need for supervised experience in the occupation, and why the work experience must be at the convenience of the cooperators, they are likely to cooperate or let the teacher know why they cannot cooperate. With parent understanding, cooperation is likely to exist. Without understanding, there is no basis for cooperation.

12. **Develop instruments for evaluation.**—Before the teacher launches a new program, he should decide what initial evaluations to make, what evaluations to make during the program, and what evaluations to make at the end of the program. A few suggestions here: perhaps the teacher will want to develop certain pre-tests to give before he starts on each unit of instruction. The pre-tests may be pencil and paper or performance tests. The teacher will want to consider similar tests to give his students at the end of each unit of instruction to determine what the students have learned as a result of his teaching.

When boys are placed for occupational experience in agricultural businesses, the teacher will want to develop evaluation instruments to be used by the employers early, during, and at the end of the training program. Perhaps both the employer and the teacher will want to make evaluations of each student at these times and make them separately. The same evaluation instrument may be used by both the employer and the teacher.

13. **Arrange for the necessary training stations.**—For each student enrolled in a course in nonfarm agricultural occupations there should be a training station suitable for the type of training being provided in the class. Much of what has been said earlier applies here. The time of the year and the hours of work during the day should be worked out at the convenience of the employer—when the employer can make effective use of the student in his business. The teacher will need to be clear on the labor laws for employment, including age and wage rate for students in learning situations. Employers will want and expect teacher help on these matters. A meeting of cooperators with the teacher and the people of the Labor Department will be helpful in clearing up these points. Responsibilities and requirements must be made clear to the employers without too much delay or hesitation and with genuine enthusiasm by the teacher, or the employers will become weary in the delay of clearing up the uncertainties.

14. **Develop understanding on part of cooperators.**—Developing understanding may not be easy and cannot be done all at one time. At first, the teacher is interested in getting the employer to agree to employ the student on a part-time basis and to provide experiences for the boy in as many phases of the business operation as possible. At the beginning the cooperator may be somewhat limited in his vision of what the boy is capable of doing. To enlarge his vision, the teacher will want to provide the employer a copy of the course of study (in broad outline) and brief copies of the units of instruction and the learnings to be secured. Many of these things may have to do with store skills. The teacher will want the cooperator to provide the student with increasing experiences and responsibilities as he develops and shows interest.

As a part of the teacher's on-the-job supervision he should identify activities in which the student can be guided to take the initiative. Likewise, he will be able to suggest to the employer additional experiences and responsibilities which he may make available to the student. At the end of the first successful year of working with a cooperator the teacher should be able to move toward developing a training station which will be highly beneficial to both the students and the cooperator year after year.

15. **Develop memorandums of understanding.**—A memorandum of understanding should involve four parties: the student, the parents, the teacher on behalf of the school, and the cooperating employer. The memorandum should make clear the responsibilities of the four parties involved. It is suggested that the teacher first of all work with the boys in class in developing a clear understanding by them of their responsibilities (to themselves, to the school, to the boys to come later, to their parents, and to the teacher) in the training program. After each student agrees on what he will do (in the memorandum of understanding), the parents should spell out what they agree to do, and then the teacher on behalf of the school. After the first three parties named have stated what they agree to do, the employer should be approached in terms of what he can and will be willing to do in providing occupational experiences in his business.

16. **Study the jobs that students can perform.**—As mentioned earlier, a study of what employees in a business actually do as they work can be helpful to the teacher in determining his training program. Likewise, after students start to work, the teacher can observe his students perform their various jobs. He will be able to pick up many ideas for sharpening his training program and his individual supervision of students. He should develop a list of jobs performed by students (from the notes he keeps). It can be used as he teaches in the classroom. Not only jobs performed but attitudes, dress, how the student greets or approaches customers, and how he works with his fellow employees are all a part of studying the jobs which students can and will perform.

17. **Decide on the records to be kept.**—This decision involves two parts: records to be kept by the students and records to be kept by the teacher. **Records and Plans Book for Supervised Experience in Agriculture,** published by the French-Bray Company, seems to be quite adequate for the records in nonfarm agricultural occupations.

Records to be kept by the teacher on individual students should include such things as occupational objective, scores on standard school tests, scores on vocational tests, record of courses taken, record of supervised occupational experience—place, hours, earnings, and teacher and employer evaluations. The record should include an evaluation of the characteristics of the student when he completes the training programs, including his health habits, hobbies, and the like. As a final part of the permanent record there should be a place for the students' employment and further schooling for the next five years. **A Permanent Record Folder** published by Interstate meets this need.

18. **Supervise the practice of students.**—Many teachers may feel somewhat helpless at first in this area because of their lack of knowledge. This may be particularly true in the agricultural-supply business—sales and service and in ornamental horticulture. It is natural. At the same time, this means that the teacher must "dig in" and become knowledgeable. Three things mentioned earlier will contribute rapidly to a teacher's ability and confidence to teach and supervise his students in a new area of training. *One*: Take a specialized course to prepare him for the task at hand. *Two*: Observe some efficient and courteous employees in the same type of a business, perhaps in another town. *Three*: Start supervising students early by observing how they work and move about in their jobs. There is no question but that the alert teacher can come up with two or three helpful suggestions for his students on each supervisory visit. The boys will soon develop the feeling that the teacher knows his business.

19. **Keep the public informed.**—Provide the public with complete information of the new program, its purpose, how it is organized, and how it is to be carried out. Give recognition to the steering committee, the advisory committee, the students, parents, and the cooperators. Recognition can take many forms such as news stories, pictures, and TV, radio, and civic programs dealing with the new aspects of vocational agriculture. Results of the evaluation such as improvement in test scores and performance tests, and employment after completion of training should be made known to the public.

20. **Develop a plan for follow-up of students.**—It will be easy to know what students do the first year or two after completing their training. The teacher needs to decide what kinds of information he desires on his former students for at least five years after completion of the program. These yearly records should include such things as kind of employment, name and location of employer, and additional schooling completed. Perhaps it would be well to get the name and address of a person who will likely know the whereabouts of each student some fine years hence.

21. **Set up a timetable for getting program underway.**—If a new program is to "get off the ground" in a distinct and profound manner, the teacher should have a timetable. It will be helpful to the teacher if he will make a list of the "things to do" and then set them up in a sequence for doing, and place at the right of each "thing to do" a "by this date."

Shop Awards Program Stimulates Good Work

THOMAS R. STITT, Graduate Student, Ohio State University

A graduate of Oklahoma State University, the writer taught vocational agriculture in Kansas for five years. This is a step-by-step account of how he used an Awards Program to stimulate good shop work. The pictures are courtesy of Lincoln Arc Welding Foundation.

Thomes R. Stitt

As Vocational Agriculture teacher in Frankfort, Kansas, I had the problem of finding instructional aids in the teaching of agriculture mechanics. The agriculture students were predominately farm boys living on productive farms with corn, milo and soybeans the main crops. Swine and beef were the major livestock production enterprises. The students needed welding for building, maintenance and repair of livestock and crop production equipment. It was in this setting that I became aware of the tremendous value which I could make of the Lincoln School Shop Award Program.

More recently, I have found that other Vocational Agriculture teachers in other states have also become enthusiastic about this program. Norman H. Walker, Agriculture Mechanics teacher of Tulare Union High School, Tulare, California, says "this program is the best motivation I have found in shop teaching during my thirty-one years of teaching." Dale Pontius, Vocational Agriculture teacher of Mt. Vernon, Missouri states ". . . is highly valuable in promoting quality workmanship in arc welding as well as stimulating the areas of organization, drafting and writing." James L. Pollan, Vocational Agriculture teacher of Holdrege, Nebraska says in addition to welding skill which student learns, ". . . provides training in writing, drawing and self-expression with the written word."

The Program

The Lincoln Foundation School Shop Award Program is sponsored annually by the James F. Lincoln Arc Welding Foundation with a total of $15,000 to be awarded nationally. An entry is prepared by the student and entered in a classification on Farm, Shop, or Home and Recreational. Competition is on a regional basis with the regional winners competing for national awards. Further information may be acquired from the Lincoln Foundation. Each entry should contain a step-by-step explanation of how the project or job was done and at least one clear photograph, illustration or drawing of the project.

The key to enthusiastic participation by the student hinged on two basic ideas which were: (1) *It was a privilege to enter*, and (2) *the opportunity to win was equal to all.* The jury made awards based on practicality or usefulness, technical ability and imagination, clarity and completeness, safety, English, spelling and neatness, and finally adherence to the rules. While teamwork was good, it seemed desirable for a student to be able to say "I" not "we" built this project. Therefore, joint entries were not encouraged. Our schedule allowed spending two days a week in the shop, a part of which was spent on the project entry. The development of an entry was started in September and systematically developed throughout the year.

Planning the Project: All students were asked to prepare, in term paper style, an entry. Each student took one assignment at a time and attempted to develop an acceptable entry.

The first assignment was to decide what to build, to name the project, to give reasons for building the project, and the way the project would fit into the home situation. This information prepared in good written form became assignment one. This first assignment along with the official entry blank was put in a separate folder including the student's name.

The second through the fifth assignments were to make a top, side, and isometric scale drawing of the project to be built. Care was taken to insure that the student included the proper dimensions and welding symbols in this drawing. The exact time for the teaching of various skills was decided by the teacher but it was mandatory that it be taught before the student was expected to perform the skill for his entry.

In the sixth assignment a bill of materials and estimated cost was due one week after the last drawing was completed. It proved to be important that all of these things were done before the student was allowed to begin work on the project.

Assembling the Project: Assignments seven, eight, nine and ten were probably the most difficult and required the most motivation by the teacher. They were started the day the student began his project. Assignment seven was a written step-by-step procedure for building the project, assignment eight was a list of skills learned, and assignment nine was a list of safety practices which were to be followed. Assignment ten was to take pictures of the project at various stages of completion and to enclose in the transcript to help show the building procedure. After the project was completed, the student took

(Continued on next page)

Randy Butler earned fourth award with this corrugate opener built at Minidoka County High School, Rupert, Idaho

New Schedule Helps

DAVID N. ANDERSON, Principal, and Edward L. Hansen, Vo Ag Teacher,
Pahranagat High School, Alamo, Nevada

Here is a schedule providing flexible time schedule for varied activities in a vo ag program. Time for a real field trip! And in a small school too!

The development of a fixed daily schedule in high schools has required considerable time and effort on the part of administrators. The teacher of agriculture has often aided in planning the schedule for classes in Vo-Ag. Traditionally, these classes have been standard periods or double periods of time without regard to what was being taught. Each class offering was scheduled like every other class offering. Teachers of agriculture were expected to fit their instruction to the schedule, whether that instruction consisted of classroom work, teaching manipulative skills, or conducting field trips. Little variation has evolved from the basic class structure of the past. However, with the introduction of the modular schedule, a new approach to the use of the school day has emerged.

Experimental Programs

Pahranagat Valley High School, a small rural high school in southern Nevada, began experimenting with a modular schedule after becoming a member of the Western States Small Schools Project in 1962.

In the intervening three years before the 1965-66 school year, experiments were tried with many variations in modular scheduling. This type of scheduling, in many forms, provided better utilization of the school day and improved the relationship between instruction and time.

Beginning with the 1965-66 school year, experimental results indicated that complete flexibility in the school day could be achieved. A schedule to provide the right amount of time for any form of instruction, whether lecture, discussion, problem solving, field study, individual study, or shop practice was possible.

Schedule By Hand

The schedule responsible for achieving this breakthrough is the hand-generated daily modular schedule developed at Pahranagat Valley. (Hand-generated is our own descriptive term to prevent confusion with those schedules programmed with computers.) In procedure it works as follows:

Near the end of each day each teacher submits to the scheduling office his plan of instruction for the following day which includes time desired for each class. All the plans are then correlated and assembled into a master schedule and posted throughout the school building for the following day. Before leaving school each student checks the master schedule to determine which classes he is to attend the following day and makes his own personal schedule for the next day. In those modules of time that are free in his personal schedule, the student is responsible for scheduling independent study for himself.

It Works

The daily modular schedule of Pahranagat Valley High School has accomplished the following purposes, not only for the vocational agriculture teacher but for all teachers:

(1) The schedule has been changed from master of the curriculum to servant of the teacher.

(2) Teachers, rather than the administrator, are responsible for determining the amount of time needed to teach given concepts, solve problems, give demonstrations, take field studies, provide individualized instruction, etc. (It is realized that the amount of class time must be sufficient to satisfy the state board for vocational education.)

(3) With wise teacher requests for time, the student has more time for independent study and is given responsibility for the use of that time. (For independent study a library of material consisting of filmstrips, tapes, programmed instruction, overhead projector overlays, etc., is assembled in each department.)

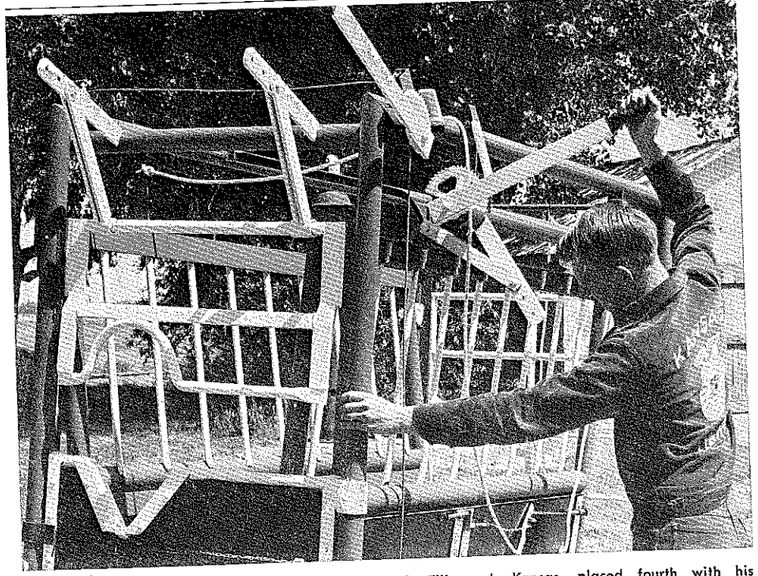
(4) The teacher's role thus changes from teaching only subject matter to directing learning.

Thomas S.Stitt

(Continued from page 16)

pictures of the top, side, end and isometric views of the completed project for assignment eleven. The student then assembled the report into the completed form ready for entry. Also, it was during this period that valuation of the completed projects, the skills learned, and the tools used during construction were discussed. Here the student began to develop the ability to analyze the procedure, consider alternate procedures which might have been used, and developed the full appreciation for the skills and abilities learned.

Recognition: Recognition of effort is an important means of motivation. The Frankfort FFA Banquet included a chapter farm mechanics display which began an hour before the banquet. Projects were placed in the parking area and a team of FFA members were on hand to show the display to all parents and guests. Inside the banquet room was a display of each student's completed entry with the students name on a card by the entry.



Douglas Peters of Ellinwood Rural High School, Ellinwood, Kansas, placed fourth with his combination squeeze chute-loading chute-trailer.

Small Gas Engine A Noisy Miracle for Teaching

LEE LAJEUNESSA, Vo Ag Teacher, Costa Mesta, California

Based upon two years experience, it is easy to see that this teacher uses the small gas engine for effective instruction. Details of program and facilities used are given.

One of the minor miracles taking place in America in the last decade has been the widespread introduction of small, self-contained, power machines. These packaged power units have virtually supplanted the hand-tool operations which formerly made the job of growing green things a mixed blessing.

Noisy, emitting foul gases, often hard to start, sometimes difficult to keep running, the small gasoline engine which forms the power heart of these small machines is a spitting, noisy minor miracle of engineering.

Despite their obvious drawbacks, these pint-sized packages of power have worked a revolution in urban and rural America. Because of its light weight, high power yield, adaptability and low cost, the small engine has been accepted as an emminently satisfactory substitute for hand labor operations. Virtually every horticultural operation formerly performed by muscle power can now be done faster, and in many cases, better, with a small engine. Mounting engines which rarely exceed ten horsepower, machines mow, till, clear land, saw timber, prepare seed beds, cultivate, spray, edge, vacuum, supply electric power, and perform a host of other jobs.

In Yard and Garden

Those millions of well-manicured lawns, the precisely-edged sidewalks, and picture-book gardens would not be possible without the power advantage so convenient to the hands of the professional and amateur horticulturist.

While homeowners alternately curse and caress these pony power packages, they would not substitute them for the formidable list of handtools which these small engines largely supplant. Depending on which side of the urban fence you are on, small engines can either be a sputtering invasion of your Sunday morning privacy, or a pleasant diversion to make a routine chore bearable.

Obviously, anything that takes the hurt out of hoeing, the woe out of mowing, and the edge off of edging is here to stay. These evil-smelling little monsters are unchallenged as the muscular heart of urban agriculture.

Programs of Instruction

With the necessity well established, it is surprising that more progress in the development of programs of instruction in small power has not been made. Agriculture teachers casting around for programs in mechanics which will satisfy the changing requirements of his urban-oriented community need look no further. A unit of instruction in power mechanics, with the emphasis on small engine servicing, repair, and maintenance is ready-made for the agricultural mechanics curriculum.

Lending itself well to the talents of the average agricultural instructor; inexpensive to set up and operate, requiring a minimum of shop space and special equipment; small engine instructional units are a curriculum "natural" for secondary schools. Best of all, they are a joy to teach.

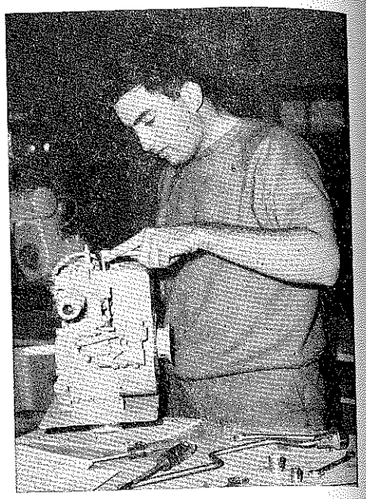
Some of the advantages inherent in such a program are obvious. The students, in this age of mini-bikes, go-carts, rotary lawn mowers, and power edgers, have a working, if not well-developed, familiarity with these little power packs. They know a little already, and would like to learn a lot more. Half the battle in instituting a curriculum innovation is in getting the kids interested, and in the case of power mechanics, the teacher need not sell the program, it sells itself.

Interest and Motivation

The high degree of interest and motivation expresses itself at all levels of ability, too. From the motor moron to the mechanical genius, all of these teens can benefit while enjoying such a unit of instruction. Because of the necessarily individualized nature of the program, students may race or plod along according to their natures. Retention and recall on the part of students is apparently very high as a result of the concentration on actual lab work.

Details of Program

The course of instruction included here is presently geared for high school sophomores, though it is applicable for any level. Course material ranges from the history of development of small engines to practical hints on trouble-shooting. Emphasis is given to practical laboratory work with about two-thirds of the sixteen weeks absorbed by this portion of the course. The balance of the time is given over to a series of short lectures on selected topics, demonstrations in procedures, and tool use on actual engines. Some problem solving work is given using a motorized engine which has proven to be the most effective teaching aid yet used by this instructor.



TEAR 'EM DOWN, BUILD 'EM UP!
Students enjoy the extensive "learning by doing" experience involved in detailed disassembly and build-up of the small engine. Organized and systematic instruction in the various engine systems accompany the shop work. Here a student uses an engine, tools and manual in a typical laboratory exercise.

A manual of instruction, provided in classroom quantities at no cost by one of the leading manufacturers of small engines, is used as the basic text. Accompanying this manual, which deals with principles of operation, is a repair instructions manual, similarly provided. These two paper-bound references, together with repair manuals for selected engine types, have been found to be quite satisfactory for use both by the students and for the instructor's reference.

A minimum of special equipment is required. In addition to the space and equipment requirements shown in the proposed laboratory sketch, a small engines tool kit stocking the specialized tools needed for repair work on small engines is suggested. These are supplied at nominal cost by various manufacturers of engines, or can be ordered through a local small engines repair shop. A suggested list of basic equipment and tool items is included to provide a guideline for those interested in establishing such a course.

Sources of information on the small gas engine are plentiful. A letter of inquiry to any of the manufacturers of small engines will bring a variety of information. Parts manuals, instructional booklets, and visual aids are available free or at low cost to schools requesting such material.

The engines, which may seem rather hard to come by, are to be found in plenty in student's garages, in metal scrap yards, and at small engine repair shops.

One Engine Type

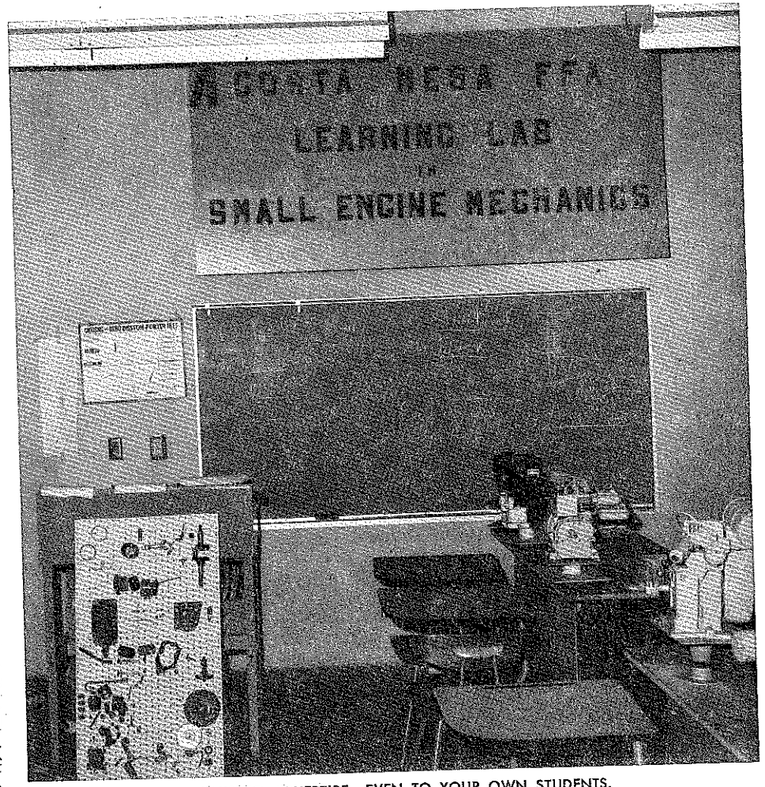
It is suggested, however, that the instructor setting up such a program, settle on one engine type for the bulk of his laboratory stations. Because of the advantages of what industrialists call interchangeability of parts, the job of instruction is made easier by the subtraction of what could be a large problem in maintaining a spare parts inventory. New instructors will also find that it is easier to become an expert on one engine type than to attempt to learn the idiosyncracies of several different kinds at once. Once the program is comfortably established, additions can be made to the engine inventory.

Combining an easily established need, a high level of inherent interest, ample supplies of reference and instructional materials, low set-up and operational costs per student, a small gas engines program has much to recommend it. When these plus factors are combined with the obvious usefulness of such education in this engine-heavy society of ours, agriculture teachers in both urban and rural programs would do well to take a careful look at how a Power Mechanics Course would fit into their own mechanics program. If your Agriculture Mechanics Program needs a lift, put it into a fresh new orbit with small gas engines.

Lectures

The following titles are selected lecture topics which have been prepared for the small gas engine course. Level of presentation can be adjusted for varying levels of students. These are suggested for their value as guide lines in the development of a complete program in small engine mechanics:

1. History of the development of small engines.
2. Basic principles of operation, heat conversion, transfer of motion, cycle of operation.
3. The 4-stroke cycle, an analysis.
4. Engine timing and the circular engine diagram.
5. Displacement, compression ratio and horsepower.
6. Ignition, a basic principle.
7. The parts and systems of small engines.
8. The power train.
9. Valve systems.
10. Induction and carburetion systems.
11. The structural system.
12. The ignition system.
13. Engine lubrication systems.
14. Engine control systems (governors).
15. Carburetion principles and systems.
16. Fuel and air ratios in engines.
17. Carburetor circuits and functions.
18. Carburetor adjustment, general hints.
19. Engine valve parts and adjustments.
20. Clearances in small engines.
21. Do's and don'ts in engine breakdown.
22. Basic trouble-shooting procedure.
23. Bearings in small engines, types, function, care.
24. Engine sizes and specifications.
25. Engine accessories.
26. Engine use.
27. Engine specifications.
28. Small engine servicing procedures.
29. Periodic maintenance of small engines.
30. Order of assembly and bench testing.



IT PAYS TO ADVERTISE—EVEN TO YOUR OWN STUDENTS.
Students are greeted every day with this sign. The small lecture-demonstration area adjoins the engine area. Seating for 20 students, a chalk-board, and space for mock-ups is provided for this program.

Lab Demonstrations

The following demonstrations are suggested for inclusion in a course of study on small gas engines. While this is by no means a complete listing, each of these should be demonstrated individually or to the group on an organized schedule or as the occasion presents itself.

1. Checking engine compression and spark.
2. Cleaning and adjusting sparkplug gaps.
3. Routine service of small engines, gas, oil change, air cleaner service, baffle cleaning.
4. Preparing engines for inspection and repair.
5. Removing housings and plates on small engines.
6. Carburetor idle adjustment.
7. Power adjustment on small engines.
8. Removal of flywheels.
9. Checking air gap, armature to flywheel.
10. Checking point gap.
11. Removing and inspecting cylinder heads.
12. Checking breaker point plunger holes.
13. Testing and removing condensers.
14. Testing and removing coils.
15. Checking end play on crankshaft.
16. Valve inspection and removal.
17. Piston and rod removal and inspection.
18. Camshaft removal and inspection of parts.
19. Crankshaft removal and inspection.
20. Cylinder, bore, glaze breaking, measuring and inspection.
21. Disassembly of connecting rod and piston.
22. Resizing cylinder bores.
23. Refacing valve and seats.
24. Replacing main bearing and seals.
25. Reassembly demonstrations as needed.
26. Replacement of engine power train, torque.
27. Replacement of head and torquing head bolts.
28. Bench testing engines.

(Continued on next page)

Lee Lajeunessa

(Continued from page 19)

29. Basic trouble-shooting procedure demonstration.
30. Basic check-up procedure.

SUGGESTED SHOP EQUIPMENT

20 Student Class

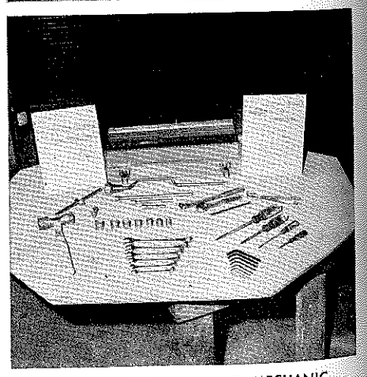
Quantity	*Description*
10	Two student beaches (w/casters)—dimensions, 2' x 4' x 33". Wood or composition top, metal enclosed base, 2 locking drawers.
10 sets	3/8 Socket Set—3/8" drive—w/ratchet; flex-handle, and sockets, 3/16", 1/4", 5/16", 7/16", 1/2".
10 sets	Box end wrenches, 1/4", 3/8", 5/16", 1/2", 5/8", 3/4".
10 sets	Screw drivers 4"—6"—8"—Standard
10 pair	Pliers
10 pair	Pliers, needle nose
10	Cans, safety gasoline, 5 gallon
1	Can, safety gasoline, 1 gallon
1	Stand, engine test
1	Valve seat refacing kit
1	Ammeter
1	Valve grinder, small gas engine
1	Wheel and gear Puller, universal type
1	Buffer, wire wheel
1	Hone, cylinder, small bore
1	Hand Lapping tool, valve
1 set	Micrometers, inside, 1/6" Lufkin
1 set	Micrometers, outside, 1/4" Lufkin
1	Gauge, Feeler, 20 leaf
1	Gauge, wire, spark plug
1 kit	Tools, B & S Kit #291661
20	Engines, B & S #6B or equivalent
1	Cabinet, engine storage, 20 compartment Compartment size 10" x 15" x 15" minimum
10	Scrapers, carbon
10	Files, triangular, 10"
10	Wrenches, crescent 8"
1	Tank, cleaning, 20 gallon capacity
10	Brushes, wire, small
1	Bore Hone
10	Hammers, Ball Peen, 16 oz.

TRAINING AIDS

Description	Where Available
1. Motorized small gas engine	Use verticle crankshaft Briggs & Stratton engine. Braze pully to crankshaft, connect to electric motor with gear reduction unit to allow speed of approximately 60 RPM.
2. 1 complete set of Overhead transparencies of Briggs & Stratton course as found in Manual "Theories of Operation". Pp. 1-25.	Manual available at 25¢ each from Briggs & Stratton Corp., Milwaukee 1, Wisconsin. Make transparencies from manual using Thermo-fax process.
3. Manual (use as text), "General Theories of Operation" from MS—3553-24 B & S Corp.	Briggs & Stratton Corp. Milwaukee 1, Wisconsin or Local dealer. (25¢ each)
4. Turn over Charts—Compression, Carburetion, Ignition, 20" x 24" Complete set of wall charts.	Briggs & Stratton Corp. Milwaukee 1, Wisconsin. Free upon request
5. Repair instruction manual. For use as a laboratory manual. Form MS 4750-54.	Briggs & Stratton Corp. Milwaukee 1, Wisconsin or local dealer.
6. 35mm Slide Set #1, 68 slides, "Complete Overhaul"	Briggs & Stratton Corp.....$6.80
7. 35mm Slide Set #2, 27 slides, "Check-up"	Briggs & Stratton Corp.....$2.70
8. 35mm Slide Set #3, 11 slides, "Resizing Cylinder"	Briggs & Stratton Corp.....$1.10
9. 35mm Slide Set #4, 12 slides "Valves and Seats"	Briggs & Stratton Corp.....$1.20
10. 35mm Slide Set #5, 12 slides "Bearing Replacement"	Briggs & Stratton Corp.....$1.20
11. 35mm Slide Set #7, 28 slides "Start, Stop & Store"	Briggs & Stratton Corp.....$2.80
12. Lubrication visual air consisting of 8 samples of lubricants in 4 oz. bakelite top jars. Mounted in wood base. SAE 10W, 20W, 30W, 90W, 10-30W, plus gas in water, oil in water.	Make own set

ONE STUDENT, ONE ENGINE. →

This small engines instructional unit occupies an area of about 400 syare feet. (20 ft. by 20 ft.) About five (5) square feet of bench space is provided for each student. Twenty students work comfortably in this shop area. Each station is provided with an engine on a moveable mount, a tool kit, a small vise and drawer space for small parts.



GOOD TOOLS MAKE THE MECHANIC.

This simple, inexpensive tool kit has proven quite adequate for the small engine program. A complete 3/8" drive socket set is supplemented with pliers, screwdrivers, an allen set and a plastic hammer. Manuals, provided free by one of the leading engine manufacturers, provide a valuable addition to the unit.

TECHNICAL DATA AVAILABLE

Title and Description	Where Available
1. **I & T Small Gas Engines Manual** Complete small engines service manual, all popular makes and models.	I & T Publications
2. Engine Pricing Guide, Briggs & Stratton Corp. Explains numerical model number system, describes and pictures series manufactured and quotes prices.	Briggs and Stratton Milwaukee, Wisconsin
3. Repair Instructions Book—4-cycle air-cooled engines—B & S. Complete component breakdown, checkup, overhaul, repair, and inspection procedures on basic engine models.	B & S
4. B & S Repair Instructions II—Information on repair and maintenance of basic engine models.	B & S
5. Clinton Service Manuals—1	Available upon request from Company — ask for specific model manuals
6. Wisconsin Service Manuals	"
7. McCullough Service Manuals	"
8. Toro Service Manuals	"
9. Sears Service Manuals	"
10. Film—The Otto Cycle	Education Film Library County or Universities
11. Film—Friction	"
12. Film—The Diesel Story	Shell Oil Company

Wanted: Better Communications

CLAYTON RILEY, Director, Demonstration Center,
Reidland High School, Puducah, Kentucky

This center is open to teachers, administrators and other interested personnel to observe an agricultural occupations program in sales and services. Reidland High School was selected to participate as a demonstration center after 18 months work as pilot program. This program operates on funds from Section 4-C, 1963 Vocational Education Act.

Would you believe that the following could happen in today's modern world in a community of 40,000 with every media of communication at its disposal?

A new vocational program is started with the teacher working to develop teaching aids, instructional techniques, methods of supervision and other areas common to a new program, while less than four miles away two similar programs were in operation by another vocational service, and neither teacher was aware of what the other teachers were doing.

We must admit this did occur in Paducah, Kentucky. Reidland High School Department of Vocational Agriculture was operating an agricultural occupations class in sales and services; a nearby high school was operating a distributive education program. Both of these schools were placing students in local businesses for occupational experience. The local Area Vocational School was conducting evening classes in distributive education. Yet, for several months the teachers did not know of the other programs in operation. Tragic—but true. What a waste of time and energy. And, think of the individual hours spent by these teachers in developing materials which could have been avoided if we had known what the other was trying to do. In order to avoid similar situations in the future, the Kentucky Bureau of Vocational Education has encouraged the organization of district vocational groups in the state to encourage program development and communication between services. We shall not soon forget the look on the faces of one another when we found out, in conversation, what each was doing in his respective school. Though our areas were different each of us had encountered many similar problems.

Lee Lajeunessa

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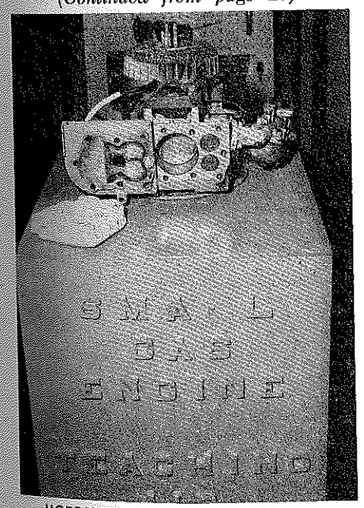

MOTORIZED GAS ENGINE A PRICELESS TEACHING AID.

With a six (6) inch pulley brazed to the vertical crankshaft and attached by a V-belt to a fractional horsepower egg-grader motor and gear reduction drive, the motorized engine turns over at 56 R.P.M. The aid is invaluable for teaching 4-stroke cycle theory, events that occur during operation, and to visually demonstrate problems in wear, lubrication, timing and trouble-shooting.

Now

What has happened since we have become acquainted and established communications? Worried that the other fellow is doing "my" job, getting in "my" area, avoided talking, showing, and explaining features of our programs that could be helpful to each other? No—we have worked together, sharing experiences and cooperating with each other. We have, in the last few months:

Visited each other's departments
Audited the classes of the other
Exchanged teaching materials and techniques
Encouraged visitation by other members in our departments

Perhaps our best achievement occurred March 2, 1966, when we held a vocational occupations workshop for all teachers in the area who were conducting or planning to start such programs. Those in attendance came from six counties and two states and included teachers of agriculture, home economics, guidance, distributive education, business and office occupations, adult education, trades and industry, and local administrators.

Others

How many of you are not familiar with the other vocational programs in your area? It is really hard to concede, but there are many people in all communities, not only in schools, but in industry, who are knowledgeable and more than willing to assist us with sound vocational programs, if we will open our doors to them and knock on their doors for information, encouragement, and assistance. We have read and heard how our early agriculturists were independent and self sufficient. In the world of modern agriculture we must depend upon others if our programs are to be successful.

We in Kentucky are concerned about the progress being made in all aspects of vocational education not just in a particular area. It has been said that an effort fails more because of internal problems than external. Many of our problems in vocational education can be solved by involving people in other vocational services, business, and industry.

A wonderful teaching-learning situation on a supervisory visit, with refreshments!

T. T. -n- T. T.

W. FORREST BEAR, Agricultural Engineering, University of Minnesota

Here is an approach to developing understanding along with skills in producing a needed product in teaching in the shop. Project sheet to help develop these needed concepts is shown.

Have you ever completed a session in the agricultural mechanics laboratory with your vocational agriculture students and then heard another teacher or adult ask this question. "Well, what did you learn during the past two weeks"? I am sure that many vocational agriculture teachers have experienced this and in some cases the teacher can point with pride to the student's response happy with the response. The student might say, "I didn't learn anything; all I did was make a hitch pin, chisel, "C" clamp or some other project." There is a possibility that the boy was right. He did not learn as he was only sawing metal, bending metal and assembling the various components for welding. There, no doubt, was a certain amount of learning while he was doing these processes whether the teacher was teaching or not.

Another teacher could well be making the same projects with his class and the student would have given a much different response. The student might say as he examines the project, "I made this hitch pin; however, the abilities that I learned during the construction can be used later as I construct projects and do service and repair work." He would continue by saying that he had also achieved a good understanding of metals, the use of tools and their applications.

T.T.—n—T.T.

As we examine the responses of these two students it is easy to realize that one teacher had an organized program, whereby the true objectives of project construction were explained and the hitch pin was merely a tool to achieve this goal. The hitch pin could be compared to the microscope that must be used to view a specimen in a biology class. Should the first teacher be criticized for his approach in teaching project construction? Many teachers forget the fact that in addition to being teachers they are also salesmen. With this philosophy we must look to the title of this article which is; T.T. -n- T.T. Too often teachers get involved with details and routine of daily life and forget to stress objectives. The initials in the title refer to, "Tell Them, Teach Them, and Then Tell Them What You've Taught Them." Possibly the second teacher followed this philosophy because his student had a clear understanding of the principles involved in construction of the hitch pin.

Project Sheet Helps

One of the best devices to help promote this philosophy is to use a project sheet as illustrated. Students want a plan to follow during project construction. The students will be working at different rates; therefore, when each student has a plan he can progress at his own speed. It will be easy for him to select the materials as listed in the bill of material, check the measurements on the plan and start to layout the project. The construction procedure is briefly outlined for the student to be more efficient. He will acquire the ability to use tools for certain jobs and the understanding of different concepts. These understandings will transfer to other shop and work activities. As the student works on the project he will be reminded of these abilities and understandings, especially if study and discussion is conducted by the teacher in the classroom or laboratory during the instruction process. The evaluation of the project will come upon its completion. It is much easier for the student to understand and construct the project if he knows the standards by which it will be rated. An evaluation score sheet is included on the same sheet. As illustrated the drawbar hitch pin sheet follows the philosophy by showing the students what will be constructed, telling how to go through the construction process and then reminding him what has been taught during the process. To complete the cycle of good educational practices it would be advisable to send both the completed project and the plan sheet home with the student. The parents can see the efforts of the student and they too will recognize the fact that the hitch pin is not the most important item or end product, but rather the acquiring of abilities to do and an understanding of the concepts.

DEPARTMENT OF AGRICULTURAL ENGINEERING
UNIVERSITY OF MINNESOTA

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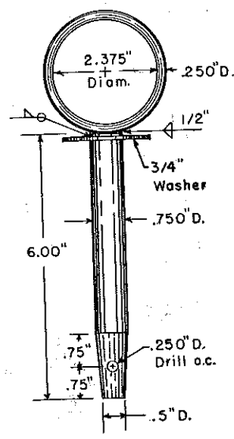
DRAWBAR HITCH PIN



Bill of Material

1 - 1/4" x 8" M1020 hot rolled round
1 - 3/4" flat washer
1 - 3/4" x 6" round, C1042 cold rolled or C1045 hot rolled

Name: _____

Date: _____

Grade: _____

Construction Procedure:

1. Determine length of handle; I. D. + Thickness x 3.14
2. Shape handle around 2" pipe, use vise as bending aid
3. Cut pin to length
4. Drill hole and shape end of pin
5. Weld washer to pin
6. Place handle on pin and weld
7. Remove slag and clean with steel brush

(Ability to .....
Construction teaches (Understanding of .....

1. U. Difference between low and medium carbon steel
2. U. Difference between hot and cold rolled steel
3. A. Determine length of handle
4. A. Measure distances
5. U. Correct hacksaw blade to select
6. A. Use the hacksaw
7. U. Need to center punch before drilling
8. A. Use center punch
9. U. Need to secure metal before drilling
10. A. Secure metal in drill vise
11. U. Need for correct drill speed
12. A. Adjust and use drill press
13. U. Correct grinding wheels and belts
14. A. Adjust tool rests on grinders
15. A. Grind pin end
16. U. Correct electrode selection
17. A. Weld on handle and washer

Evaluation Score Sheet:

Item	Points Possible	Earned
1. Length of pin	5	
2. Tapered area smooth	10	
3. Washer square to pin	10	
4. Washer spaced correctly	10	
5. Weld on washer	15	
6. Round handle	10	
7. Handle centered	10	
8. Weld on handle	15	
9. Hole centered	5	
10. Attitude and work habits	10	
Total Points		

Raymond Agan

(Continued from page 5)

world. *How* can we do this? What methods of teaching become more important? Are we faced with a situation where "learning by doing" is no longer sufficient and we must teach "that body of knowledge most transferrable" and discard forever the term of "terminal education"?

Two Dimensions

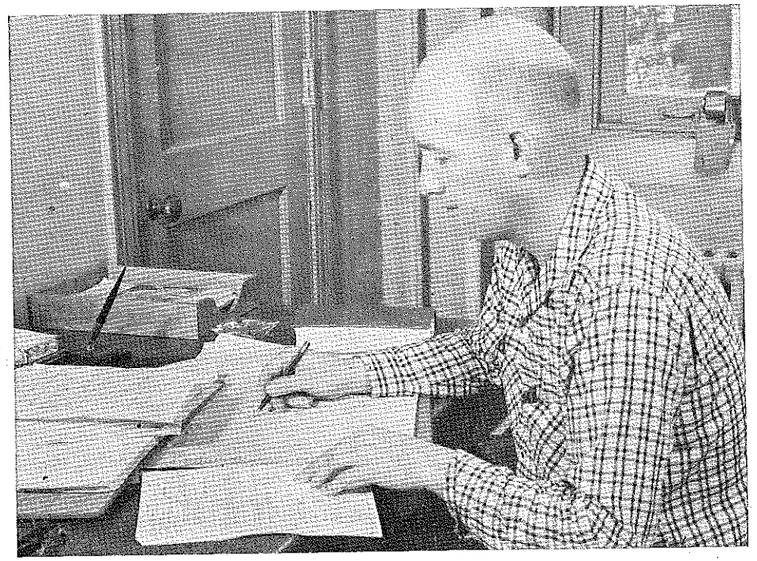
The critical elements of teaching method apparently include the process of thinking (recall and use of facts), understanding (seeing cause and effect relationships), and applying (repetition for fixation by doing.) Interest must be native or induced by the method. We then have a vertical-cross-sectioning of objectives. Horizontally we have the objective of production agriculture, occupational opportunities and occupational experience. Vertically we have the objectives of thinking, understanding and applying. The subject matter to supply the meat which attaches to this skeleton of teaching method, starts with those desirable and worthwhile things the students are tending to do—for us as agricultural teachers—agriculturally. It is most important that we start where they are. By drawing subject matter from these perceptive experiences of students, basic concepts may be established which, when applied through the thinking and understanding processes, make it possible that decisions may be made, goals established, strategies planned, work organized, and application made.

Basic Concepts

Basic concepts, thus taught, grow like snowballs rolled in wet snow as they are applied to life situations. It matters not, in the long run, if the area of technical subject matter we call "X" is not in the curriculum. If we have, as teachers, taught these other things well the student will through intellectual curiosity and transferrable knowledge and the use of well-founded concepts, meet the demands of the untaught subject area when he is faced with needing it. Naturally, subject matter must be carefully taught but it cannot be all taught.

Some Examples

For example, cotton raising has not customarily been taught in the vocational agriculture programs of Kansas. Yet, I dare say, that a well-trained graduate of Kansas Vocational Agriculture would have the ability to successfully farm in a cotton growing area, because he would use the same concepts of crop production in Kansas, blending them to new techniques and knowledges which he would have learned to acquire, analyze, and apply. The three "A's" of knowledge—acquiring, analyzing, and applying—combined with basic concepts resulting from worthwhile educational experiences, becomes the key to success of educating youth for a world of knowledge new and strange to them.



Not as pleasant as the home visit with watermelon, but here is an essential part of the summer work of an effective teacher of vocational agriculture.

Another example comes in the area of occupations. Assuming the average worker in agricultural occupation changes jobs seven times in his career, an important part of the educational process becomes the teaching of the ability to acquire information at the proper time about now unknown occupations, analyze both the occupation and self for compatability and decide whether the self has the ability to apply his traits toward success in the occupation under consideration. This is a different objective than covering a pamphlet or textbook about occupations. The objective of giving the student a body of concepts about self and practice in applying such concepts through the understanding and thinking processes involved in new occupational situations becomes a more important objective and it leads to a much improved process over the trial and error processes at the seven job changing periods of an occupational career.

Also important in our consideration of objectives for education is the fact that for every student with the I.Q. of 120 there is a student with an I.Q. of 80. We must also keep in mind that there are actually five types of "knowing"—(1) memorization, (2) cognition (understanding), (3) convergent thinking, (4) divergent thinking (creativity, ways of seeing items) and (5) evaluation (good, bad, beautiful, etc.). Our schools have in the past emphasized one and two types of "knowing". This does not meet the needs of all our pupils.

Concentrate on Concepts

With so much to teach at so many different levels, if our teaching objective can be to organize the world of agricultural objects and events into a smaller number of categories called concepts and perhaps the concepts further organized into hierarchies of rank order as those used in the biological sciences, and if the student "learns by doing" in applying "transferrable bodies of knowledge", using his own peculiar set of qualifications and characteristics, following the basic steps of scientific thinking and seeing the cause and effect relationships related to developing understandings, and if in all this process he learns to live with his fellowman, we yield a better educated individual more aptly prepared to meet tomorrow's world of yet undiscovered subject matter and yet unidentified agricultural occupations.

Wm. Paul Gray spent sixteen days in the Hawaiian Islands participating in leadership activities, and in the Hawaiian State FFA Association Convention in Honolulu which was attended by 380 boys. One afternoon he met with 38 State staff members and teachers.

Stories In Pictures

GILBERT S. GUILER
Ohio State University

Teaching agri-business classes requires specialized training on the part of the teacher. A group of vocational agriculture teachers are taking part in a horticulture seminar at Ohio State University.

Training in Nursery operation at Breaux Bridge, Louisiana has become a popular part of the Vocational Agriculture curriculum. Photo—Atherton

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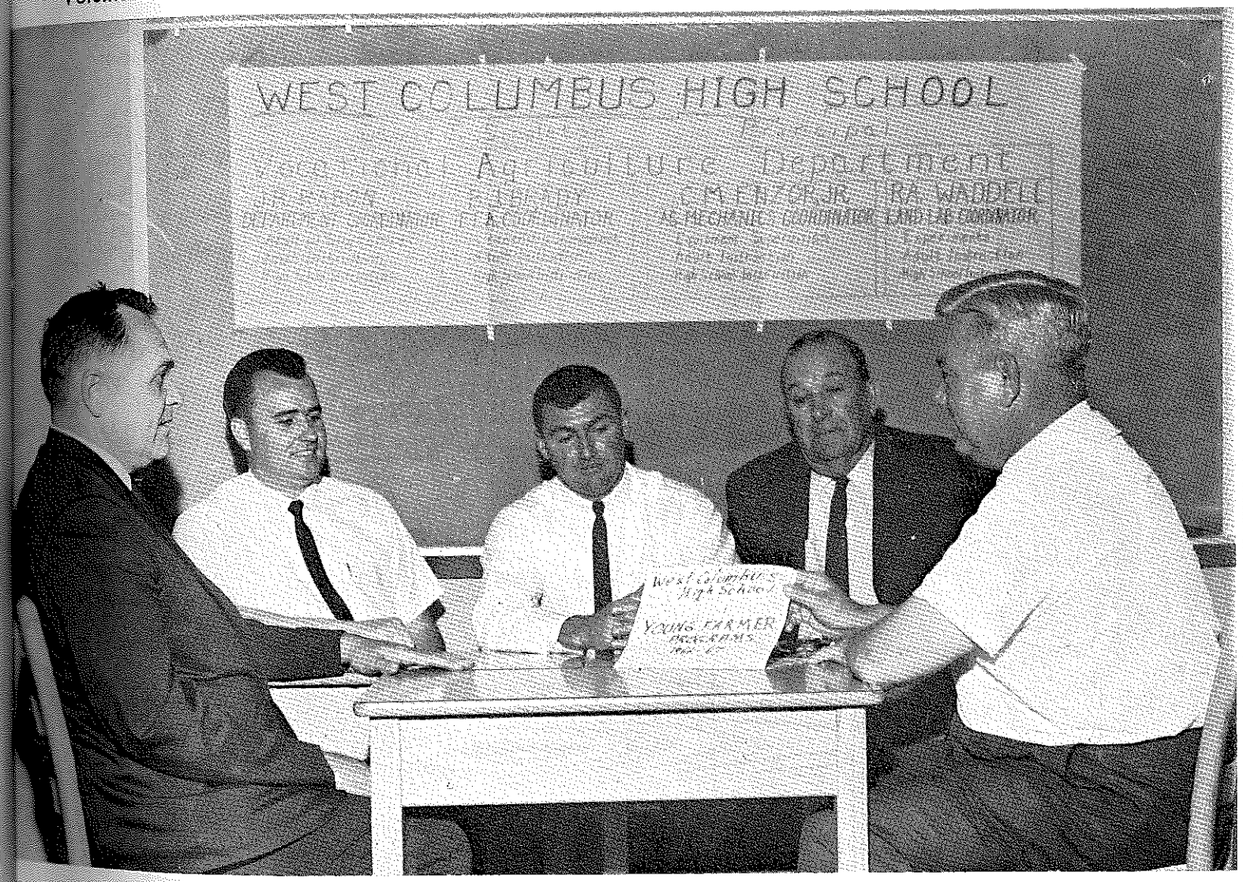

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Multiple Teacher Departments