

COMPREHENSIVE PROGRAMS BASED ON COMPETENCIES  
RATHER THAN CONTENT AREAS --FOR AGRICULTURAL  
EMPLOYEES\*

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The Vocational Education Act of 1963 had implications for providing vocational education based on needs of people rather than on content or particular subject matter areas.<sup>1</sup> The Vocational Education Amendments of 1968 gave further direction along this line.<sup>2</sup> No longer are the various fields of vocational educational identified in Federal legislation, with the exception of home economics. It seems obvious that Congress intended that broad vocational education programs should be planned where possible. When planning such programs, many factors must be considered. Foremost in importance is to meet the interests and needs of the individual and to provide him with the knowledges and skills necessary for gainful employment.

In order to prepare persons for employment, it is first necessary to examine the structure of occupations and the labor force. Both structure and the labor force are in a continuing state of change. Existing occupations become obsolete and new occupations are created. Technologies create demands for new competencies. Occupational mobility is increasing rapidly, not only in terms of geographical mobility, but vertically, toward more demanding occupations in terms of skills and educational requirements.

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Vocational education programs, in order to better prepare a person for employment should be based to a large extent on what a person will be doing on the job and what he needs to know. When planning educational programs, it is impractical to develop a different program for each of the thousands of job titles. If, however, people employed in a variety of jobs require similar competencies, courses of study can be planned accordingly. This may require implementing new types of educational programs in agriculture. Since knowledge of what people do and what they need to know are basic to planning any sound vocational education program, the fundamental problem is that of determining the competencies needed for their jobs.

Many studies have been completed in recent years which attempted to ascertain employment opportunities and competencies needed by employees in different agricultural occupations. There have, however, been relatively few studies conducted which has as their primary objective the identification of common competencies needed by workers across the various jobs.

Studies by Phipps<sup>3</sup>, Brown<sup>4</sup>, Dillon and Cain<sup>5</sup>, Bundy and Blake<sup>6</sup>, Mondart and Curtis<sup>7</sup>, and Baker<sup>8</sup> are rather global in nature and attempted to determine employment opportunities and abilities needed by workers in off-farm agricultural jobs.

Courtney<sup>9</sup>, in his analysis of knowledge and experience levels needed by workers in three agricultural occupations, pointed out that if the "centrifugal" approach was used, both farmers and workers in non-farm agricultural occupations could be served by a single course. Such a course would contain knowledges and experiences common to both groups. Research conducted by Sjogren<sup>10</sup> suggests that curriculums designed to provide comprehensive work in production agriculture would include those knowledges and understandings needed by workers in the agricultural industry occupations and agri-business occupations.

An attempt was made in Nebraska to inventory occupations and analyze the knowledges and skills needed by a sample of employed persons. More specifically, the purposes were:

1. To ascertain the various kinds of jobs held by workers in Nebraska.

2. To analyze the opinions of a sample of workers, in agricultural occupations, regarding the knowledges and skills needed to perform their jobs.
3. To specifically identify jobs requiring knowledges and skills in agriculture.

An interview-questionnaire was administered to a random sample of 1,500 persons between ages of 20 and 70. The sample was drawn from personal property tax rolls in 14 index counties. Each of the 14 counties was identified by Knox<sup>11</sup> as being "most representative" of a group of similar counties based on his study of various economic, educational, and other characteristics of the adult population.

The total adult population in Nebraska between ages 20 and 70 was identified as the population for the study. According to the 1960 census, this group numbered 752,636 people. The ratio of adults sent questionnaires in each index county was to the total sample as the adult population in the group of counties represented was to the total adult population in the state. For example, the adult population in the seven counties represented by Adams County constituted 2.09 percent of the total state adult population; therefore, 31 questionnaires (2.09 percent of 1,500 sample) were sent to persons in Adams County. Non-respondents were interviewed personally.

Each employed worker in the sample was asked to respond to a checklist of 144 activities, duties, knowledges and skills relative to their requirement in his job, 24 of which were identified as agricultural.

Usable questionnaires were obtained from 1,316 employed persons--1,228 male and 88 female workers. Although questionnaires were received from all of the 1,500 persons in the sample, 184 or 12.3 percent were unemployed or retired. The employed workers represented 398 different job titles as defined by the Dictionary of Occupational Titles.<sup>12</sup>

With regard to the major function of the business in which the workers were employed, more than one-third of all workers indicated that they were engaged in farming or agricultural business pursuits. A total of 185, or 14.1 percent of the workers

indicated that they were employed in some type of wholesaling or retailing business. Ninety-two, 7.0 percent were in construction; eighty-eight, 6.7 percent in public service; and seventy-seven, 5.9 percent, were employed in business and repair services. By combining both durable and nondurable manufacturing, it was observed that one hundred nine, 8.3 percent, were so employed. All other types employed less than five percent.

Employment as identified by the workers and categorized in another way, that is, according to the Dictionary of Occupational Titles, 1949 edition, also show that there were more than one-third of the workers who indicated that they were employed in the Major Occupational Groups of agriculture. The professional group accounted for more than 22 percent of all workers. Fifteen and six-tenths percent indicated they were in clerical and sales work, and 13.8 percent in skilled, while slightly more than 3 percent of the workers indicated that they were employed in occupations identified as services and as unskilled.

In the area of agricultural occupations, a jury of experts in vocational education were consulted in order to determine in still another way, which of the 398 occupations were agricultural occupations. A total of 45 job titles in which a total of 502 persons were employed, were identified as being in the field of agriculture, or agriculturally oriented jobs. This represented slightly more than 38 percent of the total workers in the sample population.

Of the five hundred two agricultural workers, four hundred thirty-five, or 86.7 percent, were considered as being engaged in production agriculture, while sixty-seven, 13.3 percent, were employed in off-farm agricultural occupations. A list of the agricultural occupations is appended.

Important findings in the study pertained to areas of knowledges and skills required by those persons employed in agricultural occupations. Of the 106 different knowledges or skills on which agricultural workers provided data, three were checked by 75 percent or more of the respondents. Twenty-nine items were checked by 50 percent or more of the workers and 56 of the 106 items were checked by one-fourth or more of the agricultural workers. Table I shows the ranking of those knowledges and skills required by 25 percent or more of the agricultural workers.

TABLE I  
RANK ORDER OF THE FIFTY-SIX KNOWLEDGES AND SKILLS  
REQUIRED BY TWENTY-FIVE PERCENT OR MORE OF THE  
AGRICULTURAL WORKERS

Rank	Area of Knowledge or Skill	Percent
1	Livestock	82
2	Farm Machinery	80
3	General Agriculture	76
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4	Animal Disease	74
5	Mechanics (Tractor)	73
6	Feeds	73
7	Agricultural Economics	73
8	Animal Nutrition	73
9	Marketing	72
10	Weed Control	72
11	Farm Buildings	71
12	Crops and Plants	70
13	Bookkeeping	70
14	Insect and Pest Control	69
15	Soil and Water Management	69
16	Tractor and Other Power	69
17	Farm Conveniences	68
18	Handling Money	68
19	Soils	67
20	Welding	66
21	Taxes	63
22	Credit	62
23	Buying or Purchasing Principles	58
24	Carpentry	58
25	Plant Diseases	58
26	Grasses	58
27	Insurance	56
28	Hydraulics	52
29	Business Management	51
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30	Investments	46
31	Accounting	45
32	First Aid	44
33	Grain Grading	44
34	Mechanics (Auto)	42
35	Filing	41

TABLE I (continued)

Rank	Area of Knowledge or Skill	Percent
36	Inventorying	40
37	Painting	39
38	Chemistry	38
39	Law	38
40	Shrubs and Trees	37
41	Economics	36
42	Measurements	33
43	Control Credit	33
44	Dairy	32
45	Poultry	32
47	Pricing	32
47	Advertising	31
48	Transportation	30
49	Grooming and Personal Care	30
50	Real Estate	30
51	Salesmanship	28
52	Control Purchases	27
53	Heating	27
54	Business Principles (Law)	26
55	Turf Management	25
56	Spray Painting	25

The results of this study indicate that persons employed in agricultural occupations, whether on-farm or off-farm, need and use many similar knowledges and skills. There were also many non-agricultural workers who indicated a need for agricultural knowledges or skills. Peterson, in his study involving two metropolitan Nebraska counties, suggests that 20 percent of those not engaged in agricultural occupations, expressed the need for agricultural knowledge or skills.<sup>13</sup> The data also indicated that not all of the knowledges and skills needed by agricultural workers are strictly agricultural in nature.

In companion phases of this study, similar observations were made in regard to each of the other occupational areas. That is, not all knowledges and skills judged necessary for job performance were related solely to that area.

When comparing the data found in Table I with data in the other areas, it was observed that many of the knowledges and skills were needed by workers in all areas.

The results from this study indicate that attention should be given to teaching the commonalities necessary for job performance. This will require the planning of comprehensive vocational education programs; programs which cross traditional subject matter lines and thereby utilize the best qualified teacher to teach the competency in question. Thus, it will be possible for the instructor of vocational agriculture to teach in the areas of his competency. At times he will be teaching students who are pursuing careers in trades and industrial occupations, distributive occupations and others. Competencies then become the core of a broad-based program of vocational education, yet are planned to become a part of the individual student's program of vocational education regardless of his area of study.

#### References

<sup>1</sup>Public Law 88-210, 88th Congress, H.R. 4955, December 18, 1963, Washington, D. C.: United States Government Printing Office, 1963.

<sup>2</sup>Public Law 90-576, 90th Congress, H.R. 18366, October 16, 1968, Washington, D. C.: United States Government Printing Office, 1968.

<sup>3</sup>Phipps, Lloyd J., et. al. "Technical Education in and for Rural Areas," Agricultural Education Division, Vocational and Technical Education Department, College of Education, University of Illinois, Urbana, 1964.

<sup>4</sup>Brown, Bert L. "Training Needs of Workers in Businesses Associated with Agriculture." Washington State Board of Vocational Education, Olympia, Washington, 1959.

<sup>5</sup>Dillon, Roy D. and Cain, Paul S. "Employment Opportunities and Usable Agricultural Skills in Non-Farm Agricultural Occupations in Appalachia." Morehead State University, Morehead, Kentucky, 1966.

<sup>6</sup>Bundy, C. E. and Blake, D. L. "Competencies in Agriculture Needed by Males Employed in Off-Farm Agricultural Occupations." Cooperative Study, State Department of Education, Des Moines; and Iowa State University, Ames, 1965.

<sup>7</sup>Mondart, C.L. and Curtis, C.M. "Occupational Opportunities and Training Needs for Non-farm Agricultural Jobs in the Metropolitan Areas of Louisiana." Vocational Agricultural Education Pub. No. 6, School of Vocational Education, College of Agriculture, Louisiana State University, Baton Rouge, 1965.

<sup>8</sup>Baker, Richard A. "A Study of the Educational Needs for Workers Engaged in Off-Farm Agricultural Businesses in Alabama." Auburn University, Auburn, 1966.

<sup>9</sup>Cortney, Elwood W. "A Comparison of Knowledge and Experience Levels Required in Three Agricultural Occupations." Unpublished Doctoral Dissertation, Purdue University, Lafayette, 1963.

<sup>10</sup>Sjogren, Douglas, et. al., "The Identification of Common Behavioral Factors as Bases for Pre-Entry Preparation of Workers for Gainful Employment." U.S. Office of Education, Project OE-6-85-073, Colorado State University, Fort Collins, and University of Nebraska, Lincoln, 1967.

<sup>11</sup>Knox, Alan B. "The Baseline Study of Adult Participation in Nebraska." University of Nebraska, Office of Adult Education Research, Lincoln, Nebraska, 1963 (Mimeographed)

<sup>12</sup>U.S. Department of Labor, Dictionary of Occupational Titles, Second Edition, Vol. I and II, Washington, D.C.: United States Government Printing Office, 1949.

<sup>13</sup>Roland L. Peterson, Indications of Agricultural Knowledge and Skills Areas Needed by a Sample of Workers in Two Metropolitan Nebraska Counties, M.S. Thesis, University of Nebraska, Lincoln, 1966, p. 60-61.

Appendix

LIST OF OCCUPATIONS IDENTIFIED AS BEING AGRICULTURAL  
OR AGRICULTURALLY RELATED

By D. O. T. Number

D. O. T. No.	Job Title
01240	Farm Checker
03503	Soil Scientist - Soil Conservationist
03512	Fish and Wildlife Specialist
07221	Manager, Retail Food
07222	Manager, Retail Dairy Products
07271	Manager, Retail Hardware and Farm Equipment
07272	Manager, Retail Lumber and Building Supplies
09163	Manager, Grain Elevator
09511	Food and Drug Inspector
09518	Agricultural Inspector
09594	Cattle Inspector
09751	Owner, Meat Processing
14852	Appraiser, Real Estate
16310	Real Estate Salesman
18522	Salesman, Foodstuffs
18616	Salesman, Farm and Garden Equipment
30110	Cash Grain Farmer
30410	Dairy Farmer
30610	General Farmer
30710	Livestock Farmer
30760	Farmer, Animal
30810	Poultry Farmer
31110	Farmhand, Grain
31410	Farmhand, Dairy
31522	Harvest Hand, Fruit
31610	Farmhand, General
31720	Cowpuncher
31810	Farm Hand, Poultry
33710	Farm Manager
34004	Grounds Keeper
34006	Landscape Gardener
34913	Sheep Shearer
409205	Beef Cutter
558100	Meat Butcher

