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By-Dillon, Roy D.; Horner, James T.

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To determine competencies and activities used by workers in a cross section of the statewide labor force, data were obtained from a random sample of 1,500 employed persons drawn from 14 purposively selected index counties in Nebraska. An interview-questionnaire procedure yielded an 87.7 percent response to a checklist of 144 activities, duties, and areas of knowledge. Additional data were obtained concerning functions of the businesses in which the workers were employed and prerequisites for their jobs, including educational requirements. When placed in a major occupational group based upon their major job requirements, 33.5 percent were in agricultural jobs on and off the farm, 22.4 percent in professional and managerial jobs, 15.6 percent in clerical and sales, 13.8 percent in services, and 3.3 percent in unskilled jobs. Of the 144 activities and knowledge areas on the checklist, 11 were checked as used by more than 50 percent of the respondents, 5 by 40 to 50 percent of the respondents, and 7 by 33 to 40 percent of the workers. Activities with 33 percent or more response were viewed as common components for vocational course instruction. Recommendations included an interdisciplinary approach across vocational subject areas in basic courses with persons moving into specialized vocational courses for the more specific and advanced competencies required. (DM)

OCCUPATIONAL COMMONALITIES: A BASE FOR COURSE CONSTRUCTION*

Roy D. Dillon
and
James T. Horner
Co-Directors, Nebraska Research Coordinating Unit
University of Nebraska

Educators, businessmen, industrialists and statesmen are placing priority on the planning of educational programs which will prepare potential employees for skilled and technical jobs. In a letter to the late H. D. Mobley, President Johnson stated:

> "Our society's demands for new skills and upgrading of old skills have made our vocational program a front line in our total educational effort. The importance cannot be overstated, and is a must for meeting the needs of our increasingly complex economy. But it is one of our most effective weapons in the war against poverty, unemployment, and the displacement of workers by technological change."(3)

The Vocational Education Act of 1963 makes possible the planning of broadened vocational and technical education programs, and demands that these broadened preparatory programs be recognized as a vital part of our educational system.

Instructional programs that prepare persons to enter and advance in jobs should be based on the competencies required for the job. It is impractical to have a different instructional program for each job title. The structure of the labor force is changing constantly. New occupations are being created as emerging technologies develop demands for new competencies, and existing occupations become obsolete. Occupational mobility is constantly increasing, not only in terms of geographical mobility but vertically toward more demanding occupations in terms of skill and educational requirements.

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Roy D. Dillon, Associate Professor, University of Nebr., Lincoln.
James T. Horner, Professor, University of Nebr., Lincoln.

Before realistic instructional programs can be planned it is necessary to know more about the competencies people use in their work. If people in many different job titles require similar competencies, courses of study can be planned accordingly.

Relevant Research

Little concerted effort has been made to identify common competencies needed by workers across the work world. Many studies have been completed, however, in the past eight years to ascertain specific vocational employment opportunities and competencies. Studies by Phipps, et. al,(15) and Hoover, et. al.,(10) identified job competency factors that could be translated directly into major areas of instruction in agricultural education.

Recent studies in Trade and Industrial Education by Altman,(2) and Maley and Franz,(12) used the "cluster concept" to identify vocational capability areas needed by workers in a family of industrial occupations. An attempt to identify common vocational skills was made by the Dade County Public Schools.(6) They identified common communication arts competencies and fundamental mathematics, chemistry, and physics competencies for clusters of occupations such as automotive mechanics, air conditioning, refrigeration, heating mechanics, and machine shop.

In Business and Office Education, recent studies by Wanous,(20) and by Frankel,(7) present strategies for curriculum change. Chalupsky(5) used two checklists to analyze a sample of 192 office jobs. He identified four worker-function and clerical knowledge factors common to both checklists, and recommended some clear cut dimensions for classifying office occupations. These three studies indicate that courses of study for skill development

have remained relatively unchanged and that new research is being directed toward a "comprehensive" approach in Business and Office Education.

In Distributive Education, the study by Gagne[9] found a definable well-structured domain of vocational abilities which has not been previously well defined and which were not systematically taught. The content, Gagne said, was compatible with, and itimately related to, existing academic disciplines and specialized vocational training.

In the Vocational Home Economics area, Moore[14] identified six pressures that impinge on families today, while Mallory[13] described vocational home economics in terms of basic concepts and generalizations in five areas; Human Development and the Family, Home Management and Family Economics, Food and Nutrition, Textiles and Clothing, and Housing. As yet few studies have been completed relating to home economics programs designed for wage earning occupations. Two examples are studies by Roberts[17] and Riesemier,[16] who identified personal traits and skills necessary to acquire success in clothing construction jobs.

Curriculum research in technical education has also been based on specialization. Schill[18] identified common elements in the curriculum of six different specialized technician curricula, which Arnold[4] identified a core of courses whila management agreed desirable for post-high school technical programs.

The research reviewed to this point was designed to identify competency needs in specific vocational areas. Two studies in progress are broader in scope. In Kansas, Agan[2] is attempting

to determine the effectiveness of a high school course-of-study to prepare students in skills, knowledges, attitudes, understandings, and appreciations common to occupations in the fields of Agriculture, Business, Health, Home Economics, Industrial Arts, and Guidance. In Maryland, Frantz(8) is concerned with basing vocational curricula on job clusters which will be formed on the basis of the frequency with which jobs are described by common human requirement behaviors. The investigators have named three occupational clusters in the project; construction, metal forming and fabrication, and electro-mechanical installation and repair.

It is felt that persons prepared by curricula which are based upon common behavioral needs will be more competent contributors to employers than workers prepared by the more traditional method, geared for a static labor force. Persons prepared by approaches that emphasize common behavioral patterns will have an advantage in that their competencies will be more flexible.

Problem

The problem was: How to conduct a statewide inventory of the various kinds of employment, and to analyze the responses of workers regarding the knowledge and skills used in the performance of their jobs? Finally, how could the types of employment be categorized by common competency groups?

Method

An interview-questionnaire procedure was used to obtain information from a stratified random sample of 1500 employed persons between ages 21 and 69. The sample was drawn from personal property tax rolls in 14 index counties in Nebraska. Each of the 14 counties was identified by Knox,(11) as "most representative" of a group of similar counties, based upon his study of the sociological characteristics of the adult population.

The total adult population in the state between ages 21 and 69 was identified as the population for the study. According to the 1960 census, this group numbered 752,636 people. The number of adults sent questionnaires in each index county was in the same ratio to the total sample as the adult population in the group of counties represented by that index county 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 per cent of the total state population; therefore, thirty-one questionnaires (2.09 per cent of the 1500 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, and knowledges. In addition, each worker was asked to supply data concerning:

1. Major function of the business in which he was employed.

2. Prerequisites for his job, in terms of prior work experience and/or on-the-job training.

3. Educational requirement for his job.

4. Occupational category of his job, based on the categories of:

   a. Professional and managerial

   b. Clerical and sales

   c. Services

   d. Agriculture

   e. Skilled

   f. Semi-skilled

   g. Unskilled

Results

Usable questionnaires were obtained from 1315 employed persons, 1228 male and 87 female workers. This was an 87.7 per cent response. These workers represented 384 differert job titles as defined by the Dictionary of Occupational Titles, Third Edition, 1965(19). Fifty-eight per cent of 772 of the respondents were employed in a total of 44 specific D.O.T. job titles. As shown in Table 1, 441 or one-third of the workers were employed in jobs requiring the use of agricultural knowledge and skills. Although one-third were in agricultural jobs, it is interesting to note the high requirements by this group for "business competencies". There were 294 or 22.4 per cent employed in professional and managerial pursuits. Clerical and sales employees constituted 15.6 per cent or 205, while skilled workers followed closely with 182 or 13.8 per cent of the workers.

Important findings in the study pertained to areas of knowledge, and activities and duties required by the workers studied. Of the 144 different knowledges and activities or duties on which workers provided data, two areas of knowledge and nine activities or duties were checked by 50 per cent or more of the respondents. These were:

Areas of Knowledge	Activities and Duties	
Bookkeeping	Buying	Meeting farm people
Handling Money	Decision making	Meeting non-farm people
	Handling money	Operating (tools, equipment, business machines)
	Keeping records and accounts	Repairing
	Maintenance	

TABLE I

NUMBER AND PER CENT OF EMPLOYED WORKERS IN MAJOR OCCUPATIONAL GROUPS

Occupational Group	Employed Male Workers		Employed Female Workers		Total	
	No.	Per cent	No.	Per cent	No.	Per cent
Professional & Managerial	270	22.0	24	27.6	294	22.4
Clerical & Sales	167	13.6	38	43.7	205	15.6
Services	30	2.4	14	16.1	44	3.3
Agriculture	437	35.6	4	4.6	441	33.5
Skilled	180	14.7	2	2.3	182	13.8
Semi Skilled	103	8.4	3	3.4	106	8.1
Unskilled	41	3.3	2	2.3	43	3.3
Total	1228	100.0	87	100.0	1315	100.0

Twenty areas of knowledge and twenty-three activities or duties were identified as being needed by one-third or more of the workers, with seven of the forty-three items checked by 40 per cent or more of the workers. Table 2 shows the ranking of the twenty areas of knowledge and Table 3 shows the rankings of the twenty-three activities or duties, in terms of per cent of workers indicating need.

Discussion

The results indicate that persons employed in the state of Nebraska are performing many similar activities or duties and using common knowledges and skills. These data lend support for the planning of broad-based vocational courses, where persons with a variety of job titles could be educated together in the basic concepts involved. For example, a course-of-study containing basic vocational concepts within the eleven knowledges, activities, and duties used by 50 percent or more of the workers, should be a priority course in a total vocational program. Additional courses could then be planned for other job groups, still utilizing the commonality concept as shown by the competencies needed. Specific courses-of study can then be planned to enable the worker to obtain specialized skills and abilities, including an on-the-job experience program associated with the classroom program.

The local school must determine the vocational and technical education program to be provided, based upon a careful study of local,

TABLE 2

RANKING OF TWENTY AREAS OF KNOWLEDGE

BY PER CENT OF WORKERS INDICATING NEED

Rank	Area of Knowledge	Per Cent	Rank	Area of Knowledge	Per Cent
1.	Bookkeeping	51.5	11.	Livestock	35.2
2.	Handling money	50.9	12.	Farm Machinery	35.0
3.	Business management	43.0	13.	General Agriculture	35.0
4.	Taxes	39.6	14.	Welding	35.0
5.	Credit	39.5	15.	Tractor and other power	34.9
6.	Marketing	37.9	16.	Agriculture economics	34.8
7.	Soils	37.5	17.	Inventorying	34.8
8.	Electricity	36.9	18.	Salesmanship	34.8
9.	Insurance	36.8	19.	First Aid	34.4
10.	Accounting	36.5	20.	Mechanics (tractor)	34.2

TABLE 3

RANKING OF TWENTY-THREE ACTIVITIES OR DUTIES

BY PER CENT OF WORKERS INDICATING NEED

Rank	Activity or Duty	Per Cent	Rank	Activity or Duty	Per Cent
1.	Decision making	71.3	12.	Filing, Inventorying	41.7
2.	Keeping records	65.4	13.	Handling employees	41.1
3.	Meeting non-farm people	63.8	14.	Service	40.9
4.	Operating tools, equipment and business machines	58.6	15.	Appraising the work of others	39.8
5.	Meeting farm people	55.7	16.	Consultation	39.6
6.	Handling money	54.7	17.	Supervising	39.1
7.	Repairing	53.5	18.	Mixing	38.6
8.	Maintenance	50.8	19.	Inspecting	37.3
9.	Buying	50.2	20.	Planning Production and Service	37.3
10.	Selling	49.1	21.	Building	35.8
11.	Adjusting	44.6	22.	Training others	35.1
			23.	Assembling	34.3

area, state and national occupational needs. The local school must also plan the course sequence and determine their best qualified staff members to teach the various phase of the common competencies courses. It is felt that an inter-disciplinary approach might be taken in the basic vocational courses, utilizing team teaching, with teachers crossing subject-matter areas to utilize their special strengths.

Summary

In an effort to determine competencies and activities used by workers in a cross-section of the statewide labor force, data were obtained from a random sample, 1315 employed persons, on the county assessor's tax rolls. Each worker responded to a checklist of 144 activities, duties and areas of knowledge used in his job. Additional data were obtained on the function of the business in which the workers were employed, prerequisites of their jobs, and educational requirements for their jobs.

Three hundred eighty-four different job titles were defined for the 1315 respondents, using the Dictionary of Occupational Titles, Third Edition, 1965. When placed in a major occupational group, based upon their major job requirements, 33.5 per cent were in agricultural jobs on and off-the-farm, 22.4 per cent in professional and managerial jobs, 15.6 per cent were in clerical and sales, 13.8 per cent were in services, and 3.3 per cent in unskilled jobs. A total of 826 or 62.9 per cent of the workers said they required a high school diploma or higher for their jobs, and 70.1 per cent of the respondents indicated their job requirements included prior work experience, on-the-job training, or a combination of the two.

Most important from the study were the findings concerning activities and knowledges needed by workers. Of the 144 activities and knowledge areas on the checklist, eleven were checked as used by more than 50 per cent of the respondents. These results can be translated into major components of a priority course(s) in a total vocational education program. There were five items checked by more than 40 per cent of the workers, and twenty-seven items checked by 33 per cent or more of the workers. These groups of activities and areas of knowledge are viewed as common components and as a base for vocational course construction.

This research strongly supports the planning of broad vocational courses that stress basic concepts, in which persons in many different job titles, but with common educational needs, may be prepared together. The local school must carefully examine local, area, state, and regional data pertaining to employment needs and competencies required by workers, and plan a vocational program which will utilize staff to teach that which they are best qualified to teach. The most likely outcome of this curriculum planning approach will be an inter-disciplinary approach, across vocational subject areas in the basic courses, with persons moving into specialized vocational courses for the more specific and advanced competencies required.

Note to Editor: Underline indicated italics.

REFERENCES

1. Agan, R. J., "Paola Pilot Project in Inter-disciplinary Vocational Education", Manhattan: Kansas State University, Study in Progress, 1967.

2. Altman, James W., "General Vocational Capabilities (Skills and Knowledges)". Paper presented at American Educational Research Association Meeting, Chicago, February, 1966.

3. American Vocational Association, American Vocational Journal, 1964, 39, 36.

4. Arnold, Joseph P., A Study of Recommendations for Technical Education Curricula. A report on Project Number S-196 to the U.S. Office of Education. Lafayette: Purdue University, 1965.

5. Chalupsky, A. B., Comparative Factor Analysis of Clerical Jobs, Thesis, Ph. D., Indiana: Purdue University, 1954.

6. Dade County Public Schools, A Partial List of Competencies in the Areas of the Communication Arts, Mathematics, and the Physical Sciences Required of Students Enrolled in Vocational Education Programs atthe Secondary School Level,Florida: Miami, Division of Vocational, Technical and Adult Education, 1965.

7. Frankel, Moe L., Achieving Curriculum Change Through Economic Education: A Field Study of Selected Schools, Thesis, Ed. D., New Brunswick: Rutgers University, 1958.

8. Frantz, N. R., Jr., "The Cluster Concept as a Program in Vocational Education at the Secondary School Level", Paper presented at a conference on research in vocational and technical education, Madison: University of Wisconsin, 1966.

9. Gagne, Robert M., et. al., Research on General Vocational Capabilities, Final Report of a Study, Pittsburg: Institute of Performance Technology, American Institute for Research, March, 1966.

10. Hoover, Norman K., McClay, David R., and Stevens, Glenn Z., Off-Farm Agricultural Occupations in Pennsylvania: Employment Opportunities and Technical Education Needs, University Park: Pennsylvania State University, Department of Agricultural Education, 1966.

11. Knox, Alan B., Base Study of Adult Participation in Nebraska, Lincoln: University of Nebraska, Office of Adult Education Research, 1964.

12. Maley, Donald, and Frantz, Nevin R., An Investigation and Development of the Cluster Concept as a Program in Vocational Education at the Secondary School Level, College Park: University of Maryland; 1965.

13. Mallory, Bernice, "Curriculum Developments", The Bulletin of the National Association of Secondary School Principals, 1964, 48, 51-65.

14. Moore, Bernice M., "Families in America, Variations on a Theme," Bulletin of the National Association of Secondary-School Principals, 1964, 48, 3-14.

15. Phipps, Lloyd J., et. al., Technical Education in and for Rural Areas: Technicians and Other Workers Who Need Technical Knowledge, Urbana: University of Illinois, Vocational and Technical Education Department, Report No.1, 1964.

16. Riesemier, Thelma M., A Home Economics Curriculum Study in the Field of Clothing for an Area Vocational-Technical School in Kansas, Thesis, M. S., Manhattan: Kansas State University, 1965.

17. Roberts, Roy W., Determining Kinds of Gainful Employment in Which Former Homemaking Students from Arkansas Secondary Schools Engage and What Knowledge and Skills Homemaking Curriculums May Contribute to These Gainful Occupations, Fayetteville: University of Arkansas, 1966.

18. Schill, William J., and Arnold, Joseph P., Curricula Content for Six Technologies, Urbana: University of Illinois, Bureau of Educational Research and the Department of Vocational and Technical Education, 1965.

19. U. S. Department of Labor, Dictionary of Occupational Titles, Third Edition, Vol 1, Washington: Government Printing Office, 1965.

20. Wanous, S. J., "An Evaluation of Curriculum Practices and Trends in Business Education". Recent and Projected Development Affecting Business Education, Yearbook, 1964, Washington: National Business Education Association, 1964.