

## A Significant Role In American Education

Bruce W. Emanuel

### Abstract

*This article discusses the beginning of technical education in America and also clarifies our understandings of the goals and purposes of technical education in agriculture. At a time when taxpayers, parents, and even students seem to be disillusioned about education, statistics show increased enrollment in postsecondary agricultural education. This paper attempts to convey concepts to the classroom teacher as well as to define and clarify the historical background, emergence, present status, and direction of postsecondary technical education in agriculture.*

As educators, it is important that we find time to reflect about the heritage of our discipline. Without the dedication of pioneers in technical education, we would not be in the generally favorable position that most of us find ourselves in today's technical colleges.

### What Is a Technical College?

One of the first definitive studies of postsecondary technical education in the United States was published in 1931. Commonly referred to as the Wickenden-Spahr Report, (Wickenden and Spahr, 1931), it summarized the characteristics of a technical college as follows:

1. It is a school of postsecondary character, but distinct in character from a university.
2. Its purpose is to train men and women for callings and functions which occupy an area between the skilled crafts and the highly scientific professions.
3. It offers training both for technical pursuits, concerned with planning and control, and for supervisory pursuits, concerned with operation and maintenance.
4. Being intensive in purpose, its courses are shorter in duration than those of the professional colleges. They are essentially terminal rather than preparatory courses.
5. Its methods of teaching are relatively direct, with a strong emphasis on doing as distinct from book study.
6. Its teachers, while possessing scholarly preparation, are chosen primarily on the basis of practical experience and ability to teach through programs of orderly experience.
7. Its entire scheme of instruction follows much more closely the actual usage of industry than that of professional schools.

Thus the technical college is neither a technical high school nor a four-year college. High school graduation is required for entrance, and some background in mathematics and science are typical prerequisites for technological courses. On the other hand, the programs of instruction are briefer and usually more completely technical in content than professional curricula.

### Changing Scope of Education

There was little need for formal technical education in the early years of our country. Farmers and craftsmen

learned their skills by apprenticeship, and scientists were educated abroad.

The total population rose from about 3.9 million in 1790 to slightly more than 46 million in 1876. The ratio between rural and urban population in 1790 was about 18 to 1; by 1880 this ratio had changed to 3 to 1. All of these changes affected education, and the number of students in school rose yearly. As student numbers increased, the typical classical education did not satisfy those students who were interested in practical training. What appeared most appropriate to many persons was a middle ground in secondary level education where the classical and the practical each played a role.

A changing economy and the needs of the country during the Civil War crystallized thought and action concerning uses of technical manpower. The result was federal legislation in the form of the Morrill Act of 1862, which established the land grant colleges of engineering and agriculture. In 1890 the second Morrill Act increased federal funds for support of land grant colleges.

### Technical Education Emerges

Wickenden and Spahr identify the Lyceum established at Gardiner, Maine, in 1822 as the first technical institute in the United States (Wickenden and Spahr, 1931). Most of the early institutions which could be identified as technical colleges have long since passed from the picture. Each one grew up around some person or local situation, with no sense of solidarity. As situations changed, these forerunners of the modern technical college often dissolved. While in operation, however, they geared their instruction to the maturing technology of the time, emphasizing application with intensive instruction during short periods of less than four years.

A few have continued to operate to the present. Among these are the Ohio College of Applied Science, the Spring Garden Institute, the Milwaukee School of Engineering, and the Franklin Institute of Boston. A large number of those which have continued to the present abandoned the objective for which they were founded and initiated four-year bachelor degree curricula in engineering and science. Among such schools are Pratt Institute, Drexel Institute, Brooklyn Polytechnic Institute, Carnegie Institute of Technology, and Bradley University (Graney, 1964).

The first technical program in agriculture was started in 1893 by the University of Massachusetts, but closed due to lack of support. Re-established in 1906, it was officially designated the Stockbridge School of Agriculture by the Massachusetts legislature in 1918. The University of New Hampshire in 1895 started a two-year curriculum. However, it was not formally recognized until 1939 when it became the Thompson School of Applied

Bruce W. Emanuel is a professor in the Animal Husbandry Department, Agricultural and Technical College, Cobleskill, NY.

Science. In 1901 Joliet Junior College was the first such institution to offer agriculture in Illinois. Also important is this early picture are New York State's six agricultural and technical colleges, which began over 60 years ago. Cobleskill, for instance, was established by an act of the New York state legislature in 1911, and opened its first class in 1916.

### Need for Technical Programs

During the early history of our country we were an agricultural nation, with 9 out of 10 Americans working on farms to produce food and fibers. However, by 1900 we had reached the age of industrialism, when a majority of the labor force was freed to work in industrial production. By 1955 we became the first major nation where white collar workers equaled the number of blue collar workers. In 1976 there are two white collar workers for every blue collar worker. The most significant aspect of this transition in the labor force is the increasing importance of technical and professional people.

Of the major occupations requiring special training, occupations as technicians increased 100 percent during the 1950's, while all others increased by only 50 percent.

For the purposes of this paper, we will use the definition of technicians as given by the National Science Foundation (Report, 1964): "all persons engaged in work requiring knowledge of physical, life, engineering, and mathematical sciences comparable to knowledge acquired through technical institutes, junior college, or other formal post-high school training, or through equivalent on-the-job training or experience." A technician is a worker whose education combines skills of the craftsman and enough of the theory of the professional so that he can provide close support to the professional in making practical applications of new scientific and technological ideas.

Unskilled workers and university graduates cannot fill demands at all work levels in our society. Providing baccalaureate degree programs for all occupations is not essential and not desirable. Many job classifications do not require four-year college graduates or people with university training. There are positions requiring a technical education which could be entered by people with baccalaureate degrees; however, these people could become dissatisfied because they would not be utilizing their entire education. The training of a technical student consists of a specific curriculum to teach skills and theory needed in technical positions. Training for a baccalaureate degree, however, is often quite different, and these graduates are simply not prepared for the job of a technician. Placement officers in institutions now offering technical education indicate there are more technical jobs available than there are people trained to fill the jobs.

### History of Federal Support

The 1917 Smith-Hughes Vocational Education Act was enacted to meet the demands of an economy just reaching industrial maturity. Allotments went to voca-

tional agriculture and home economics, as well as training in trades and industry for secondary school youth.

The 1946 George-Barden Act was introduced to meet changes in labor force demands over the previous thirty years. Funds for vocational education were increased and support was added for the distributive occupations. Ten years later two new categories were added — training in the fishery trades and practical nurse training.

The need for training highly skilled technicians was recognized and supported by Federal legislation under Title VIII of the National Defense Education Act of 1958.

Recognizing the growing importance of educating all persons for gainful employment, Congress enacted the Vocational Education Act of 1963, which provided substantially increased funds for vocational and technical education to serve greater numbers of people of all ages. Research funds for vocational and technical education were, for the first time, authorized by the Congress under this act. In addition to the acts discussed above, Congress enacted the Higher Education Facilities Act of 1963, authorizing \$1.2 billion for construction of facilities for public and non private colleges.

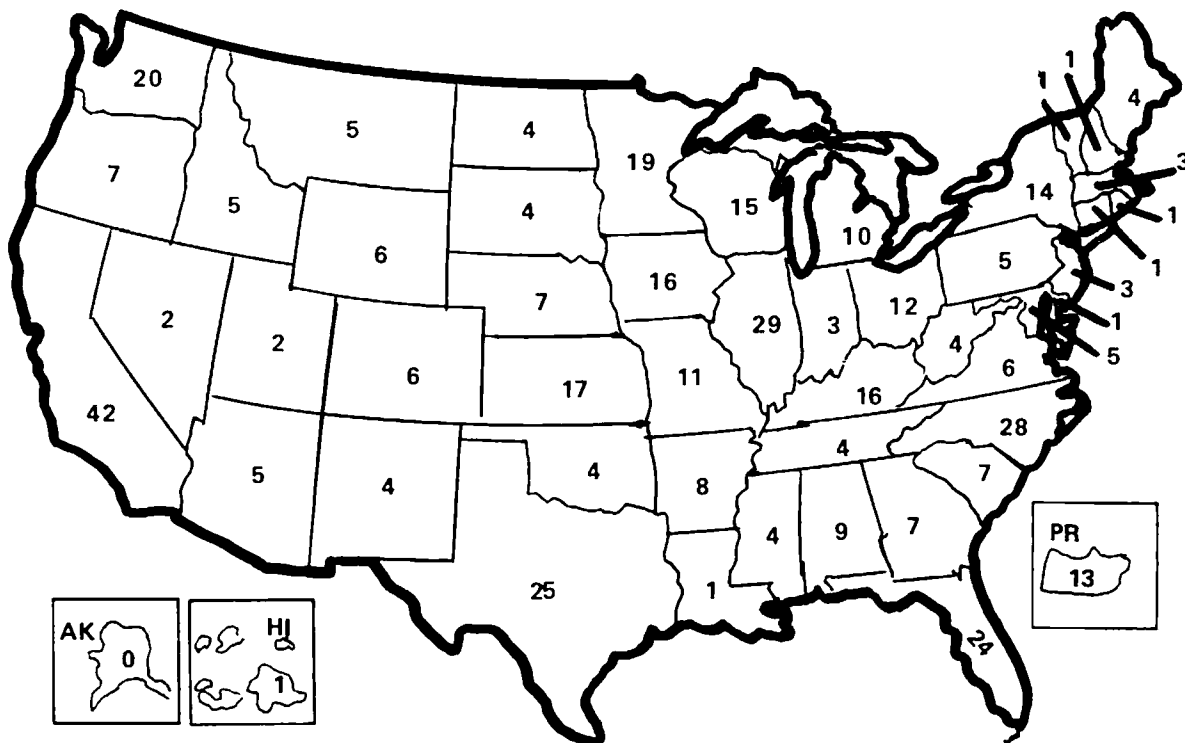
The Vocational Education Amendment of 1968 increased appropriations to a maximum of \$565 million for the fiscal year 1973 and each succeeding fiscal year. Under Title I of the act, 22 percent in grants is specifically for construction of facilities for public community colleges and public technical institutes which meet the requirements specified by the act. This clearly indicates the importance attached by the Congress to improved facilities for institutions which offer programs to train highly skilled technicians. Many of the programs in agriculture were promoted and supported under the broad umbrella of vocational education, with criteria set by Congress.

As an example of the recent growth of technical programs in the United States, the following table shows the development of postsecondary education programs in agriculture and natural resources since 1966.

	1966	1967	1968	1975	1976
No. Institutions Offering	142	197	243	441	451
No. Curriculums Offered	385	500	608	1,334	1,467
No. Full-Time Faculty Teaching	393	527	716	1,572	1,749
No. Part-Time Faculty Teaching	444	579	743	1,118	1,171
No. Students Enrolled	10,290	13,786	18,434	54,428	71,067

Detailed information on current programs in postsecondary education in agriculture, agribusiness, natural resources, and environmental occupations of less than the baccalaureate degree has been compiled in chart form by Dr. Larry Erpelding, Ohio State University, in cooperation with the U.S. Office of Education (Erpelding, 1976). These data were the basis for the map in Figure 1, showing the distribution of postsecondary programs throughout the United States. Forty nine states and 1 territory offer this training, in numbers ranging from 42 programs in California to 1 in several of the

Figure 1. 451 POST-SECONDARY TECHNICAL/COMMUNITY INSTITUTIONS IN 1976, BY STATES



smaller states. Both technical colleges and community colleges offer courses in one or more of the study areas, all of which are sometimes referred to as "agriculture" or "agribusiness."

### Current Studies

For many years, those conducting formal education and manpower training programs have needed to know more about the various occupational sectors of the nation's economy. In the mid-1960's, a National Committee on Employment Opportunities and Training Needs in Agribusiness was established. In 1972 the committee formulated the National Agribusiness Manpower Project, a long-range three-phase program encompassing all agricultural areas.

Phase I involves the identification of occupations requiring or utilizing agribusiness competencies, and the extraction of corresponding manpower data from the 1970 census tabulations. Results of the information gained from a study of over 90,000 industry-occupational cross-classifications were published in August 1974 (*Employment*, 1974).

Phase II, currently being researched, will project the employment opportunities and training needs in occupations requiring agribusiness competencies, in cooperation with the U.S. Department of Labor manpower data system.

Phase III will develop methods for integrating the agribusiness manpower data into existing systems of data

collection and analysis, to keep information current. Special studies will be made of new occupations in various industries, and results will be reported to the national committee.

The results of these programs will identify current and future agribusiness job opportunities for national and state areas, and also identify skills, competencies, and training needed for current and future employment in agriculture and natural resource occupations. Technical educators can use this information in formulating curricula to train students in areas of greatest job opportunities for the future.

### The Technical College and the Future

It is likely that the technical college will continue to enroll increasingly larger numbers of students. In addition to the national increase in total number of college students, demand for technicians in industry and agriculture is rising. The depressed job market has encouraged many young people to turn to specialized training in fields for which there is a demand for personnel. Increasingly the trained technician finds himself in high demand by employers.

At the same time, the technical college is gaining increased respect as an educational institution. The four-year college no longer holds a monopoly on "status" in higher education. Not bound by tradition, status, or degree consciousness, the technical college has exhibited

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flexibility and used innovative techniques to provide meaningful training for a pragmatic world. Occupational work is becoming increasingly specialized. This tremendous national need for trained manpower is one of our strongest bases for the future.

Technical education, with its hands-on, practical approach, can bring relevancy to the occupational goals of modern youth. Perhaps the key concept is developing, through both theory and laboratory experience, the motivation to learn. It must be clearly understood that technical programs involve the social and biological sciences as well as communications skills, if we are going to meet the overall objectives and philosophy of this movement.

An important area of concern is the high rate of unemployment among unskilled youth. We need to develop a partnership between students, parents, labor, business, communities, and the technical school. Technical education is not restricted to community needs, but encompasses state and national involvement. New goals must evolve that relate technical education to work. With increased competition for job advancement, training for updated and advanced skills is more important than ever before.

In agriculture, technical education is making an important contribution toward fulfilling the basic needs of mankind. The June 1975 issue of the *NACTA Journal*, devoted to the world food shortage, emphasized the ever

increasing demands for food and fiber. To meet these demands, it is imperative that more skilled technicians be trained to work in this discipline.

## References

- Barlow, M. "200 Years of Vocational Education." *American Vocational Journal*, May 1976.
- Bogue, Jesse Parker. *The Community College*. McGraw-Hill Book Company, New York (1950).
- Bureau of Labor Statistics Bulletin 1512 (1966).
- Criteria, Evaluation, and Statewide Planning for Technical Education Programs*. Report of National Clinic on Technical Education Programs (1966).
- Employment in Agricultural and Agribusiness Occupations*. U.S. Department of Agriculture, Washington, D.C. (1974).
- Erpelding, Larry H. *1976 Directory of Two-Year Programs in Post-Secondary Education in Agriculture, Agribusiness, Natural Resources, Environmental Occupations*. U.S. Department of Health, Education and Welfare, Washington, D.C. (1976).
- Foncannon, Howard F. *Technical Education in American Higher Education*. Paper presented at National Clinic on Higher Education (1969).
- Graney, Maurice R. *The Technical Institute*. The Center for Applied Research in Education, New York (1964).
- Tewksbury, D.G. *The Founding of American Colleges and Universities Before the Civil War*. Bureau of Publications, Teachers College, Columbia University, New York (1932).
- Wickendon, W.E. and Spahr, R.H. *A Study of Technical Institutes*. Society for the Promotion of Engineering Education, Lancaster, Pa. (1931).
- Report of a National Seminar on Agricultural Education. Ohio State University (1964).