

THE EMERGING ROLE OF STATE UNIVERSITIES

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Introduction

An invitation to speak before the American Institute of Cooperation, Colorado State University on the emerging role of state universities presented a challenge to the author to provide a representative view on a national scale of the role of state universities in agribusiness extension, teaching and research. I assumed my assignment was to consider non-land grant colleges and universities offering baccalaureate and graduate degrees. A preliminary review of available printed materials provided extensive background on land grant programs and no material on the non-land grant agricultural programs.

To obtain information, I sent a letter to public and private state colleges and universities in 22 states assumed to be offering agricultural programs. My remarks will center on the information received from respondents. Their help in providing me with information is greatly appreciated. An attempt will be made to contrast the scope of programs involved but no effort will be made to provide a statistical summary of all state college and university programs. This review will consider teaching, research and extension programs.

A brief review of university agricultural programs in Wisconsin seems in order. Two public university systems, the University of Wisconsin system which enrolled 59,756 students in the fall of 1970 and the Wisconsin State University system which enrolled 61,363 students in the fall of 1970, offer all B.S. and graduate degrees in agriculture. All agriculture degrees awarded by the University of Wisconsin system are given from the land grant campus at Madison, while two branches of the Wisconsin State University system offer degrees at WSU-River Falls and WSU-Platteville. Enrollment growth in agricultural programs has been significant on all three campuses in the last decade. The Governor of Wisconsin has proposed a merger of the two university systems.

Teaching Programs

A distinguishing feature of state university agricultural programs has been the strong emphasis on classroom teaching. The primary responsibility of state university faculty has been class instruction. Four areas relating to the teaching program will be considered: (1) Enrollment, (2) Programs, (3) Staff, and (4) Placement.

Enrollment

Enrollment growth has been substantial in the majority of public state university programs. Southern Illinois University at Carbondale, Illinois provides a classic example. Fall quarter agricultural enrollment was 105 in 1951-52, 568 in 1961-62, and 952 in 1970-71. An important growth element of the Southern Illinois program has been in Forestry with 392 students last fall. The State College System in California has 19 state colleges of which four offer programs in agriculture. Cal Poly at San Luis Obispo is the largest of the four and has the largest agricultural program in the West. Last fall enrollment was 2,378 students. For the last ten years, enrollment growth has consistently been between 6 and 8 percent. Another example of rapid enrollment growth is Texas Tech University at Lubbock, Texas. Undergraduate enrollment increased from 736 in 1960 to 1,204 in the Fall of 1970.

A representative number of agricultural majors in public state universities is 300-500. Within states, where state college or university systems have developed, such as Wisconsin, Illinois, Missouri and others, the majority of undergraduate agricultural majors are enrolled in these systems.

The private colleges offer very limited agricultural programs. At Andrews University in Berrien Springs, Michigan about 15 students major in agriculture. This enrollment is comparable with 10 years ago. The Board of Trustees at Union College in Lincoln, Nebraska has voted this year to completely eliminate the minimal agricultural program. McPherson College in McPherson, Kansas is one of six colleges associated with the Church of

the Brethren and is the only one that offers agriculture. There is strong feeling that the one man department should be maintained and upgraded if this becomes feasible.

An exception to the limited enrollment patterns in private colleges with agricultural programs is Brigham Young University at Provo, Utah. Enrollment in agricultural programs has increased from 181 majors in the Fall of 1960 to 370 majors in the Spring of 1971.

Programs

Program growth has been significant in the last ten years at public state colleges and universities. The earlier programs were usually limited to general agriculture. In the last decade developments include the addition of B.S. programs in traditional disciplines of animal and dairy science, agricultural engineering, agronomy, and agricultural economics. Particularly noteworthy has been the national emphasis on agribusiness or agricultural business management degrees with course work including accounting, finance, and computer science along with the more traditional emphasis on production agriculture. Another emphasis area in public state universities has been natural resource management and forestry. An example of this is the resource management major at WSU-River Falls.

The initial agricultural education program at WSU-Platteville was started in 1914 with the first degree in 1928. The first non-teaching B.S. was started in 1958. In the last decade, five additional under-graduate majors and two M.S. programs have been initiated. The first M.S. degree was offered in Agricultural Education. The second M.S., Agricultural Industries, was initiated in the Fall of 1969 as an inter-disciplinary program. The industry-oriented program has a core of courses required of all students along with an elective option. The core courses include work in marketing, management, computer applications, sales, personnel and research procedures. Elective options are available in animal science, soil and crop science, agricultural economics and business-economics. Industry surveys have provided support for the dual nature of the program.

Graduate programs at the M.S. level are limited at most state colleges and universities. Graduate courses, usually at night, are frequently carried in conjunction with full-time employment in many of the recently started M.S. programs. Survey data do indicate additional interest and growth in graduate programs. For example, Southern Illinois University, M.S. offerings include degrees offered in four departments with 93 agricultural major graduates in 1970-71. Graduate enrollment at Texas Tech increased from 28 in 1960 to 120 in 1969. Texas Tech has recently initiated Ph.D. programs in Animal Science, Agricultural Economics and Range Management. Seven M.S. program options are now offered at Brigham Young University with additional plans for the M.S. in Agribusiness. However, only eleven M.S. degrees have been earned since 1960.

A sharp contrast is apparent between the public state university and private college programs. Berea College in Berea, Kentucky with a long history of interracial education provides an excellent example of a private college relating to regional needs. Berea College draws 80 percent of its students from 230 southern Appalachian counties. It has a total enrollment of about 1400 students who pay no tuition and attend the college for about \$750 per year which primarily goes for room and board. Berea College has a required labor program in which every student works a minimum of 10 hours per week and is paid a minimum of 65 cents an hour. Almost half of the agricultural graduates, numbering about 20 per year, return to the Appalachian area in public service employment in extension, Soil Conservation Service, Farmers Home Administration and vocational agriculture. Many later move from these jobs to business including several of the agricultural cooperatives in the area. The other half of the graduates continue to graduate school in land grant universities of Southeastern United States.

The School of the Ozarks at Point Lookout, Missouri provides another example of a private college offering an opportunity to attend college to students from poor families that can't afford other colleges. Each student works 20 hours per week throughout the entire year to earn board, room and tuition. The recently started agricultural program is expected to include four staff members at the end of 1972.

Part-time employment throughout their collegiate programs is essential for many college students attending state universities. In addition to school year work-study programs supported by federal, state and private money, an increasing number of summer intern programs are being developed.

Each of the agricultural colleges in Wisconsin has a summer intern program. The WSU-Platteville program includes 37 students this summer. The 12-week program generally includes students between their junior and senior year. The student can earn up to six credits and is paid by the employer between \$125 and \$175 per week. The range of employment includes state and federal agencies, seed corn companies, regional and local cooperatives, livestock management, vegetable processors, feed companies, farm machinery firms, dairy processors and other businesses. The program has been well received by companies and students.

The agricultural business management program at Cal Poly in San Luis Obispo includes a one-week apprenticeship program as well as a 12-week internship program. During the 12-week period, students move throughout the company in order to get an insight into various operations. The students do not receive pay but earn 12 credits.

Staff

Staff additions are closely related to program and enrollment growth. The staff at many state colleges and universities in previous years consisted of teachers with most of their undergraduate and graduate work in agricultural education. Individual staff teaching responsibilities varied from animal science to agricultural mechanics to farm management. The technological revolution in agriculture now complicates effective instruction in multiple disciplines.

The agricultural staff additions at Western Kentucky University at Bowling Green, Kentucky within the past five years demonstrate the academic background. Six faculty members, each having completed the Ph.D. and each from a different land grant university, have joined the faculty.

The entire teaching faculty in the College of Agriculture at WSU-Platteville has completed the Ph.D. A combination of farming, industry and research backgrounds strengthen their teaching ability. One of our faculty members was on the staff of a large land grant university for 10 years with primary responsibility in research and extension. His prime interest in classroom teaching was a motivating factor in accepting employment at Platteville. Another was employed by a large feed manufacturer before joining the faculty. State college and university faculties accept their employment because of personal interests in classroom teaching.

Placement

Placement information received from state colleges and universities indicates a strong demand for graduates. The campus turmoil which has erupted on many large campuses has encouraged some companies to recruit additionally on smaller campuses. As an example of the placement record, all but one or two of the 69 agricultural graduates at Northwest Missouri State College at Maryville, Missouri were employed in early June.

In early June a national meat packer which has hired many WSU-Platteville graduates called regarding their current need for 10 additional men. Industry contacts continue to result in greater demand for graduates than our program provides. Less than five percent of WSU-Platteville's June agricultural graduates haven't accepted jobs. The farmer cooperatives are also an important element of the demand for college graduates. Marketing and management responsibilities are particularly favorable areas of employment demand.

The employment situation in the agricultural industries offers a sharp contrast with many other areas of domestic employment. National surveys and professional counselors often fail to consider farm and off-farm agribusiness employment opportunities. We applaud efforts by farmers' cooperatives to develop a better understanding of this situation.

Research

The research program at state colleges and universities is in most cases very limited. However, the contrast between state universities is significant and ranges from no research to extensive programs. Research is directly linked to faculty, facilities and graduate programs. The addition of staff in the last decade with research degrees has encouraged research. The addition of new laboratories often provides facilities for both instructional and research programs. Classroom responsibilities in 3-5 separate classes each term have severely restricted staff time for research. An exception to this pattern occurs at Southern Illinois University where most staff members are on a 50-50 teaching-research appointment. The more usual pattern is that staff members are not provided release time for research work.

The orientation at most state universities has been toward applied research involving seniors and graduate students. In some cases, credit is earned for independent study or research carried on under the supervision of the staff. The senior project of Cal Poly at San Luis Obispo is a program where students select a problem, analyze it and come up with recommendations. These projects have included feed trials, variety trials, pesticide studies, design and construction of equipment and farm analysis. A newly initiated M.S. program in plant sciences at Chico State College in Chico, California is expected to increase research.

The scarcity of available funds for research has encouraged staff members to explore research interests of business firms. Staff members at WSU-Platteville, directing graduate projects, have acquired research monies from farm credit agencies, pharmaceutical companies and farm cooperatives. Research contracts at Southern Illinois University include the U.S.D.A. as well as private firms.

The expansion of agricultural research at Texas Tech University during the past ten years represents a notable contrast with most state universities. Research projects, numbering about 40, received approximately \$60,000 of financial support in 1960. Approximately \$1.7 million derived from direct state appropriations and from private, federal and local sources were expended in 1969-70 on 261 research investigations. Texas Tech University has also been involved in positive steps to implement cooperative research programs with other state colleges and universities. For example, a cooperative research program has developed with Texas A & M University. Other separate joint research projects have developed with West Texas State University and Abilene Christian College.

In Wisconsin, the College of Agricultural and Life Sciences at the University of Wisconsin has provided financial support on joint research projects. Staff members in animal science, agronomy and agricultural economics in the Wisconsin State University System have worked with University of Wisconsin research staff. The Coordinating Council of Higher Education in Wisconsin has recommended to the State legislature that \$75,000 be appropriated for research projects involving staff personnel of both systems. Staff cooperation in developing these research proposals as well as previously completed research has been excellent and provide a positive example of coordination between state universities and a land grant university.

Extension

Extension programs offered by state colleges and universities are very limited and generally restricted to farmers rather than non-farm agribusiness firms. The Cooperative Extension Service program includes county and land grant university staff appointments. Informal work with individual farmers by staff personnel best characterize the extension program. The interest in area

farmer problems by staff members is a natural outgrowth of professional concern outside the classroom. As an example, staff members at Northwestern State University at Natchitoches, Louisiana give advice only to local farmers that request assistance.

Interest by state university staff members in dissemination of research results has encouraged extension programs for farmers. Considerable liaison is also apparent between staff personnel and high school vocational agriculture and F.F.A. programs. Extension courses and conferences are also being initiated at several larger state universities. The need for effective coordination between public institutions is readily apparent. In Wisconsin, extension-type programs are offered by the State University System, the Area Vocational Schools (which represent a separate system) as well as the primary program offered through University Extension of the University of Wisconsin System. Dr. Gary Rohde of WSU-River Falls and I have accepted 10 percent extension marketing appointments with University of Wisconsin Extension starting July 1, 1971. The extension appointments as well as continuing research exemplifies the willingness of the University of Wisconsin to recognize and work with the State Universities.

Summary and Conclusions

The historical and current emphasis in state college and university programs has been and is on undergraduate teaching. Program growth and enrollment patterns reflect the emergence of

state universities. Research has been closely linked to senior study and graduate programs. Extension developments to date are limited.

State university program growth and respectability is a matter of record in many states. The scope of programs attempted has sometimes been greater than budget and staff. The positive historical role of land grant universities is also a matter of record. Frequently, the printed media and other media only recognize the teaching and other programs of land grant universities. Career information brochures and some films suggest that only land grant universities exist.

The relationship between land grant universities and state universities is critical. Too frequently, the relationship has been troubled with the result being mutual avoidance. The research and educational needs of a progressive agricultural industry require more meaningful cooperation in every state where dual educational systems exist. Educational accountability and responsibility demand this cooperation.

Much progress has been made in the past 15 years toward this greater cooperation, but much more needs to be done in order to achieve full use of monies, facilities and personnel in fulfilling the goals of higher agricultural education.

"Adapted from a speech presented at the American Institute of Cooperation, Colorado State University, August 1971 by John Cottingham; Head, Department of Agricultural Industries, Wisconsin State University-Platteville, Platteville, Wisconsin.

A BEHAVIORAL OBJECTIVE-CENTERED APPROACH TO TEACHING

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INTRODUCTION

Recent emphasis on the use of behavioral objectives in teaching prompted the author to experiment with a behavioral objective-centered teaching method, wherein student learning activities were totally directed by stated behavioral objectives. The method was used in teaching a sophomore-junior level course in Dairy Products Technology.

The primary goal in experimenting with the behavioral objective-centered approach was to promote greater student participation in class discussion. Attempts to promote meaningful discussion in previous courses were generally ineffective. Students commonly were not prepared, and discussions soon became one-sided or "pseudo-lecture" presentations. A means of encouraging students to come to class prepared for discussion was needed.

Several secondary goals evolved as the method was developed. These included promotion of greater student responsibility in the learning process, reduction of emphasis on "material" to be covered, and reduction of proportion of teaching by the lecture method.

The prominent role of behavioral objectives in the method was the result of a belief in their value in communicating expectations to students.

Additional assumptions were 1) that learning occurs outside the classroom and 2) that students were willing to try different approaches to learning.

BEHAVIORAL OBJECTIVE-CENTERED METHOD

Lists of behavioral objectives and appropriate references were provided to students on a weekly basis. Each set of objectives was restricted to the specific topic of discussion for the week. An example of one week's set of objectives is shown in Table 1.

Objectives were stated behaviorally, that is, in terms of how the student must demonstrate successful mastery of the objectives. Books by Mager¹ and Popham and Baker² were consulted for information relative to the wording of behavioral objectives.

The class schedule was rearranged from three 50-minute periods to a single 80-minute session per week. The students' responsibilities during the week between successive class meetings were to master the stated objectives. Reorganization of the class schedule was based on the assumption that time spent searching out and organizing material would result in learning at least equal to that which occurs during lecture presentations.

Weekly class meetings began with a 15-20 minute quiz, followed by directed class discussion. The weekly quiz was adopted at the suggestion of students to provide incentive to come to class prepared for discussion. Class discussion was directed along the lines of the behavioral objectives, but frequently went beyond these limits.

The laboratory portion of the course supplemented the weekly assignments with appropriate resource material, such as slides, demonstrations, observation of pilot plant operations or field trips.

The final examination consisted entirely of problem solving or situation-response type questions, requiring application of knowledge gained during the semester. One-half of the examination was written, and the other half was an individualized, oral examination.

Student performance was evaluated on the basis of weekly quizzes (40%), class discussion (20%), laboratory (20%), and final examination (20%, equally divided between oral and written portions).

RESULTS AND DISCUSSION

Student Performance

Grade point averages (GPA) of students entering the course ranged from 1.96-3.76 on a 4.0 scale, with a mean GPA of 3.02. Course grades earned by students ranged from 2.5-4.0, with a mean of 3.63. Grades earned were generally higher than the students' cumulative grade averages, and were higher than grades earned by other students in previous sections of the course.