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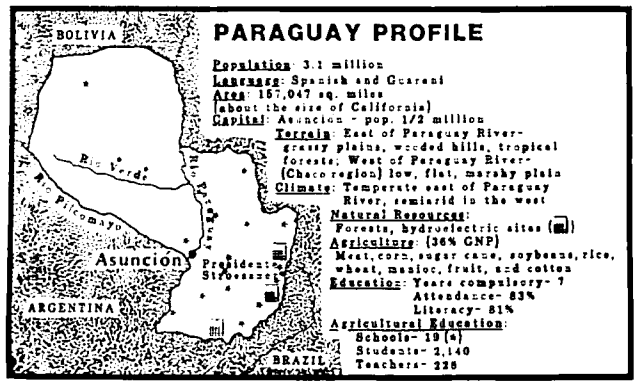
Agricultural Education in Paraguay

Richard Welton, Victor Arrua, Anibol Fanego and Louis Spezzini

Paraguay is a South American paradox in some ways. It is a landlocked country which will soon become the largest exporter of hydro-electric power in the world. A close examination of the geography of Paraguay reveals that it has two distinct topographical regions which are divided by the Paraguay River. The origin of the river is in the northern part of Brazil and flows into the Atlantic Ocean with the La Plata River near Buenos Aires. Ninety percent of the population of Paraguay lives in the eastern part of the country. Tropical forests, gently rolling wooded hills, and fertile grassy plains abound in this region. The climate is sub-tropical with an average rainfall of 1200 to 1800 millimeters (48-72 inches). The western part of Paraguay, known as the Chaco Boreal, is covered with dense scrub forests and marshes. Only five percent of the country's population live in this region. Here the rainfall averages about 600 to 700 millimeters (24-36 inches) yearly. Temperatures in the Chaco are much hotter than in the eastern part of the country.

The economy of Paraguay depends basically on agriculture; however, with the expected completion of the Itaipu Dam in 1988, the exportation of hydroelectric power will contribute an increasing share of the economy. For now, approximately 36 percent of the gross national product, 85 percent of the value of exports, and 51 percent of the nation's employment are provided by the agricultural sector.

Nearly nine million hectares (22.5 million acres) of land have been appropriated for farming. Only one million hectares (2.5 million acres) are under production by private ownership. Since there are virtually no limitations on the expansion of farm land, expansion in production agriculture is currently underway and will continue through colonization programs. These programs are developed on the basis of small family farms. Large numbers of this type of farmer are needed if colonization efforts are to be successful. Thus the training of farmers is one of the highest priority programs of agricultural education in Paraguay.

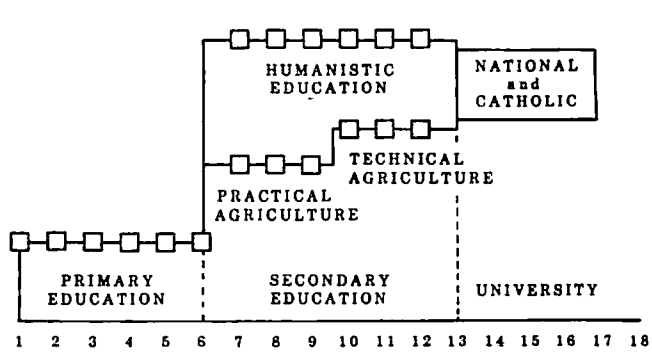


During the 1970's, the Ministry of Agriculture and Livestock, through the Directorate of Agricultural Education, initiated an ambitious plan to build a network of agricultural high schools throughout the country. This effort was supported by a loan from the International Development Bank. The Bank sponsored two projects to expand and strengthen agricultural education. Through the first project, three of the four national schools and one private school were modernized. Part of this project also provided for personnel training and curriculum revision. Under the second project, three new national schools were built, and one of the old national schools as well as a private school were remodeled. In addition, three national and two private schools were re-equipped. Training of personnel from these agricultural schools took place in Paraguay and other countries.

At the present time, there are 19 agricultural high schools located throughout Paraguay. All schools are designed to board students. They also have facilities needed for instruction in technical education in agriculture. Each school also has its own farm. Crops from and livestock produced on these farms are representative of conditions of the local community. School farm products provide a source of revenue for the school as well as part of the food for the cafeteria.

Diagram 1

National Education Systems and Level of Agricultural Education in Paraguay



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The national education system of Paraguay has three levels of six years each as shown in the accompanying diagram. Agricultural education is part of the secondary level and consists of two sub-levels. The practical agriculture curriculum is completed in either two or three years and is designed to prepare students for farming. The principle purpose of the curriculum in technical agriculture is to train technicians for the occupational needs of the agricultural sector. Both curriculums are more practical than theoretical. Students learn by doing on the school farm.

It was in this setting that an agricultural education expert from Kansas State University visited Paraguay during July of 1984. The trip was sponsored by the Kansas/Paraguay Partners for Progress. One of the purposes of the trip was to identify educational characteristics of teachers in the schools of agriculture and their level of skill in selected instructional competencies. Due to time and geographic limitations, on-site visitation was possible in only six of the 19 agriculture schools. The study is based upon information obtained from teachers in these six schools. Questionnaires were administered during a visit to the schools. Teachers were asked to provide information regarding their educational-professional background and instructional needs.

Selected Teacher Characteristics

A profile of selected characteristics of teachers is shown in Table 1. The average teaching experience in the present school (4.9 years), other schools (2.9 years), and total teaching experience (5.1 years) are reported. Thirty-nine percent of the agriculture teachers have completed a university degree program. A majority (61 percent) of the teachers reported attending some kind of in-service training. An examination of teacher participation in in-service courses since 1981 showed an increase to 79 percent.

Classroom Instruction Competencies

Table 2 presents the level of competence presently possessed and considered needed for various skills in the area of classroom instruction. The difference between the mean value of competency presently possessed and considered necessary was the highest for initiating, supervising, and maintaining an agricultural education club (1.7); making visual aids (1.5); filing and storing visual aids (1.5); using problem solving in teaching (1.2); selecting and using effective teaching procedures (1.2); equipping and using the classroom (1.2); and developing goals for student performance (1.1). Data indicate that teachers perceive themselves as competent in those skills dealing with the development of course outlines, lesson planning, and classroom evaluation.

School Farm Instruction Competencies

The level of competency presently possessed and considered needed in the area of school farm instruction is reported in Table 3. Five competencies showed a difference of one or more in the mean value of competencies presently possessed and considered needed. These competencies are: recording school farm demonstrations by film (1.9); coordinating school farm activities with classroom instruction (1.1);

Table 1. Profile of Selected Characteristics of Agriculture Teachers

Teacher Characteristic	
Average teaching experience present school	4.9 years
Average teaching experience other schools	2.9 years
Average total teaching experience	5.1 years
University graduate	39 percent
Attend in-service teacher training courses	61 percent
Attend in-service courses since 1981	79 percent

Table 2. Classroom Instruction Competencies Presently Possessed and Considered Necessary as Indicated by Agriculture Teachers (N=57)

	Weighted Mean Evaluation[a]	
Competency	Presently Possessed	Considered Necessary
Initiation, supervising, and maintaining an agricultural education club	2.8	4.5
Making visual aids for the classroom	3.1	4.6
Filing and storing visual aids and other materials	3.0	4.5
Using problem solving in teaching	3.5	4.7
Selecting and using effective teaching procedures	3.4	4.6
Equipping and using the classroom	3.2	4.4
Developing goals for student performance	3.6	4.7
Developing lesson plans	3.7	4.6
Evaluating the outcome of classroom instruction	3.8	4.7
Developing course objectives	3.9	4.8
Developing a course outline	3.9	4.7

[a] Weighted mean evaluation was based upon a numbered value rating for each level of competency (5 — considered to 1 — decidedly lacking) and determined by dividing the total weighted score by the total number of respondents. The highest possible weighted value was 5.0.

Table 3. School Farm Instruction Competencies Presently Possessed and Considered Necessary as Indicated by Agriculture Teachers (N=57)

	Weighted Mean Evaluation	
Competency	Presently Possessed	Considered Necessary
Recording farm demonstrations by film	2.4	4.3
Coordinating farm activities with classroom instruction	3.7	4.8
Summarizing ad reviewing farm demonstrations	3.5	4.5
Teaching students new farm skills	3.8	4.8
Evaluating the outcomes of farm instruction	3.6	4.6
Keeping records of farm work	3.6	4.6
Developing farm demonstrations with students participating in individual demonstrations	3.8	4.7
Developing policy and objectives for the farm	3.6	4.5
Maintaining student discipline on the farm	4.0	4.8

summarizing and reviewing school farm demonstrations (1.0); teaching students new skills on the farm (1.0); and evaluating the outcomes of school farm instruction (1.0). Teachers apparently feel competent in discipline on the school farm.

Summary

The inconsistencies of teacher preparation and inadequate facilities at the agricultural high school level are being reduced in Paraguay. A concerted effort is being made to improve teacher training. Programs of this nature will become even more effective by basing offerings on data identifying teacher interests and needs. Through the assistance of the International Development Bank, in-service programs for teachers are being conducted and facilities are being improved. The results of these efforts will be to effect the quality of instruction of students and ultimately the productivity of agriculture.

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Empirical Research Project As a Teaching Tool For Undergraduate Agricultural Marketing and Prices

James R. Russell, David M. Henneberry, and Elaine C. Batchelor

Abstract

Empirical research projects can help students to bridge the gap between theory and application of theory in agricultural disciplines. Incorporation of modern computer technology, a problem solving component and theoretical material develops and reinforces the linkages between university instruction and professional development. However, student stress and anxiety, faculty time and available resources hinder adoption of empirical research projects in some environments. The Oklahoma State University experience may be a model for other universities to use as a blueprint for the construction of individually tailored empirical research projects.

Recent literature has emphasized the role of the university in the development of students' professionally applicable skills. Schaefer has indicated that today's agricultural graduates need good communication skills, both written and verbal, problem solving skills, appropriate technical backgrounds, and task-oriented cooperative attitudes. Merritt provided a ranked list of twelve high priority course areas not adequately represented in agricultural curricula. Included among these areas were problem solving (ranked second in order of importance), use of computers in agriculture (ranked seventh) and student projects (ranked twelfth). In an effort to address these student and curricula concerns, an empirical research project is currently being used at Oklahoma State University to teach agricultural marketing and prices.

The design and administration of the empirical research project used will be described in this article. Reasons for particular design decisions, as well as perceived effectiveness of the teaching method will also be discussed. Before discussing the specifics of the research project, a general overview of the course will be presented to allow the reader to evaluate potential applicability of using empirical research projects as a teaching aid in other agricultural courses.

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The Course

"Agricultural Marketing and Prices" is a senior level course. It is required for agricultural economics students in the "marketing and business" option and is a controlled elective for agricultural economics students in other options. Enrollment typically ranges from 40 to 55 students. Usually, over 90 percent of these students will be seniors with declared majors in agricultural economics. Prerequisites for the course include both a junior level "Agricultural Marketing" course and a junior level "Agricultural Prices" course. On average, approximately 50 percent of the students in a given class will have had a course on microcomputers, another 20 to 30 percent will have had another computer course (generally in FORTRAN or COBOL programming), while 20 to 30 percent will have had no formal computer training. The basic teaching goals of the course include analysis of the marketing system with emphasis on inter-industry and intra-industry relationships, and aplication of decision tools to the problems of system efficiency.

Design of the Term Project

The Ideal

Educational literatue suggests a number of characteristics and techniques useful in the design of undergraduate term projects. The importance of incorporating computers into the educational procss is also recognized by many authors (Diamond and Cantrell; Fiske, Battle and Taylor; Foster and Walker; Merritt; Olien; Reber and Kern; Quick and Talley;