The general conclusion made was that animal science majors score higher than other agriculture majors and non-agriculture majors. Agriculture majors other than animal science also tended to score higher than non-agriculture majors.

No differences in performance were found between male and female students. There was less than one-half point difference in the mean scores of men and women in both the fall and spring semesters.

No significant differences existed due to variations in the students' farm backgrounds. One explanation for this could be that the subject matter in the course was primarily biologically-oriented rather than production-oriented. On the other hand, whatever advantage farm-reared students may have had might have been more than compensated for by the stronger science backgrounds of the urban-reared students. Another study is being conducted to determine the effects of high school science and mathematics backgrounds on performance in college-level courses in animal science.

Table 3. Results of Analyses of Variance Among Various Factors Affecting Performance in an Introductory Course in Animal Science.

Variable	Fall Phase Probability of a Chance Occurrence (less than:)	Spring Phase Probability of a Chance Occurrence (less than:)
Class	.0001	.005
Section and/or Year	.25	*
Farm Background	*	*
Major	.025	.25
Sex	*	*

*F Ratio was lesss than 1.0.

Two additional observations made during this investigation are of some interest. During the past five years, the number of women in this introductory course has increased significantly. The percentage of women enrolled for each of the past five calendar years was 4.0, 16.3, 21.0, 26.2, and 29.0. respectively. The same trend has been observed in most other classes in agriculture at this institution. The percentage of students without farm backgrounds has also increased from 29 percent in 1972 to 37 percent in 1976.

A Program of Professional Graduate Studies In Animal Science

L. M. Schake

Abstract

Since 1969 the Department of Animal Science has offered the Master of Agriculture degree in eight different suboptions to train industry professionals. Major components of the 36 credit hour graduate program include formal training in agriculture and business, a professional internstudy, and a professional paper. The philosophy, development, application, and success of the degree are discussed for students, teachers, and administrators.

Introduction

The American land grant colleges are exceptional and unique among educational institutions in the United States. Land grant colleges evolved educational programs founded upon scientific research to train and prepare students for specific and practical service in agriculture and related areas (Mumford, 1940). This concept has been extended and adapted to current and perceived needs as both research and production agriculture have advanced.

During the past several decades technological advancements in animal agriculture have been applied more rapidly than ever, resulting in larger production units which require more investment capital and greater management expertise than previously. These changes, a direct result of scientific advances, have spawned the need for educational programs that prepare students more thoroughly than do traditional baccalaureate degrees for careers as professional managers in commercial agriculture. This need was crystalized as a new program of professional graduate studies, the Master of Agriculture (MAgr), in the College of Agriculture at Texas A&M University in 1969. The degree concept was similar, in many respects, to the Master of Business Administration (BMA) program offered by business colleges.

The Department of Animal Science was instrumental in applying the new degree concept. Staff from ranch management, feedlot management, meat industries, applied genetics, swine management, and other disciplines were designated to chair these MAgr degree programs and counsel students. It soon became obvious that students were curious about and interested in this new professional degree. The subsequent discussion is based upon six years of experience representing 68 Animal Science MAgr graduates.

A New Teaching Concept Emerges

The goal of the MAgr degree is to train agri-business professionals (practictioners) as opposed to training teachers and researchers through traditional Master of Science (MS) programs. Students desiring training beyond the BS degree now have two options available to them. Qualified students can now complement their career objectives with more precise training than before. Rapid student enrollment in this program indicated student interest in pursuing the MAgr degree.

Entering students were required to meet the same minimum requirements for graduate studies in either MAgr or MS programs. This requirement included a Graduate Record Exam score of 800 or more plus a 3.0 (4.0 possible) or above grade point average for their BS degree. Students with less than a 3.0 grade point average were required to demonstrate their academic abilities during a probationary program. Non Animal Science

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majors who satisfied the above requirements were required to overcome undergraduate Animal Science course deficiencies before enrolling in graduate courses. A formal degree program was developed by the student and his advisory committee during the first semester of graduate work. Some courses were developed specifically for this new professional program. These plus existing courses were used to satisfy the 36 credit hour minimum requirement for the degree. A typical MAgr degree program, as selected from new and existing courses, is outlined in Table 1 for a student whose career goal is to be a feedlot manager. Approximately one calendar year is required for students to complete the formal course work of the 20-24 month degree program. A six to eight month professional internstudy in a successful feedlot is the next phase of training.

Interning - An Added Dimension

Interning as perceived in the MAgr degree is an informal, yet structured means of achieving that all-important ingredient, involvement in a teaching-learning experience (Schaefer and Kauffman, 1975 and Patton, 1975). A successful internstudy is often the most vivid learning experience a student undertakes. It is that one time when a student may apply technical training, learn of an industry, make mistakes, culture future employment opportunities, and mature professionally in a preplanned environment. There must be significant inputs by (1) the student, (2) the interning firm, and (3) the academic advisor to create a meaningful intern experience.

Table 1. Degree Program for Professional Graduate Studies

Course name	Dept.	Course prerequisites	New (N) or Established (E)	Credit hours
Accounting Concepts and Procedures	Actg.	Graduate status	E	3
Financial Planning of the Farm Firm	Agr. Ec.	Graduate status	E	3
Law and Agriculture	Agr. Ec.	Graduate status	N	3
Advancements in Beef Cattle Production	An. Sci.	Undergraduate production		3
Feedlot Management	An. Sci.	Undergraduate production	N	3
Management Seminar	An. Sci.	Graduate status	E	1
Problems (Professional paper)	An. Sci.	Graduate status	E	1
Professional Intern study	An. Sci.	Graduate status	N	4
Financial Management	Fin.	Graduate status	E	3
Personnel	Mgt.	Graduate status	E	3
Sales Management	Mktg.	Senior class.	E	3
Cereal Grain for Human Food	Soil & Crop Sci.	Undergraduate agron. courses	E	4
Control of Diseases of Cattle	Vet. Med.	Graduate status	N	3

1. Obtained from 1976-77 Graduate and Undergraduate Catalogs
2. Sales Management is a senior level undergraduate course.

The student must be properly prepared for interning. The formal course work must compliment and usually precede the intern experience. Academic success in well selected courses is a mandatory prerequisite. The student must also be in a receptive and inquisitive frame of mind and willing to volunteer for numerous opportunities while interning. He must be prepared to accept successes and failures with equal grace. In brief, students must realize that interning is an opportunity to learn at an accelerated pace from individuals who are often neither employed nor trained to instruct. MAgr students are advised to deliberately establish a strong working rapport with the entire staff of the interning firm as soon as possible. Additionally, students are required to maintain a daily log of their activities and impressions in order to establish a record for later study and evaluation. This log has also served as an introduciton to interning for other students. The student should realize that while interning he or she must perform as a professional, representing his university and a degree program. A successful internstudy may either directly or indirectly create the first employment opportunity in the student's chosen profession.

The firm that accepts the responsibility of interning a student must be deliberately selected and advised. Not all successful firms offer the same interning opportunities. Management and the entire staff must be able to recall when they, too, lacked experience if interning is to be most successful. Management should be fully advised by the academic advisor (not the student) of the demands and expectations of interning. A detailed schedule should be established to allow the student to gain training and experience in major areas within the firm. Decisions regarding duration of the internstudy, the professional paper topic, establishing field seminars, and student progress should involve the student, manager of the interning firm, and the academic advisor. The issue of student compensation while interning should be introduced to management by the academic advisor, but the rate of compensation should be established between the student and management. An ideal time for this discussion is during a preliminary student-manager conference arranged by the academic advisor. Student compensation has ranged from $300 to $1,000 per month. The academic advisor should establish at least two field seminars to allow student, management, and the academic advisor an opportunity to discuss the student's

progress and other aspects of interning. These 30 to 60 minute field seminars are most frequently held in the office of the interning firm. The use of written reports submitted by management and student have been employed to monitor interning, but their nature varies widely from program to program. Students frequently ask how long interning should last. We believe successful interning is need dependent, not time dependent. If one student can achieve the essentials of interning a few months earlier than another, he should be encouraged to do so. Most interns require from 6 to 8 months. Logically, ranch management interns may require more time than meat processing industry interns due to the very seasonal nature of ranching compared to the meat industry.

The academic advisor must be dedicated to the program of professional study and growth. This dedication should be well conceived and founded and must exist at all academic and administrative levels within the department, college, and university. Each advisor must satisfy himself that the MAgr degree is the best alternative for those students he advises. The needs of the student must be maintained as the primary objective of any teaching effort. Likewise, the advisor must have complete academic competence and thorough knowledge of the industry involved. Membership in both professional and trade organizations can assist young staff members in gaining this confidence. Previous employment within the industry is of obvious benefit. The advisor of professional study programs must have an adequate budget for travel and communications. These budgets should allow the student, management, and advisor to establish contact as frequently as considered essential by any of the parties at the expense of the department involved.

Professional Paper

Professionals must have the ability to organize and express their thoughts clearly and forcefully. The professional paper is written to attain this goal and more. Through it a student learns to compile both technical and industry data. Professional paper topics should be an extension of some critical concern of the interning firm. Topics may involve comparisons of several products, evaluation of profit centers or of previously collected field data, establishing an improved personnel structure, developing production projections, applying new production techniques, and numerous other production-management related considerations. When topics of direct interest to management are identified, at least three major benefis result: 1) management will take a more direct interest in the student and work more closely with him, 2) the resulting professional paper contributes to the interning firm, and 3) the student becomes more deeply involved with an actual management situation as part of his professional training. The professional paper is developed into its final form when the internstudy ends and the student returns to campus where he has access to a library and the academic advisor. Professional papers consist of six major chapters: Introduction, Literature Review, Materials and Methods with stated objectives, Discussion, Application of Results (Summary), and Literature Cited, plus an Appendix, Acknowledgements, and Biographical Summary. The unique challenge of a professional paper is the chapter of Application of Results. The MAgr student must excel in transforming technical data and concepts into workable and profitable business practices. Copies of the professional paper should be shared with the student's committee members prior to the final oral examination. Some have been published in trade or technical journals; others may receive no more exposure than the departmental library. Firms may wish that the paper remain inhouse and not be published.

After the student completes the professional paper he is ready to schedule his final oral examination by committee members. Industry professionals are encouraged to serve as committee members and also particpate in the examination process. The industry professional is often a member of the management team of the firm in which the student interned. He may have served as a visiting professor and instructed the student in one or more of his formal courses. Occasionally off-campus graduate classes have been instructed by one or more industry professionals working with full time faculty members. This has been especially beneficial for students since the primary industry may then become available as a teaching laboratory.

Status and Success of Professional MAgr Students

How well have the combined concepts of the MBA degree in the land grant setting advanced? Data on all MS and MAgr students (178) graduated from 1970 through 1975 in Animal Science are given in Table 2.

Table 2. MAgr vs MS Students, Department of Animal Science (1970-75)

Item	MAgr	MS
Number graduated	68	110
Age when admitted to graduate school	26	25
Graduate record exam score		
Verbal	414	413
Quantitative	524	537
Total	938	950
Undergraduate grade ratio (4.0 possible)[1]	2.86	2.92
Graduate grade ratio	3.47	3.37
Previous advanced degrees, percent	9.5	3.4

[1] Students with less than minimum grade ratios were required to demonstrate academic ability during a probationary program.

MAgr students were a year older and more (9.5 vs 3.4 percent) held advanced degrees than did MS students at the initiation of their respective degree programs. Several MAgr graduates have since initiated doctorate programs. The two degrees were conceived as coequals, and these data support that point.

Placement opportunities for graduates of any degree program should be considered before the program is proposed on a widespread basis. MAgr graduates achieved

slightly higher initial salaries than MS graduates. But the difference was less than $1000/year and may suggest only the willingness of agricultural industries to hire talent trained more in keeping with their needs. Post graduate performance data are not uniformly available. Many success stories could be related among both degree categories. Perhaps the most meaningful measures of postgraduate success are those comments and reflections offered by former students. Students rank both MAgr and MS programs very highly. MAgr students uniformly agree that successful interning is a once-in-a-lifetime opportunity, a conclusion others have also reached. (Lowrey, 1977; Oxley et al., 1977; Gunn, 1974 and Perry and Baker, 1971).

Future Emphasis and Direction

The MAgr degree has evolved into a highly functional and popular degree option within the Department of Animal Science and other departments. Present enrollment in the College exceeds 200 MAgr students. Regardless of current and past success, the program needs continuous reevaluation and improvement. Several suggestions have been made by MAgr committee members in Animal Science and a similar College of Agriculture committee.

To meet the changing needs of industry, new courses and new MAgr departmental suboptions must constantly be explored. Currently the Departments of Agricultural Engineering and Animal Science are considering offering a MAgr program which emphasizes feed manufacturing-management. New courses would be required for such a program. The need for a course emphasizing professional ethics and career development in agriculture has frequently been discussed (Kinard, 1974).

Selection Process

An even more stringent process for selecting prospective students has also been proposed. Current academic qualifications plus an interview of applicants by a special committee has been suggested. This concept would most likely be applied if a doctorate of professional studies were developed. With college-wide programs in professional studies being offered, the opportunity for the identification of a faculty of professional studies could further serve to give the degree greater emphasis and visibility. Logically an administrative post with the rank of dean would follow. These and other questions merit careful consideration before enactment. They illustrate the potential scope and contribution of the concept of professional studies in agriculture. Regardless of the ultimate direction of professional studies in agriculture, the MAgr degree has been established as another dimension in training talented individuals to serve agriculture. Their service can be limited only by their individual abilities, their professional training, and the use of the fundamentally sound knowledge base provided by the experiment stations of the land grant college system.

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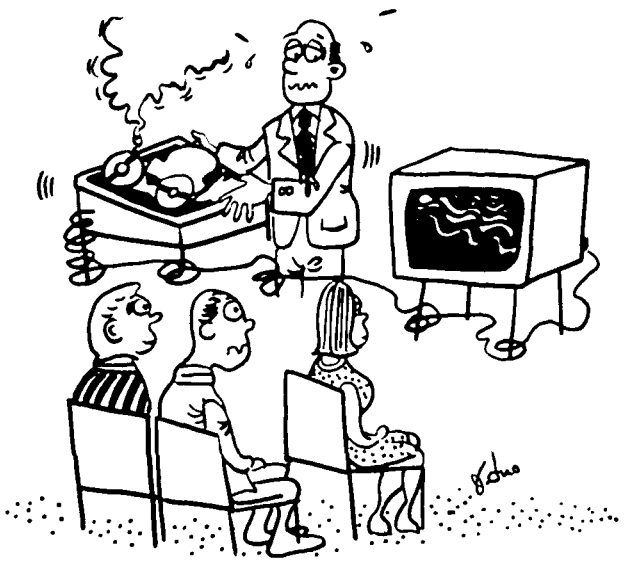
Resources for Teaching and Learning

Wesley J. F. Grabow

Resource Anxiety

Often we fail to use a specific teaching-learning resource because we're afraid we can't use it successfully. This is probably true for all resources, both inanimate and animate, but more evident in the resources whose use requires more manual and cognitive skills than do



Resource anxiety reinforces non-use

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