

Vocational Agriculture Teachers' Opinions Relative to Selected Animal Science Competencies

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New technology and increased knowledge have brought about changes in production agriculture which have increased production and improved efficiency. These changes in agriculture have increased the need for vocational agriculture students to be well prepared in technical agriculture.

Traditionally, many vocational agriculture programs have been organized to provide instruction in production agriculture. What is included in the instructional program varies by state and community and by needs, interests and abilities of vocational agriculture teachers.

The main source for obtaining vocational agriculture teachers is the land grant institutions or those institutions designated to provide teachers of vocational agriculture. Although agricultural education staffs try to develop and maintain quality teacher preparation programs, they do not always have complete control. In most institutions, technical and skills courses are taught outside the agricultural education department. Consequently, if lines of communication among colleges and departments are not kept open, course content may not be in the best interest of those preparing to teach vocational agriculture.

Research Questions

The purpose of this study (Thomas, 1979) was to determine if there was significant difference between the opinions of vocational agriculture teachers in eleven western states and the findings of the National Agriculture Occupations Competency Study (NAOCS) relative to the importance of selected animal science competencies needed to gain entry into and advancement in animal science occupations. Additionally, the study was used to determine vocational agriculture teachers' abilities to perform the selected animal science competencies and also where they obtained the proficiency to perform each competency. From these determinations, a data base was developed in the animal science competencies. These data should provide curriculum planners, teacher educators and animal science professors with information that will aid in designing curriculum and course content to better prepare teachers of vocational agriculture. The findings also provide information that will aid in the design of in-service programs for updating vocational agriculture teachers in animal science competencies.

Research Procedures

Sample Investigated

For this study, 165 participants were randomly selected from the vocational agriculture teachers in 11 western states: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming. Fifteen teachers from each state were selected from those listed in the 1978 Agriculture Teachers Directory.

Methodology

A 58-item survey instrument was developed and used for the purpose of gathering data for this study. After reviewing a number of different instruments, the survey statements were selected from the National Agriculture Occupations Competency Study, which had been validated by persons employed in animal science occupations and/or their work supervisors. Based on this procedure, a list of 50 competencies in animal science was compiled by selecting those competencies that were validated and rated at 2.5 or higher on a 4.0 Likert-type scale by the respondents of the National Agriculture Occupations Competency Study (NAOCS). Competencies were selected that fit into the following categories of animal science:

1. General Animal Science Skills;
2. Animal Science Management Skills;
3. Animal Breeding and Artificial Insemination Skills;
4. Feeding and Nutrition Skills;
5. Veterinary-Like Skills; and
6. Selection and Evaluation Skills.

The research instrument was composed of three sections: demographic information, vocational agriculture teacher opinion scales and teacher attitude reaction scales.

Particular attention was given to obtaining a high response rate. An introductory letter along with a survey instrument was mailed to each selected respondent. One follow-up letter followed the mailing of this letter and the survey instrument. A 65% overall return rate was achieved from the vocational agriculture teachers. The summary of the response rates is presented in Table 1. A list of pre-service institutions where the respondents obtained teacher preparation in vocational agriculture is presented in Table 2.

Analysis of the Data

Data gathered were placed on Fortran coding forms and keypunched on computer cards for analysis.

Computer programming needs were minimized through use of the Statistical Package for the Social Sciences (SPSS) program. Descriptive statistics were computed for all variables. Specific statistical tests of Analysis of Variance and the Pearson Product Moment were used, as required, to satisfy the objectives of this study. Data were categorized into the following sections for analysis and reporting:

1. Profiles;
2. Differences; and
3. Relationships.

Findings

Vocational agriculture teachers in this study and the respondents to the National Agriculture Occupations Competency Study (1978) (NAOCS)

Table 1

Respondents in the Study

State	Number Responding	% of Sample Responding	% of Total
Arizona	12	80.0	11.2
California	9	60.0	8.4
Colorado	12	80.0	11.2
Idaho	13	86.6	12.2
Montana	11	73.3	10.3
Nevada	10	66.7	9.4
New Mexico	7	46.7	6.5
Oregon	9	60.0	8.4
Utah	7	46.7	6.5
Washington	8	53.3	7.5
Wyoming	9	60.0	8.4
Total	107	65.0	100.0

Table 2

List of Pre-Service Institutions Where Respondents Obtained Teacher Preparation in Vocational Agriculture n=107

Institution	Number of Respondents
University of Arizona	12
University of California (Davis)	2
Cal Poly State University (San Luis Obispo)	8
California State University (Chico)	3
Colorado State University	11
University of Wyoming	8
University of Idaho	8
Montana State University	13
California State University (Fresno)	3
Brigham Young University	3
University of Nevada	6
New Mexico State University	7
Texas Tech University	1
Oregon State University	5
Utah State University	9
Washington State University	8
Total	107

indicated general overall agreement that the competencies within the six categories of animal science are relatively important (Table 3). As shown in Table 3, the NAOCS respondents rated all groups higher in importance than did the vocational agriculture teachers. However, there was considerable difference of opinion on the degree of importance attached to the different animal science categories between the two groups. Respondents to the NAOCS perceived the animal breeding and artificial insemination competencies as the most important category of animal science competencies while vocational agriculture teachers rated these as the least important. Similarly, the respondents to NAOCS rated the veterinary-like and general animal science competencies more important than did the vocational agriculture teachers. The data in the remaining three categories of animal science competencies indicated more consistency between the two groups. Vocational agriculture teachers rated the selection and evaluation competencies as the most important of the six categories. There was no disagreement from the respondents to the NAOCS that these competencies were not important; however, NAOCS respondents do not perceive them as the most important. Vocational agriculture teachers rated management and feeding as their second and third choices respectively. The respondents to the NAOCS indicated these competencies are important but not as important as the animal breeding, veterinary-like and general animal science competency groups.

The difference of opinion between vocational agriculture teachers and the respondents of the National Agriculture Occupations Competency Study relative to importance of the selected animal science competencies may be due to many reasons. Many college students preparing to teach

Table 3

Comparison of Vocational Agriculture Teachers' Responses with National Agriculture Occupations Competency Study Responses as to the Relative Importance of the Six Groups of Selected Animal Science Competencies

Animal Science Competency Group	Number of Competencies	Grand Mean Vo-Ag Teachers	Grand Mean NAOCS	Mean Difference
General Competencies	9	2.87	3.49	0.62
Management Competencies	9	3.04	3.19	0.15
Feeding and Nutrition Competencies	9	3.01	3.24	0.23
Artificial Insemination and Breeding Competencies	9	2.41	3.69	1.28
Veterinary-Like Competencies	9	2.91	3.56	0.65
Selection and Evaluation Competencies	5	3.12	3.48	0.36

Note. Based on a scale of 0 to 4, with 0=does not apply and 4=essential.

vocational agriculture may not be exposed to advanced courses in animal science where the animal breeding and veterinary-like competencies are taught. Prospective vocational agriculture teachers have had good exposure to the livestock selection and evaluation skills as well as feeding and management competencies through basic required animal science courses. Many of the technical competencies are based on relatively new developments in animal science; therefore, many vocational agriculture teachers may not have had exposure through pre-service course work or in-service programs to the latest and newest developments in animal science.

When asked to rate their ability to perform the selected animal science competencies, vocational agriculture teachers indicated they had above average ability (Table 4). This data is strongly supported by an r of .85 at the .001 level of probability when the vocational agriculture teachers' ratings of importance are compared to their ability to perform the selected animal science competencies. They were most proficient in the animal selection and evaluation competencies. The artificial insemination and breeding competencies received the lowest proficiency ratings from these teachers.

Table 4

Summary of Vocational Agriculture Teachers' Responses to Ability to Perform the Six Groups of Selected Animal Science Competencies

Animal Science Competency Group	Grand Mean
General Competencies	2.67
Management Competencies	2.60
Feeding and Nutrition Competencies	2.57
Artificial Insemination and Breeding Competencies	1.93
Veterinary-Like Competencies	2.44
Selection and Evaluation Competencies	2.68

Note. Based on a scale of 0 to 4, 0=cannot perform, 4=high ability.

The differences in ability to perform the selected animal science competencies may have been caused by a variety of factors. Vocational agriculture teachers are developing competency in the animal sciences primarily through their own experience (Table 5). The second source was their pre-service teacher preparation: agricultural education and animal science courses. Thirdly, fewer vocational agriculture teachers are gaining competency through in-service training programs. An r value of .59 at the .001 level of probability when comparing vocational agriculture teachers' source of ability with their ability to perform the selected competencies supports their confidence in themselves with these competencies. However, mean scores in all competency groups were affected by the "0" response which indicated that some vocational agriculture teachers had not been exposed and therefore could not perform some of the highly technical competencies.

Table 5

Summary of Vocational Agriculture Teachers' Responses as to Major Source of Obtaining the Selected Animal Science Competencies

Animal Science Competency Group	Pre-Service %	In-Service %	On Own %	Other %	Not Exposed %
General Livestock Competencies	16.9	7.0	68.2	0.06	7.3
Management Livestock Competencies	40.0	16.6	39.5	0.06	3.2
Feeding and Nutrition Competencies	44.7	18.7	31.6	1.70	3.3
Artificial Insemination and Breeding Competencies	19.8	20.4	33.0	1.60	25.1
Veterinary-Like Competencies	27.2	12.9	49.8	1.20	8.8
Selection and Evaluation Competencies	31.3	24.4	42.1	0.03	1.8

Several reasons why vocational agriculture teachers are gaining much of their technical competence through their own experience are possible. One apparent reason is that as the need becomes paramount skills are learned to the "performance" level. Another possible reason is that technical course work in the pre-service teacher preparation program is not being taken to the "doing" or "performance" level (Table 6). Nearly three-fourths of the respondents indicated exposure to the competencies only through the lecture method of instruction. Yet another reason identified is that sufficient in-service training programs are not always available (Table 7). Over fifty percent of the respondents indicated that in-service programs were average or below or did not exist at all.

Conclusions and Implications

Teaching livestock production to secondary vocational agriculture students has traditionally been a major part of the production agriculture program. However, much of what vocational agriculture teachers teach is based on what vocational agriculture teachers believe is important. Also, vocational agriculture teachers tend to teach those manipulative skills which they are confident they can perform effectively.

The results of this study indicated that there is some disagreement between vocational agriculture teachers and the respondents of the National Agriculture Occupations Competency Study relative to the importance placed on selected animal science competencies. Based on the findings in this study, the authors believe that there is a need for increased cooperation between agricultural education staffs and animal science departments to improve the preparation of vocational agriculture teachers in the animal sciences. Additional research is needed to help determine the competencies needed by prospective vocational agriculture teachers and the types of in-service training programs needed to update those vocational agriculture teachers in the field.

Table 6

Vocational Agriculture Teachers' Responses Indicating Most Prevalent Teaching Method Exposed to in Pre-Service Teacher Preparation Programs by Institution

Institution	Demon- stration	Lecture	Hands-On	Totals
University of Arizona	1	7	4	12
University of California (Davis)	0	2	0	2
Cal Poly (San Luis Obispo)	0	3	5	8
California State University (Chico)	0	2	1	3
Colorado State University	1	7	1	9
University of Wyoming	0	7	1	8
University of Idaho	0	7	1	8
Montana State University	0	10	3	13
California State Univ. (Fresno)	0	2	1	3
Brigham Young University	0	3	0	3
University of Nevada	1	5	0	6
New Mexico State University	0	7	0	7
Texas Tech University	0	1	0	1
Oregon State University	0	5	0	5
Utah State University	0	7	2	9
Washington State University	1	5	1	7
Totals	4	80	20	104
	3.8%	77%	19.2%	

Table 7

Vocational Agriculture Teachers' Perceptions and Attitudes Toward Their In-Service Training Programs by State

State	Non-Existent	Poor	Average	Good	Excellent	Totals
Arizona	3	3	2	2	2	12
California	1	1	3	3	0	8
Colorado	2	1	4	3	2	12
Idaho	3	1	1	8	0	13
Montana	2	1	3	4	1	11
Nevada	2	2	1	5	0	10
New Mexico	2	2	1	2	0	7
Oregon	0	1	2	6	0	9
Utah	0	1	2	1	3	7
Washington	1	1	2	3	0	7
Wyoming	2	1	0	5	0	8
Totals	18	15	21	42	8	104
	17.3%	14.4%	20.2%	40.4%	7.7%	

Recommendations

1. It is recommended that specific animal science competencies be identified for each skill area of animal science so that the individuals entering into vocational agriculture may specialize and structure personal experiences to upgrade areas of technical weakness.

2. It is recommended that agricultural education staffs evaluate those courses in animal science that prospective vocational agriculture teachers are taking to determine if the courses are providing instruction and training in the animal science competencies identified for the skill areas.

3. It is recommended that steps be taken to improve the technical competence of beginning vocational agriculture teachers to assure that they possess adequate ability to perform the competencies prior to teaching.

4. It is recommended that the utilization of improved in-service teacher education offerings in animal science be considered as a means of overcoming the identified weakness in technical competence in animal science.

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