

AN ABSTRACT OF THE THESIS OF

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There have been many changes in American society since the 1960's dealing with civil rights and the labor force. These areas, in turn, have influenced and been influenced by changes in education such as Title IX and Title II. The purpose of this study was to investigate the sex-equity characteristics of vocational agriculture competency attainment in Oregon. Detailed information about how male vocational agriculture students perceived their vocational agriculture competency level differently from female vocational agriculture students who shared the same vocational agriculture classroom, and information about compared male/female student perceptions of competency attainment with vocational agriculture instructor perceptions of competency attainment for each group was sought.

One-hundred-eighty (180) Junior-level Agriculture III

students gave a self-perceived competency rating on a scaled listing of 53 agricultural competencies; 17 vocational agriculture instructors gave a competency rating on the same competency list for males and females in their classes.

Resulting data showed that a significant difference occurs in self-perceived male and female competency attainment in the Agricultural Mechanics taxonomy; instructors rated their male and female students significantly different in the same taxonomy.

Vocational Agriculture Competencies
and Sex-Equity in Oregon

by

Michael J. "Zip" Krummel

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Chairman of the Department of Vocational Education and
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Dean of Graduate School

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VOCATIONAL AGRICULTURE COMPETENCIES & SEX-EQUITY IN OREGON

INTRODUCTION

Blacks no longer sit only in the back of the bus; the voting age has dropped to 18; minorities have a guaranteed equal voice in American society; and women have ceased being second-class citizens. The 1970's and '80's have witnessed a series of social changes in the American way of life. Some of the more spectacular changes have occurred in civil rights and in the labor force. These areas, in turn, have influenced and been influenced by changes in education such as Title IX and Title II.

Title IX of the Education Amendments of 1972 prohibits discrimination on the basis of sex in education. Title II of the Education Amendments of 1976 requires that sex discrimination, sex bias, and sex stereotyping be eliminated from all vocational education programs. Each state was further required to set forth policies and procedures that would assure women and men equal access to vocational education programs, which include incentives to encourage the enrollment of both sexes in non-traditional programs of study.

Teachers play a tremendous socializing role in American culture, and they are a key to changing student concepts regarding sex role expectations (Kaplan, 1975;

Matthews and McCune, 1975). Because teachers can be such a vital force in changing student concepts, a real danger exists that teachers may actually increase and/or perpetuate the stereotypic attitudes of students (Henderson & Knight, 1980). A teacher's sex bias behavior could be an important factor in the achievement, performance, and self-image of females in traditionally male vocational education courses and youth organizations.

The perceptions and attitudes of teachers toward sex roles are traditional and presumably contribute to maintaining restrictive sex role expectations (Ricks and Pyke, 1973). This presumed bias has been the basis for several attitudinal studies in such areas as female enrollment in vocational agriculture courses (Ricks and Pyke, 1973; Henderson and Knight, 1980; Kaplan, 1975; Matthews and McCune, 1975), State FFA Degree application scores in relationship to sex (Henderson, 1981; Henderson and Knight, 1981; Moore, 1978), females pursuing careers as vocational agriculture instructors (Dunkle, 1981; Parmley, 1980; Ries and McCracken, 1980), and student perceptions and behaviors towards female vocational agriculture instructors (Parmley, 1980; Ries, 1980; Moore, 1978; Bass, 1977).

There have been few studies done on the self-perception of competency attainment for vocational agriculture skills of male vs female students. Similarly, there have been few studies on the instructor's perception

of student competency attainment for vocational agriculture skills for their male and female students. It was, therefore, deemed important that a study be completed which would investigate perceived differences in competency skill attainment for male and female vocational agriculture students.

Statement of the Problem

The purpose of this study was to investigate the sex-equity characteristics of vocational agriculture competency attainment in Oregon for male and female students of vocational agriculture classes. The study was also to 1) ascertain whether males perceived their vocational agriculture competency level differently from females who shared the same vocational agriculture classroom and 2) to compare male/female student perceptions of competency attainment with vocational agriculture instructor perceptions of competency attainment for each group.

The specific objectives of the study were as follows:

1. Identify self-assessed agricultural competency perceptions for students enrolled in Agriculture III of vocational agriculture programs in Oregon.
2. Determine if differences in perceived competency level attainment exist between male and female students in the junior level Agriculture III class of vocational

agriculture programs in Oregon.

3. Identify agricultural competency levels of male and female junior vocational agriculture students as perceived by their vocational agriculture instructors in Oregon.
4. Determine if differences in agricultural competency level attainment exists for male and female students as perceived by their vocational agriculture instructors in Oregon.
5. Determine if male and female vocational agriculture students perceive their agricultural competency attainment differently from their vocational agriculture instructors.

Definitions

The following terms are provided with specific definitions appropriate to the study at hand. All of the following terms used in the context of this paper will carry the meaning provided below:

1. **Agriculture:** The broad industry engaged in the production of plants and animals for food and fiber, the provision of agricultural supplies and services, and the processing, marketing, and distribution of agricultural products (Knebel and Richardson, 1982)
2. **Competency:** The state or quality of being capable or competent; skill; ability. This

term refers specifically to a recognized skill or ability in an agricultural area that a student in a Junior-level (Agriculture III) vocational agriculture class was expected to have attained.

3. **Competency Based Instruction:** Instruction based upon planned learning experiences in which performance objectives and content are specified and agreed to in advance of instruction based upon a detailed analytical process. The student is held accountable for attaining a measurable level of competency under prescribed conditions complying with designated standards (Knebel and Richardson, 1982).
4. **Future Farmers of America (FFA):** The national youth organization of students enrolled in vocational agriculture programs. The national FFA organization is composed of state FFA associations; state associations are composed of local FFA chapters. The FFA chapters are located in public schools offering instruction in vocational agriculture. The FFA activities are an integral part of the instructional programs under provisions of the national vocational education acts. The primary purpose of this

youth organization is to develop leadership, cooperation, and citizenship (Knebel and Richardson, 1982).

5. **Occupational Objective:** A student-selected, specific occupational goal that is the purpose for that person's enrollment in the instructional program (Knebel and Richardson, 1982).
6. **Self-Perceived Competency Attainment:** An individual's own perception or belief as to the skill or ability he/she has attained towards a specific task. For this study, the term specifically refers to Junior-level vocational agriculture students, and their perception of their own abilities or skills at a specific agricultural task.
7. **Sex Bias:** Behaviors resulting from the assumption that one sex is superior to the other (Title IX, Educational Amendments of 1972).
8. **Sex Equity:** The state of action which does not limit or deny a person or group of persons opportunities, privileges, roles, and rewards on the basis of their sex.
9. **Sex Role:** The characteristic and expected social behavior of an individual based entirely upon that person's sex. This also

includes the expected educational and vocational behavior of the individual based upon that individual's sex.

10. **Sex Stereotype:** Attributing behaviors, abilities, interests, values, and roles to a person or group of persons on the basis of their sex (Title IX, Educational Amendments of 1972).
11. **Supervised Occupational Experience Program (SOEP):** A series of related learning experiences designed to develop knowledge and skills in agriculture, which is an integral part of the instructional program of a student enrolled in vocational agriculture. These supervised learning experiences may be provided by utilizing facilities of the home, farm, school, or an agricultural business. Programs may include any of the following types of experiences: observation and exploration, school farm or school laboratory activities, supervised farming program, placement for farm experience, or on-the-job agricultural training (Knebel and Richardson, 1982).
12. **Vocational Agriculture:** A group of related courses of subject matter and practical experiences of which the purpose is to

develop competencies needed to enter and advance in agricultural occupations of less than a Baccalaureate degree level. The courses may include instruction in the following areas: agricultural mechanics; agricultural products, processing, and marketing; agricultural supplies and services; horticulture; forestry; production agriculture; renewable natural resources; animal science; and other agriculture (Moore, 1978).

13. Vocational Education: Organized educational programs, services, and activities which are related directly to the preparation of individuals for paid and unpaid employment, or for additional preparation of individuals for careers not requiring a baccalaureate or advanced degree (Knebel and Richardson, 1982).

14. Vocational Agriculture Student: An individual with an occupational objective in agriculture, enrolled in a vocational agriculture education program leading to entry or progress in a chosen occupational field.

Limitations

Because of the nature and structure of this study, it

was subject to the following limitations:

1. Self-assessment mailed instruments: It was assumed that high school students would respond accurately to the questions on a mailed questionnaire and that they can determine their own levels of competence. No objective testing of students' skill levels or competence was undertaken to verify the competence level assumptions made by students.
2. Instructor assessment of competency attainment by group on a mailed instrument: It was assumed that instructors could accurately assess the competency of groups and would respond accordingly to a mailed questionnaire. It was recognized that though there would be variation within the groups, the task assigned to instructors involved assessing group competence, which could be done without either bias or intentional fraud.
3. It was assumed that a geographical distribution of the sample vocational agriculture programs would give the most accurate view of competency level attainment for male and female students in Oregon. Therefore, a stratified random sampling process was used.
4. It was assumed that the study would be

statistically sound if at least 15-percent (15%) of the programs in the state of Oregon were sampled (Courtney, 1984).

REVIEW OF LITERATURE

Because the major changes and awareness in sex bias vs sex equity have been within the last decade, there was limited literature available for review for this study. However, this study was not the first to address the issue of sex equity in vocational education or vocational agriculture as many states have had sex equity projects carried out.

Sex stereotyping has been a quietly accepted fact for years in American society; the passage of a federal act does not necessarily change attitudes. Rural high school females face a strong home-versus-career conflict stemming from traditional rural values and myths about women (Dunne, 1980). Dunne goes on to say that, for the most part, rural secondary vocational education maintains its historically sex-stereotyped approach, channeling young women into traditionally female programs which leave them prepared for only the lowest-level jobs or for no paid work at all (Dunne, 1980). However, with the passing of Title IX as well as affirmative action programs, women have been showing increasing interest in traditionally male-intensive occupations; agriculture is one of these (Reynolds and Walker, 1975).

For the past several years vocational education has been confronted with providing sex equity in policies and programs in compliance with Title IX of the Education

Amendments of 1972 and Title II of the Education Amendments of 1976 (Title IX, Education Amendments of 1972; Title II, Education Amendments of 1976). The scope of Title IX and Title II extends from preschool through graduate school, and protects students and staff from sex discrimination. With regard to the numbers of individuals protected, Title IX and Title II are the most far-reaching civil rights laws that have ever been enacted in the United States (Verheyden-Hilliard, 1977).

Several studies have been completed to determine who or what is the influence in a female's occupational choice. The Advisory Committee on the Rights and Responsibilities of Women to the Secretary of Health, Education, and Welfare, 1975, stated that, "...the schools have been - and continue to be - among the major social forces perpetuating the stereotyped images of women, their vocational opportunities, aptitudes and interests..." (Weitz, 1975). A New Hampshire State Department of Education study found sex stereotyping, pressures from friends and family, lack of skill preparation, and lack of support from school personnel to be continuing problems for sex equity in the state (New Hampshire SDE, 1978). Other studies pointed to the parents as the major influence; Schenck (1977) states that "...by the fourth grade, girls' perceptions of occupations open to them are limited to four: teacher, nurse, secretary, or mother." Kane (1978) found that the

mother is the most influential person in a woman's career decision.

In terms of vocational education and, in particular, vocational agriculture, several studies have addressed specific aspects of sex equity. A study by Parmley (1980) found that neither teachers, administrators, students, nor parents encourage females to enroll in vocational agriculture courses. In the above cited study, all four groups indicated support for female enrollment and employment in agriculture, but all revealed preference for males as students and as employees. Because of the long history of women in farming, vocational agriculture instructors should have been aware of women's participation in farming and other agricultural leadership activities and should have designed educational programs to help women develop appropriate farming and managerial skills (Glesne, 1980).

However, when evaluating State FFA degree applications, it was noted that production agriculture instructors appeared to be more concerned with the quality of the program of the applicant than with the particular sex of the student (Henderson, 1980).

Women as vocational agriculture instructors must potentially deal with sex bias at several levels. They have been generally accepted by students, other vocational agriculture instructors, and the community. However, certain sex role biases and

stereotyping (i.e.: most of the female vocational agriculture instructors have been placed teaching the same area that most female vocational agriculture students are placed in - ornamental horticulture) are still common (Moore, 1978). A significant relationship was found between the perception of sex bias among female students and their desire to teach production agriculture (Ries, 1980). Ries (1980) also found that the job satisfaction of female instructors of production agriculture was influenced by their perception of sex bias among parents and employers of students.

Knight (1980) studied the recruitment, retention and placement of females in vocational education programs. It was concluded that:

1. Retention was improved when there were two or more females in a program;
2. Instructor attitude was critical to class acceptance of female students in nontraditional programs;
3. Prior experience in the field was a contributing factor to female enrollment;
4. Female success in nontraditional programs had a strong basis on role models;
5. Materials that include representations of females doing nontraditional activities was a significant factor in retention and involvement.

The review of the literature indicates that there have been studies dealing with sex-bias, sex-role-stereotyping, and sex-equity. However, no studies were found in the literature which focused specifically on a comparison of competency levels gained in vocational agriculture for males and female students. With the attention and money given to sex-equity efforts nationally, it was deemed important to determine whether progress was being made regarding equity on a competency level basis for students enrolled in vocational agriculture. Therefore, this study sought to investigate the sex equity characteristics of vocational agriculture competency attainment in Oregon for male and female students of vocational agriculture classes.

Research Questions

In order to statistically analyze the objectives of this study they were stated below in the null research question form.

1. There is no statistically significant difference in the self-perceived competency level attainment between male and female students in Junior-level Agriculture III classes of vocational agriculture programs in Oregon.
2. There is no statistically significant difference in the agricultural competency level attainment for male and female students

in Junior-level Agriculture III classes of vocational agriculture programs in Oregon as perceived by their vocational agriculture instructors.

3. There is no statistically significant difference in the self-perceived competency level attainment of male and female students in Junior-level Agriculture III classes of vocational agriculture programs in Oregon as compared to the agriculture instructor's perceptions of their competency level attainment.

METHODOLOGY

Population and Sample:

The vocational agriculture instructors in Oregon and the Junior-level (11th grade) vocational agriculture students enrolled during the 1983-84 school year with at least one year of previous vocational agriculture program experience were the population for this study.

To develop a frame, all of the vocational agriculture programs in Oregon were stratified into their respective Future Farmers of America (FFA) Districts and then alpha-ordered and numbered within each district. Utilizing a Table of Random Numbers (Mosteller, 1983), numbers were chosen to identify two programs from each district. This stratified random sampling procedure resulted in the selection of 20 programs, thus represented 19-percent (19%) of the target population.

A letter of introduction to the study and a response request with a self-addressed stamped envelope were sent to the vocational agriculture instructor of each randomly selected program. This gave the vocational agriculture instructor the opportunity to decide before receiving instruments whether or not to participate in the study; it also provided the researcher with the number of Junior-level students that would be participating from each program. It was felt that this procedure would also ensure a higher percentage of response/return of the actual instrument. When a negative response was received,

another vocational agriculture program was randomly selected from that same FFA District; this procedure continued until twenty (20) positive responses had been received. (See Appendix A)

A Panel of Experts (modified Delphi) consisting of three Teacher Educators, a State Specialist in Vocational Agriculture Education, and a State Sex-Equity Specialist established content applicability and validity of the instruments for both students and instructors.

Instrument refinement was accomplished via testing by two (2) vocational agriculture instructors and 18 students not selected to participate in the actual research.

Two instruments were used. The instrument for students consisted of an instruction page, two-and-one-half pages of agricultural competencies which students participating in a Junior-level vocational agriculture class should have obtained either during that year or in previous years of vocational agriculture course participation (competencies were selected from those published in the McClay study [McClay, 1978]). The competencies were derived from the six (6) major vocational agriculture instructional taxonomy areas: Animal Science, Plant Science, Soil Science, Agricultural Economics, Agricultural Mechanics, and Leadership. Each competency had a corresponding graduated five-point scale permitting students to rate their skill levels. An information page requesting demographic information was

also included (See Student Instrument, Appendix B).

The instructors' instrument included expanded instructions for both themselves and their students; the same competency listing as in the student's instrument but with a double-graduated five-point scale to offer separate assessments for males and for females on the same competency. (See Instructor's Instrument, Appendix C). No demographic information was requested of instructors.

Upon receipt of affirmative responses from the instructors of the program randomly selected, an instructor instrument and the number of requested student instruments were mailed to those programs. A self-addressed stamped envelope was enclosed for ease of return.

Treatment of Data:

The responses to the competencies listed in the instrument were analyzed in a contrasting direction using Paired t and Separate t statistical procedures. Frequency counts, means and percentages were used on the remaining data (i.e.: demographic).

Formulas:

$$\text{Paired } t = \frac{\bar{d} - \mu}{s_d}$$

$$\text{Separate } t = \frac{(\bar{X}_1 - \bar{X}_2) - (\mu_1 - \mu_2)}{s_1^2/n_1 + s_2^2/n_2}$$

The testing dealt with the following variables:

Fifty-three (53) agricultural competencies

Five (5) levels of competence for each competency

Two (2) sexes (male and female students)

Two (2) choices for living on a farm (yes, no)

Three (3) types of farms for those that lived on farms

Four (4) sizes of farms for those that lived on farms

Two (2) choices for working in an agricultural field after high school (yes, no)

Seven (7) choices for the agricultural area in which they would work after high school

Three (3) selections for number of years the student had been in vocational agriculture

Four (4) selections covering student age

Seven (7) choices for the student's self-perceived strongest vocational agriculture area

Seven (7) choices for the student's self-perceived weakest vocational agriculture area

Seventeen (17) vocational agriculture programs returned usable questionnaires

One hundred eighty (180) vocational agriculture students responded

Response Rate:

Usable responses were received from seventeen (17) of the twenty (20) programs that agreed to participate which was an eighty-five percent (85%) usable return; one respondent reported having no junior class members after

the semester class change, the other two non-responding schools reported having such a small number of juniors after the semester class change (one and two students, respectively) that they felt their input would be inconsequential to the study and therefore declined to submit completed materials (the 17 responses represented 16-percent (16%) of the state's vocational agriculture program population; the guideline used for this study was a minimum of 15-percent (15%) of the population [Courtney, 1984], therefore it exceeded the minimum acceptable amount); Student response totalled one-hundred-eighty (180), which was three percent (3%) of the state enrollment in vocational agriculture programs during the academic year 1983-84.

FINDINGS AND DISCUSSION

The purpose of this study was to investigate the sex-equity characteristics of vocational agriculture competency attainment in Oregon for male and female students of vocational agriculture classes.

Findings of the study were summarized according to the three major groups who participated in the study: female students enrolled in vocational agriculture programs, male students enrolled in vocational agriculture programs, and vocational agriculture instructors. The following is a summary of data treatment and a discussion of the findings.

Table one (1) shows the distribution of male and female student respondents.

Table 1: Distribution of Respondents by Gender

	<u>Teacher</u>		<u>Student</u>	
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
Male	15	88.2	143	79.4
Female	2	11.8	37	20.6
<u>TOTAL</u>	<u>17</u>	<u>100.0</u>	<u>180</u>	<u>100.0</u>

Approximately 79-percent (79%) of the vocational agriculture students in this study were male, 21-percent (21%) being female. Female vocational agriculture instructors comprised approximately 12-percent (12%) of

the total vocational agriculture instructor respondents.
Statewide FFA Participation:

The Oregon State Department of Education Agricultural Specialist's files were reviewed to determine the percentage of male and female memberships (for 1983-84) in the Future Farmers of America (FFA) student organization; there were 4035 total FFA memberships in Oregon with 2690 male and 1345 female members. Therefore, 67-percent (67%) of the 1983-84 FFA membership was male, whereas 33-percent (33%) was female. It can be seen that there was a higher percentage of female participation in FFA than male participation on a percentage of total individual participation basis.

Successful participation in FFA was analyzed at state achievement levels only. The 1983-84 State FFA Officer team was comprised of four males and two females, for 67-percent and 33-percent male and female participation, respectively. On the nine winning state contest teams there was a composite of 19 males and 16 females for 54-percent male and 46-percent female participation. Of the state proficiency awards granted during 1983-84, 16 awards were granted to males and 5 awards were granted to females for 76-percent and 24-percent successful male/female participation respectively (Galbraith, 1985).

Demographic Data:

Responses from vocational agriculture students can be generally categorized into two groups: demographic data and self-perceived levels of competence regarding vocational agriculture skills. Table two (2) summarizes the demographic data requested of the student respondents and was presented from the standpoint of both the number of responses and the percentage of responses in each category, male and female.

Table 2: Summary of Demographic Data
Requested of Student Respondents
(Number of Responses/Percentage of Responses)

		MALE	FEMALE
1) Sex of Respondent:		143/79%	37/21%
2) Do you live on a farm?	Yes	90/63%	21/57%
	No	53/37%	16/43%
(Note: percentage is expressed as % of male population or % of female population through the remainder of the demographic data).			
3) If "Yes", what type?	Crops	46/37%	11/34%
	Livestock	69/56%	19/59%
	Dairy	8/7%	2/6%
(Note: multiple markings were possible in this category)			
4) If "Yes", how large?			
	under 20 acres	29/32%	4/19%
	20 to 50 acres	21/23%	8/38%
	50 to 100 acres	9/10%	1/4%
	over 100 acres	31/34%	8/38%
5) Do you plan to work in agriculture after high school graduation?	Yes	98/69%	27/73%
	No	45/31%	10/27%
6) If "Yes", what area?			
	Production	44/45%	6/22%
	Business	13/13%	9/33%
	Mechanics	22/23%	0/0%
	Forestry	6/6%	1/4%
	Education	2/2%	4/15%
	Research	0/0%	2/7%
	Other	11/11%	5/19%
7) Years of vocational agriculture?			
	One year	2/1%	1/3%
	Two years	27/19%	16/43%
	Three years	114/80%	20/54%
8) Age?			
	15 Years	1/1%	1/3%
	16 Years	49/34%	19/51%
	17+ Years	93/65%	17/46%
9) Strongest area in Vo-Ag?			
	Leadership	24/17%	16/43%
	SOEP	21/15%	4/11%
	Plant Science	5/3%	5/14%
	Soil Science	3/2%	0/0%
	Animal Science	36/25%	12/32%
	Ag Mechanics	48/34%	0/0%
	Forestry	6/4%	0/0%
10) Weakest area in Vo-Ag?			
	Leadership	24/17%	2/5%
	SOEP	11/8%	1/3%
	Plant Science	30/21%	7/19%
	Soil Science	33/23%	2/5%
	Animal Science	1/1%	2/5%
	Ag Mechanics	9/6%	19/52%
	Forestry	35/24%	4/11%

The demographic data indicates that approximately 63-percent (63%) of the male respondents lived on a farm and 57-percent (57%) of the female student respondents lived on farms. Most of those respondents lived on livestock and crop-type farms, at either under 50 acres or over 100 acres in size. In response to the question regarding their plans to work in agriculture after high school graduation, 69-percent (69%) of the males and 73-percent (73%) of the females responded that they did have plans to work in agriculture after high school graduation. Males cited an occupational preference for production agriculture, mechanics, and ag-business, whereas females cited an occupational preference for ag-business, production agriculture, and education.

Most of the male students (80 %) were in their third year of vocational agriculture; female students were more evenly distributed between their third year and second year of vocational agriculture (54% and 43%, respectively). Male students tended to be a little older with 65-percent (65%) 17 years and older; female students had 51-percent (51%) at 16 years of age.

The self-perceived areas of strength in vocational agriculture for males appeared to be Agricultural Mechanics and Animal Science. Leadership and Animal Science were the self-perceived areas of strength in vocational agriculture for female students.

The strongest technical area of interest for females was Animal Science.

Those areas the male students perceived as their weakest in vocational agriculture were Forestry, Soil Science, Plant Science and Leadership. Females perceived their weakest areas to be Agricultural Mechanics and Plant Science (which included Horticulture skills). Forestry is taught in selected Oregon vocational agriculture programs located where Forestry provides a major income to the area serviced, so it was not surprising that a statewide distribution of students felt Forestry was a weak area.

Male/Female Competency Perceptions:

The second category of responses from vocational agriculture students dealt with self-assessed agricultural competency perceptions. Table three (3) presents data which identifies the mean scores that male and female students perceived for themselves by competency. The standard deviations around the mean scores for the groups and the result of the Separate t-Test analysis used to determine the statistical significance of those mean scores was also presented in Table three (3). Table three (3) appears on the following pages.

Table 3: Male Student vs Female Student Self-Assessed Perceptions of Competency Attainment and Separate t-Test Results

COMPETENCY	MALE		FEMALE		SEPARATE t-VALUE	P
	X	SD	X	SD		
<u>Leadership</u>						
1. Serve on a Committee	3.28	1.19	3.84	1.21	-2.50	0.15
2. Lead a Discussion	3.12	1.22	3.54	1.24	-1.85	0.07
3. Deliver a 3-8 Minute Speech to the Class	3.20	1.24	3.51	1.12	-1.47	0.15
4. Follow Rules When Introducing Others	3.32	1.01	3.78	0.96	-2.54	0.01*
5. Plan an FFA Activity	3.13	1.29	3.62	1.50	-1.85	0.07
6. Use Basic Parliamentary Procedure in Conducting a Meeting	3.27	1.27	3.59	1.34	-1.33	0.19
<u>SOEP & Agricultural Business</u>						
7. Keep a Financial Record	3.32	1.21	3.54	1.26	-0.97	0.34
8. Select an Agricultural Occupation	3.74	1.19	3.70	1.27	<u>0.17</u>	0.87
9. Develop an SOEP Which Leads to an Agricultural Occupation	3.27	1.30	3.25	1.32	<u>0.09</u>	0.93
<u>Plant Science</u>						
10. Differentiate Between Monocot and Dicot	2.78	1.57	2.84	1.48	-0.21	0.84
11. Match functions with Plant Parts	2.84	1.20	2.86	1.18	-0.12	0.91
12. Prepare and Plant a Seed Bed	3.59	1.19	3.50	1.25	<u>0.38</u>	0.71
13. Identify Commonly Grown Crops in the Area	3.90	1.06	3.54	1.02	<u>1.91</u>	0.06
14. Identify Common Weeds in the Area	3.19	1.14	3.11	1.26	<u>0.35</u>	0.73
15. Identify Common Insect Pests in the Area	3.01	1.08	2.46	0.99	<u>2.95</u>	0.00*
16. Identify Common Plant Diseases	2.19	1.11	2.03	1.08	<u>0.79</u>	0.43
17. Identify Commonly Used Landscape Trees, Shrubs and Ground Covers	2.69	1.24	2.81	1.10	-0.57	0.57
18. Read a Landscape Plan	2.38	1.23	2.38	1.23	-0.00	1.00
<u>Soil Science</u>						
19. Complete a Soil Sample Request Form	2.45	1.23	2.68	1.25	-0.99	0.32
20. Follow Fertilizer Recommendations	3.45	1.24	3.32	1.35	<u>0.50</u>	0.62
21. Identify Common Range- land Plants	2.89	1.09	2.56	1.23	<u>1.48</u>	0.14

Table 3 (continued)

COMPETENCY	MALE		FEMALE		SEPARATE t-VALUE	P
	X	SD	X	SD		
22. List Management Practices Used on Pasture	3.02	1.18	3.08	1.14	-0.28	0.78
23. Apply Soil Conservation Practices to Crop Production	2.93	1.23	2.95	0.97	-0.08	0.93
24. Identify Soil Texture	3.02	1.17	3.30	1.24	-1.22	0.23
<u>Animal Science</u>						
25. List Common Breeds of Livestock in the Area	4.10	1.06	4.22	1.03	-0.62	0.54
26. Identify the Body Parts of Beef, Sheep, Swine and Dairy Animals	3.80	1.05	4.06	1.07	-1.27	0.21
27. Present Oral Reasons for Livestock Selection	3.24	1.25	3.64	1.12	-1.84	0.07
28. Identify the Wholesale Cuts of Beef, Pork & Lamb	3.10	1.12	3.25	1.23	-0.65	0.52
29. Balance a Ration	3.08	1.23	3.28	1.16	-0.91	0.36
30. Match Nutrients with Their Functions, Sources, and Deficiency Symptoms	2.63	1.08	2.89	1.04	-1.33	0.19
31. Classify Animals According Simple or Ruminant Digestive Tract	3.13	1.35	3.22	1.53	-0.34	0.73
32. List Symptoms of Poor Animal Health	3.25	1.14	3.61	1.22	-1.62	0.11
33. Castrate, Dock, and Dehorn Livestock	3.80	1.34	3.44	1.48	<u>1.33</u>	0.19
34. Develop an Animal Health Calendar for Vaccination	3.00	1.28	3.42	1.20	-1.83	0.07
35. Identify Common Disease Symptoms	3.04	1.11	3.11	1.09	-0.37	0.71
36. Identify the Parts of the Reproductive Tract of a Cow	3.22	1.32	3.36	1.15	-0.62	0.54
37. Grade Livestock Based Upon USDA Quality and Yield Grade	2.88	1.21	3.31	1.09	-2.04	0.05*
<u>Agricultural Mechanics</u>						
38. Select a Fire Extinguisher for Each Class of Fire	3.24	1.43	2.44	1.34	<u>3.14</u>	0.00*
39. Identify Common Tools Used in Agricultural Mechanics	4.02	1.11	3.11	1.14	<u>4.30</u>	0.00*
40. Pass a General Shop Safety Test	4.34	1.01	3.47	1.36	<u>3.59</u>	0.00*
41. Arc Weld in Flat, Horizontal & Vertical Positions	3.82	1.22	2.69	1.41	<u>4.38</u>	0.00*
42. Weld, Braze and Cut with Oxyacetylene	3.76	1.22	2.44	1.27	<u>5.56</u>	0.00*

Table 3 (continued)

COMPETENCY	MALE		FEMALE		SEPARATE t-VALUE	P
	X	SD	X	SD		
43. Safely Operate Farm Equipment	4.20	1.01	3.20	0.96	<u>5.43</u>	0.00*
44. Perform Daily Maintenance Procedures on Tractors	3.85	1.21	2.50	1.23	<u>5.89</u>	0.00*
45. Read a Drawing of a Project to Construct in the Shop	3.92	1.03	2.69	1.21	<u>5.59</u>	0.00*
46. Complete a Bill of Materials for a Project	3.96	1.10	3.03	1.23	<u>4.13</u>	0.00*
47. Cut, Fit and Join Pipe	3.87	1.15	2.14	1.12	<u>8.21</u>	0.00*
48. Do Differential Leveling	2.79	1.27	1.95	1.13	<u>3.95</u>	0.00*
49. Use a Micrometer	2.97	1.35	1.95	1.20	<u>4.51</u>	0.00*
50. Service a Small Engine	3.75	1.15	1.73	1.12	<u>9.71</u>	0.00*
51. Identify Types of Electrical Circuit Protection Devices	2.97	1.18	1.84	1.01	<u>5.84</u>	0.00*
52. Survey a Home Farm for Unsafe Electrical Conditions	2.97	1.28	2.32	1.31	<u>2.68</u>	0.01*
53. Wire a Lighting Outlet Controlled by a Single Pole Switch	3.26	1.48	2.11	1.35	<u>4.53</u>	0.00*

NOTE: All competencies that males assessed higher have underlined t-Values.

All competencies that show a statistically significant probability at or beyond the 0.05 level are marked with a *.

For Leadership competencies (competencies one-six) only one competency was statistically significant: 4. "Follow rules when introducing others." As there was only one competency with statistical significance it would seem that a degree of equality has been reached in the area of Leadership.

SOEP and Agricultural Business mean scores (competencies seven-nine) were nearly identical for the two groups. Students perceive their skill in this taxonomy equally.

Plant Science competencies (competencies 10-18) had only one statistically significant difference occur for the group and that was competency number 15, where males rated their ability to "Identify common insects" higher than did the females. As there was only one competency with statistical significance, a level of equality appears close to being a reality for Plant Science competency attainment.

Soil Science (competencies 19-24) mean scores were similar for both groups. There were no statistically significant differences.

The competencies for Animal Science (competencies 25-37) were generally rated similarly for both female students and male students. Only one statistically significant difference occurred in this group: 37. "Grade livestock based upon USDA Quality and Yield Grade." Females rated their competency on this item

significantly higher than did their male counterparts. This competency rating and the identification of Animal Science as a strength area by female vocational agriculture students indicate that females are interested in and would like to work with animals.

Males rated every Agricultural Mechanics competency (competencies 38-53) significantly higher than did females. The figures were significant at and beyond the 0.01 probability level. It appears that this image of females in mechanics has not been overcome in the vocational agriculture curriculum.

Vocational Agriculture Instructor Response to

Competencies:

The same competencies the students used to assess themselves were assessed by the vocational agriculture instructors as to how they perceived competency skill ratings for their male and female students. Table four (4) presents this data as well as standard deviations around the mean scores and the result of the Paired t-Test analysis used to determine the statistical significance of those mean scores. Table four (4) appears on the following pages.

Table 4: Instructor's Perceptions of Their Male and Female Students Agricultural Competency Levels, Correlation Coefficients, and Paired t-Test Results

COMPETENCY	FEMALE		MALE		CORR	P	PAIRED	
	X	SD	X	SD			t-VALUE	P
<u>Leadership</u>								
1. Serve on a Committee	4.19	0.75	3.87	0.96	0.31	0.24	1.23	0.24
2. Lead a Discussion	3.69	0.95	3.94	0.77	0.43	0.10	-1.07	0.30
3. Deliver a 3-8 Minute Speech to the Class	3.56	1.03	3.69	0.87	0.65	0.01*	-0.62	0.54
4. Follow Rules When Introducing Others	3.47	0.91	3.27	0.59	0.67	0.01*	1.15	0.27
5. Plan an FFA Activity	4.40	0.51	4.13	0.74	0.42	0.12	1.47	0.16
6. Use Basic Parliamentary Procedure in Conducting a Meeting	4.06	1.00	4.06	0.93	0.86	0.00*	0.00	1.00
<u>SOEP and Agricultural Business</u>								
7. Keep a Financial Record	3.62	0.72	3.25	0.58	0.40	0.12	2.09	0.05
8. Select an Agricultural Occupation	4.27	0.46	4.07	0.59	0.72	0.00*	1.87	0.08
9. Develop an SOEP Which Leads to an Agricultural Occupation	4.06	0.77	3.81	0.83	0.74	0.00*	1.73	0.10
<u>Plant Science</u>								
10. Differentiate Between Monocot and Dicot	3.12	0.81	3.06	0.85	0.96	0.00*	1.00	0.33
11. Match Functions with Plant Parts	3.06	1.00	3.00	1.03	0.97	0.00*	1.00	0.33
12. Prepare and Plant a Seed Bed	3.75	0.93	3.62	0.96	0.86	0.00*	1.00	0.33
13. Identify Commonly Grown Crops in the Area	4.31	0.79	4.31	0.79	0.68	0.00*	0.00	1.00
14. Identify Common Seeds in the Area	3.50	1.09	3.56	1.03	0.80	0.00*	-0.37	0.72
15. Identify Common Insect Pests in the Area	2.81	0.83	2.69	0.60	0.80	0.00*	1.00	0.33
16. Identify Common Plant Diseases	2.56	0.89	2.50	0.82	0.96	0.00*	1.00	0.33
17. Identify Commonly Used Landscape Trees, Shrubs, and Ground Covers	2.25	1.00	2.19	0.98	0.97	0.00*	1.00	0.33
18. Read a Landscape Plan	2.19	1.22	2.06	1.24	0.96	0.00*	1.46	0.16
<u>Soil Science</u>								
19. Complete a Soil Sample Request Form	3.50	1.03	3.37	0.96	0.94	0.00*	1.46	0.16

Table 4 (continued)

COMPETENCY	FEMALE		MALE		CORR	P	PAIRED		
	X	SD	X	SD			t-VALUE	P	
20. Follow Fertilizer Recommendations	3.75	0.68	3.69	0.70	0.80	0.00*	0.56	0.58	
21. Identify Common Rangeland Plants	2.12	1.09	2.31	1.30	0.82	0.00*	-1.00	0.33	
22. List Management Practices Used on Pasture	3.06	0.93	3.19	0.98	0.79	0.00*	-0.81	0.43	
23. Apply Soil Conservation Practices to Crop Production	3.37	0.72	3.50	0.63	0.73	0.00*	-1.00	0.33	
24. Identify Soil Textures	4.06	0.57	4.00	0.73	0.80	0.00*	0.56	0.58	
<u>Animal Science</u>									
25. List Common Breeds of Livestock in the Area	4.81	0.40	4.69	0.70	0.95	0.00*	1.46	0.16	
26. Identify the Body Parts of Beef, Sheep, Swine and Dairy	4.56	0.63	4.31	0.79	0.83	0.00*	2.24	0.04*	
27. Present Oral Reasons for Livestock Selection	3.50	0.89	3.31	0.70	0.79	0.00*	1.38	0.19	
28. Identify the Wholesale Cuts of Beef, Pork, and Lamb	3.69	0.79	3.50	0.63	0.86	0.00*	1.86	0.08	
29. Balance a Ration	3.50	1.03	3.25	0.86	0.90	0.00*	2.24	0.04*	
30. Match Nutrients with Their Functions, Sources, and Deficiency Symptoms	3.44	0.81	3.31	0.79	0.81	0.00*	1.00	0.33	
31. Classify Animals According to Simple or Ruminant Digestive Tract	4.44	0.81	4.31	0.79	0.90	0.00*	1.46	0.16	
32. List Symptoms of Poor Animal Health	4.31	0.70	4.19	0.75	0.89	0.00*	1.46	0.16	
33. Castrate, Dock, and Dehorn Livestock	3.69	1.03	3.87	1.09	0.76	0.00*	-1.00	0.33	
34. Develop an Animal Health Calendar for Vaccination	3.69	0.87	3.62	0.96	0.89	0.00*	0.56	0.58	
35. Identify Common Disease Symptoms	3.81	0.75	3.62	0.81	0.87	0.00*	1.86	0.08	
36. Identify the Parts of the Reproduction Tract of a Cow	3.37	0.81	3.31	0.79	0.85	0.00*	0.56	0.58	
37. Grade Livestock Based Upon USDA Quality and Yield Grade	3.25	1.00	3.12	1.02	0.94	0.00*	1.46	0.16	
<u>Agricultural Mechanics</u>									
38. Select a Fire Extinguisher for Each Class of Fire	2.94	1.34	3.12	1.31	0.92	0.00*	-1.38	0.19	

Table 4 (continued)

COMPETENCY	FEMALE		MALE		CORR	P	PAIRED	
	X	SD	X	SD			t-VALUE	P
39. Identify Common Tools Used in Agricultural Mechanics	3.62	0.88	4.31	0.79	0.18	0.51	-2.55	0.02*
40. Pass a General Shop Safety Test	4.19	0.91	4.62	0.50	0.31	0.24	-1.96	0.07
41. Arc Weld in Flat, Horizontal and Verti- cal Positions	3.25	1.18	4.37	0.50	0.51	0.04*	-4.39	0.00*
42. Weld, Cut, and Braze with Acetylene	2.94	0.93	4.37	0.50	0.34	0.20	-6.45	0.00*
43. Safely Operate Farm Equipment	3.50	0.73	4.19	0.75	0.18	0.50	-2.91	0.01*
44. Perform Daily Maintenance Procedures on Tractors	3.31	1.08	4.31	0.70	0.48	0.06	-4.14	0.00*
45. Read a Drawing of a Project to Construct in the Shop	3.27	1.16	3.67	0.82	0.55	0.03*	-1.57	0.14
46. Complete a Bill of Materials for a Project	3.62	1.20	3.94	0.85	0.56	0.02*	-1.23	0.24
47. Cut, fit and Join Pipe	2.81	0.91	3.25	1.12	0.76	0.00*	-2.41	0.03*
48. Do Differential Leveling	3.31	1.35	3.62	1.15	0.64	0.01*	-1.16	0.26
49. Use a Micrometer	2.60	0.99	3.00	1.00	0.72	0.00*	-2.10	0.05
50. Service a Small Engine	2.87	1.09	4.00	0.63	0.58	0.02*	-5.08	0.00*
51. Identify Types of Electrical Circuit Protection Devices	2.25	1.06	2.81	1.11	0.55	0.03*	-2.18	0.04*
52. Survey Home Farm for Unsafe Electrical Conditions	3.12	1.02	3.19	0.91	0.76	0.00*	-0.37	0.72
53. Wire a Lighting Outlet Controlled by a Single Pole Switch	2.69	1.30	3.00	1.46	0.77	0.00*	-1.32	0.21

NOTE: * designates all statistically paired t-test values at the 0.05 probability level or greater.

There were no statistically significant differences between male and female vocational agriculture students as perceived by the vocational agriculture instructors for competencies in the Leadership, SOEP and Agricultural Business, Plant Science, and Soil Science groupings of competencies.

In Animal Science, instructors indicated a statistically significant difference in perceived competence between their male and female students for two areas: 26. "Identify the body parts of beef, sheep, swine and dairy"; 29. "Balance a ration." In both instances, female students' mean scores were higher than male students' mean scores.

Instructors did not perceive as much difference between male and female students in Agricultural Mechanics as did the students themselves. Instructors perceived male competency higher (statistically significant) than female students in only eight of the 16 competencies (numbers 39. "Identify common tools used in Agricultural Mechanics"; 41. "Arc weld in flat, horizontal and vertical positions"; 42. "Weld, cut, and braze with acetylene"; 43. "Safely operate farm equipment"; 44. "Perform daily maintenance procedures on tractors"; 47. "Cut, fit and join pipe"; 50. "Service a small engine"; 51. "Identify types of electrical circuit protection devices"). Students had perceived males higher than females in all 16 Agricultural Mechanics

competencies.

The correlations provided in Table four (4) show that 44 out of the 53 competencies listed had a strong positive correlation (>0.50) between male and female competency mean scores. This means that as one group's scores go up so does the other group's scores.

Male Student and Vocational Agriculture Instructor

Comparison:

Table five (5) presents those competencies which were statistically significant when comparing male student self-assessments for vocational agriculture competencies with their vocational agriculture instructors' ratings for male students on those same competencies.

Table 5: Self-Assessment Perceptions of Male Students as Compared to Vocational Agriculture Instructors' Perceptions of Male Students' Agricultural Competencies

COMPETENCY	TEACHER PERCEPTION OF				SEPARATE t-VALUE	P
	MALE STUDENT		MALE STUDENTS			
	X	SD	X	SD		
1. Serve on a Committee	3.28	1.19	3.94	0.97	-2.60	0.02*
2. Lead a Discussion	3.12	1.22	3.94	0.75	-3.95	0.00*
3. Deliver a 3-8 Minute Speech to the Class	3.20	1.24	3.71	0.85	-2.18	0.04*
5. Plan an FFA Activity	3.13	1.28	4.12	0.72	-4.77	0.00**+
6. Use Basic Parliamentary Procedure in Conducting a Meeting	3.27	1.27	4.16	0.90	-3.26	0.00*
9. Develop an SOEP Which Leads to an Agricultural Occupation	3.27	1.30	3.76	0.83	-2.15	0.04**+
15. Identify Common Insect Pests in the Area	3.01	1.08	2.65	0.61	2.09	0.05*
19. Complete a Soil Sample Request Form	2.45	1.23	3.35	0.93	-3.65	0.00**+
23. Apply Soil Conservation Practices to Crop Production	2.93	1.23	3.47	0.62	-2.95	0.01*
24. Identify Soil Textures	3.02	1.17	4.00	0.71	-4.95	0.00**+
25. List Common Breeds of Livestock in the Area	4.10	1.06	4.65	0.70	-2.86	0.01**+
26. Identify the Body parts of Beef, Sheep, Swine, and Dairy Animals	3.80	1.05	4.29	0.77	-2.37	0.03**+
30. Match Nutrients with Their Functions, Sources and Deficiency Symptoms	2.63	1.08	3.35	0.79	-3.43	0.00**+
31. Classify Animals According to Simple or Ruminant Digestive Tract	3.13	1.35	4.35	0.79	-5.53	0.00**+
32. List Symptoms of Poor Animal Health	3.25	1.14	4.18	0.73	-4.63	0.00**+
35. Identify Common Disease Symptoms	3.04	1.11	3.59	0.80	-2.58	0.02**+
41. Arc Weld in Flat, Horizontal and Vertical Positions	3.82	1.22	4.35	0.49	-3.41	0.00*
42. Weld, Braze, and Cut with Acetylene	3.76	1.22	4.35	0.49	-3.41	0.00*
44. Perform Daily Maintenance Procedures on Tractors	3.85	1.21	4.29	0.69	-2.30	0.03**+
47. Cut, Fit and Join Pipe	3.87	1.15	3.24	1.09	2.24	0.04**+

NOTE: The * indicates those competencies which had statistically significant t-test values at the 0.05 probability level or greater.

Those competencies with a + after the P (Probability) are the same ones with statistical probability found in vocational agriculture instructor vs female student (Table 6).

There were only two cases for which there was a statistically significant difference between student and instructor mean scores, where the instructor rated the student lower than the student's self-perception, and both of those instances were concerning male students (competencies 15. "Identify common insect pests in the area" and 47. "Cut, fit and join pipe").

In 18 cases vocational agriculture instructors rated male student competencies higher than did the male students themselves. This finding could be a significant sign of different values between the instructor's perception of the vocational agriculture student's competency skill level and that of the vocational agriculture student's self-perceived skill level. Further study should be done on this area.

Female Student and Vocational Agriculture Instructor

Comparison:

Table six (6) represents only those competencies which are statistically significant concerning the self-assessed perceptions of female students as compared to the vocational agriculture instructor's perceptions of female student's agricultural competencies.

Table 6: Self-Assessment Perceptions of Female Students as Compared to Vocational Agriculture Instructors' Perceptions of Female Students' Agricultural Competencies

COMPEENCY	TEACHER PERCEPTION				SEPARATE t-VALUE	P
	FEMALE STUDENT X	SD	OF FEMALE STUDENT X	SD		
5. Plan an FFA Activity	3.62	1.50	4.25	0.77	-2.01	0.05**+
8. Select an Agricultural Occupation	3.70	1.27	4.27	0.46	-2.36	0.02*
9. Develop an SOEP Which Leads to an Agricultural Occupation	3.25	1.32	4.06	0.77	-2.78	0.01**+
13. Identify Commonly Grown Crops in the Area	3.54	1.02	4.31	0.79	-2.98	0.01*
19. Complete a Soil Sample Request Form	2.68	1.25	3.50	1.03	-2.50	0.02**+
24. Identify Soil Textures	3.30	1.24	4.06	0.57	-3.06	0.00**+
25. List Common Breeds of Livestock in the Area	4.22	1.03	4.81	0.40	-3.02	0.00**+
26. Identify the Body Parts of Beef, Sheep, Swine and Dairy Animals	4.06	1.07	4.56	0.63	-2.13	0.04**+
30. Match Nutrients with Their Functions, Sources, and Deficiency Symptoms	2.89	1.04	3.44	0.81	-2.06	0.05**+
31. Classify Animals According to Simple or Ruminant Digestive Tract	3.22	1.53	4.44	0.73	-3.88	0.00**+
32. List Symptoms of Poor Animal Health	3.61	1.22	4.31	0.70	-2.60	0.01**+
35. Identify Common Disease Symptoms	3.11	1.09	3.81	0.75	-2.69	0.01**+
40. Pass a General Shop Safety Test	3.47	1.36	4.19	0.91	-2.22	0.03*
44. Perform Daily Maintenance Procedures on Tractors	2.50	1.23	3.31	1.08	-2.40	0.02**+
47. Cut, Fit and Join Pipe	2.14	1.12	2.81	0.91	-2.28	0.03**+
48. Do Differential Leveling	1.95	1.13	3.31	1.35	-3.54	0.00*
50. Service a Small Engine	1.73	1.12	2.87	1.09	-3.49	0.00*
52. Survey Home Farm for Unsafe Electrical Conditions	2.32	1.31	3.12	1.02	-2.39	0.02*

NOTE: the * indicates those competencies which had statistically significant t-test values at the 0.05 probability level or greater.

Those competencies with a + after the P (Probability) are the same ones with significant statistical probability found in the teacher male student perception vs male student self-perception table (Table 5).

Female students had 18 competencies on which vocational agriculture instructors rated their agricultural competencies above the students' self-assessment.

Significant Competency Groups Shared for Males and Females When Compared to Vocational Agriculture Instructors' Ratings:

Twelve agricultural competencies rated differently by students and the instructor were shared in common for both males and females from Tables five (5) and six (6). They were as follows:

5. Plan an FFA activity
9. Develop an SOEP which leads to an agricultural occupation
19. Complete a soil sample request form
24. Identify soil textures
25. List common breeds of livestock in the area
26. Identify the body parts of beef, sheep, swine, and dairy animals
30. Match nutrients with their functions, sources and deficiency symptoms
31. Classify animals according to simple or ruminant digestive tract
32. List symptoms of poor animal health
35. Identify common disease symptoms
44. Perform daily maintenance procedures on tractors
47. Cut, fit and join pipe

These competencies were from all of the competency

areas: Leadership-1; SOEP & Agricultural Business-1; Plant Science-1; Soil Science-2; Animal Science-6; Agricultural Mechanics-2.

Animal Science Strength Grouping:

Because female vocational agriculture students tended to rate Animal Science as their area of strength in the taxonomic areas evaluated, a comparison was done of those female students who rated Animal Science as their strength with those male vocational agriculture students who rated Animal Science as their strength.

Table seven (7) lists those nine competencies rated by the male and female students as being statistically significant in difference.

Table 7: Statistically Significant Competency t-Test Values for Female and Male Students Who Identified Animal Science as Their Strength

COMPETENCY	FEMALE		MALE		SEPARATE	
	X	SD	X	SD	t-VALUE	P
4. Follow Rules When Introducing Others	4.18	0.87	3.17	1.13	-3.13	0.00*
17. Identify Common Landscape Trees, Shrubs and Ground Covers	3.25	0.87	2.58	1.20	-2.08	0.05*
39. Identify Common Tools Used in Agricultural Mechanics	3.09	0.83	3.97	0.97	2.95	0.01*
43. Safely Operate Farm Equipment	3.18	0.75	4.17	0.91	3.61	0.00*
44. Perform Daily Maintenance Procedures on Tractors	2.36	1.12	3.81	1.16	3.70	0.00*
45. Read a Drawing of a Project to Construct in the Shop	2.73	1.10	3.86	1.09	2.98	0.01*
47. Cut, Fit and Join Pipe	2.36	1.12	3.81	1.09	3.76	0.00*
50. Service a Small Engine	1.67	0.89	3.58	1.13	6.03	0.00*
51. Identify Types of Electrical Circuit Protection Devices	1.75	1.22	2.74	1.08	2.48	0.02*

NOTE: The designation * means statistically significant at or beyond the 0.05 level

Of the nine competencies listed in Table seven (7), only two were not from the Agricultural Mechanics block of competencies. These findings were consistent with previous comparisons in this research. However, a considerable reduction in the total number of competencies with significant differences was achieved when selecting students with self-perceived similar strengths.

Agricultural Mechanics Weakness Grouping:

To extend the comparisons, another evaluation was done comparing male and female vocational agriculture

students who both identified Agricultural Mechanics as their weakest area. Those competencies which resulted in statistically significant differences were listed on Table eight (8).

Table 8: Competency t-Test Values for Female and Male Students Who Identified Agricultural Mechanics as Their Weakness

COMPETENCY	FEMALE		MALE		SEPARATE	
	X	SD	X	SD	t-VALUE	P
45. Read a Drawing of a Project to Construct in the Shop	2.28	0.96	3.44	1.13	2.66	0.02*
46. Complete a Bill of Materials for a Project	2.78	1.06	3.78	0.83	2.68	0.02*
50. Service a Small Engine	1.47	0.96	2.78	1.09	3.06	0.01*
51. Identify Types of Electrical Circuit Protection Devices	1.58	0.84	2.89	1.05	3.27	0.01*

NOTE: The designation * means statistically significant at or beyond the 0.05 level.

As shown on Table eight (8), there were only four competencies with statistically significant t-values when comparing female and male vocational agriculture students who both identified Agricultural Mechanics as their weak area. All of those competencies were from the Agricultural Mechanics block. A considerable reduction in significant differences between male and female students was achieved by identifying a student self-perceived weakness area.

As Tables seven (7) and eight (8) show, male and

female vocational agriculture students do not rate their competency level attainment much differently from each other when similar strengths and weaknesses are identified. This would also give validity to the theory that students are not rating themselves based on any innate sexual superiority.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary:

The purpose of this study was to investigate the sex-equity characteristics of vocational agriculture competency attainment in Oregon for male and female students of vocational agriculture classes. The purpose was also to ascertain whether males perceived their vocational agriculture competency level differently from females who shared the same vocational agriculture classroom and to compare male/female student perceptions of competency attainment with vocational agriculture instructor perceptions of competency attainment for each group.

The specific objectives of the study were as follows:

1. Identify self-assessed agricultural competency perceptions for juniors and other students in Agriculture III of vocational agriculture programs in Oregon.

2. Determine if differences in perceived competency level attainment exists between male and female students in the junior level Agriculture III class of vocational agriculture programs in Oregon.

3. Identify agricultural competency levels of male and female junior vocational agriculture students as perceived by their vocational agriculture instructors in Oregon.

4. Determine if differences in agricultural

competency level attainment exist for male and female students as perceived by their vocational agriculture instructors in Oregon.

5. Determine if male and female students perceive their agricultural competency attainment differently than do their vocational agriculture instructors.

The responses to the instruments were analyzed statistically in a contrasting direction using the Paired t-Test and Separate t-Test procedures.

Conclusions:

The conclusions are listed by research hypothesis (null).

Null Hypothesis Number One (1):

There is no statistically significant difference in the self-perceived competency level attainment between male and female students in Junior-level Agriculture III classes of vocational agriculture in Oregon.

Conclusion:

A significant difference in self-perceived male and female vocational agriculture competency level attainment exists in the Agricultural Mechanics taxonomy for Oregon Vocational Agriculture programs at the Junior (Agriculture III) level.

Support for the Conclusion:

A) Twenty of the 53 selected competencies (38%) were rated significantly higher by male students as compared to female students; these competencies were in the areas of

Agricultural Mechanics and Plant Science.

B) Female students rated only two competencies (4%) significantly higher than did male students; these competencies were in the areas of Leadership and Animal Science.

C) All but three (3) competency differences of a statistical significance were in the Agricultural Mechanics taxonomy in which males rated their competence higher than females in each of the 18 Agricultural Mechanics competencies listed.

Recommendation:

A) Oregon Vocational Agriculture instructors should work towards increasing female student competence in Agricultural Mechanics through increased emphasis on participation in that portion of the curriculum and maintaining similar expectations of females and males in the Agricultural Mechanics portion of the curriculum.

Null Hypothesis Number Two (2):

There is no statistically significant difference in the agricultural competency level attainment for male and female students in Junior-level Ag II classes of vocational agriculture programs in Oregon as perceived by their vocational agriculture instructors.

Conclusion:

Oregon Vocational Agriculture instructors rate their male and female students significantly different in competency level attainment in the Agricultural Mechanics

taxonomy for Oregon Vocational Agriculture programs at the Junior (Agriculture III) level.

Support for the Conclusion:

A) Male vocational agriculture students were rated higher on 8 competencies (15%) by their vocational agriculture instructors; all eight of the 10 competencies male students were rated higher on by their vocational agriculture instructors were in Agricultural Mechanics portion of the curriculum.

B) Female vocational agriculture students were rated significantly higher on two competencies (4%) by their vocational agriculture instructors; these were in the Animal Science portion of the curriculum.

Recommendation:

Vocational agriculture instructors see similar inequities in competency attainment as their Junior (Agriculture III) level students but not to the same degree, therefore they should work towards increasing female student competency in Agricultural Mechanics through increased emphasis on participation and by maintaining similar expectations of female and male students in the Agricultural Mechanics portion of the curriculum.

Null Hypothesis Number Three (3):

There is no statistically significant difference in the self-perceived competency level attainment of male and female students in Junior-level Agriculture III classes of

vocational agriculture programs in Oregon as compared with their vocational agriculture instructor's perceptions of their student's competency level attainment.

Conclusion:

Vocational agriculture instructors perceived the level of competency attainment higher for most of the vocational agriculture competencies than do their students on the student self-perception scales.

Support for the Conclusion:

A) Thirty-four percent (34%) (or 18) of the 53 competencies were perceived statistically significant by the vocational agriculture instructors than the male students.

B) Thirty-four percent (34%) (or 18) of the competencies were perceived higher at a statistically significant level by the instructors for female students than the female students.

Recommendation:

A) A study should be done to measure student perceptions and instructor perceptions of competency attainment, followed by an actual test to determine which group was the closest.

B) A major learning theory is that students tend to achieve to instructor expectation levels; therefore it may be advantageous for instructors to have higher levels of perceived student competency attainment than students, and perhaps instructors should be encouraged to continue in

this vein.

Further Recommendations:

1. Several questions can be posed from this study: "Where do students get these interest areas which motivate them to develop certain strengths and weaknesses, thus causing them to gain (or not to gain) specific competencies?"

-- "What were the direct and indirect influences outside the classroom that directed motivation toward specific competencies?" -- "What, if any, influence does the vocational agriculture instructor have in altering this trend towards specificity?" These questions were beyond the scope of this study but may be appropriate for other studies.

2. The technique used in this study should be refined and used in other vocational program areas in Oregon. Sex equity is an important issue and every effort should be made to determine whether equity exists, especially in the vocational areas of a school's curriculum which have a strong influence in students' future plans. Corrections should be made where they are appropriate.

3. A study should be formulated to determine the source of interests and motivations for male and female vocational agriculture students by taxonomy. Perhaps vocational agriculture as a subject is too broad, and a major reason for inequity is interest area rather than

sex.

4. It should be determined if the students trained in Agricultural Mechanics are employed on the basis of sex differences.

5. In two or three years a similar but refined study should be conducted among Oregon's Vocational Agriculture instructors. It should be determined if progress toward the goal of full equity has been made.

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Appendix

APPENDIX A

Dear VoAg Instructor:

I am working on my thesis and need your help: If I sent you a package of questionnaires for each of your Juniors to complete and one for yourself would you have them completed and returned to me?

One way or the other, please return this card in the enclosed envelope.

I would be willing to assist you _____

I have _____ Juniors in my program.

I would NOT be willing to assist you _____

APPENDIX B

VO-AG SELF-ASSESSMENT

Hello. Please read these instructions completely before turning the page.

The next few pages list a variety of Agricultural Competencies commonly experienced by high school juniors. Please read each one and then circle the level YOU feel represents the level of YOUR competence for that task. Here are two examples:

E1. List characteristics of a
good leader 1 2 3 4 ⑤

By circling "5" you are saying that you are "Very Competent" at this task.

E2. Label the parts of a plant
① 2 3 4 5

By circling "1" you are saying that you have "No Competence" at this task.

Answer each one with your self-assessment on the one-to-five scale. Remember, you are evaluating yourself.

The last page is an Information Sheet. Please answer each question as it applies to you. Thank you.

	Competence			Level	
	None			High	
	1	2	3	4	5
1. Serve on a committee	1	2	3	4	5
2. Lead a discussion	1	2	3	4	5
3. Deliver a 3-8 minute speech to the class	1	2	3	4	5
4. Follow rules when introducing others	1	2	3	4	5
5. Plan an FFA activity	1	2	3	4	5
6. Use basic Parliamentary Procedure in conducting a meeting	1	2	3	4	5
7. Keep a financial record	1	2	3	4	5
8. Select an Agricultural occupation	1	2	3	4	5
9. Develop an SOEP which leads to an Agricultural occupation	1	2	3	4	5
10. Differentiate between Monocot and Dicot	1	2	3	4	5
11. Match functions with plant parts	1	2	3	4	5
12. Prepare and plant a seed bed	1	2	3	4	5
13. Identify commonly grown crops in the area	1	2	3	4	5
14. Identify common weeds in the area	1	2	3	4	5
15. Identify common insect pests in the area	1	2	3	4	5
16. Identify common plant diseases	1	2	3	4	5
17. Identify commonly used landscape trees, shrubs and ground covers	1	2	3	4	5
18. Read a landscape plan	1	2	3	4	5
19. Complete a soil sample request form	1	2	3	4	5
20. Follow fertilizer recommendations	1	2	3	4	5
21. Identify common rangeland plants	1	2	3	4	5
22. List management practices used on pastures	1	2	3	4	5

	Competence Level				
	None				High
23. Apply soil conservation practices to crop production	1	2	3	4	5
24. Identify soil textures	1	2	3	4	5
25. List common breeds of livestock in the area	1	2	3	4	5
26. Identify the body parts of beef, sheep, swine and dairy animals	1	2	3	4	5
27. Present oral reasons for livestock selection	1	2	3	4	5
28. Identify the wholesale cuts of beef, pork and lamb	1	2	3	4	5
29. Balance a ration	1	2	3	4	5
30. Match nutrients with their functions, sources, and deficiency symptoms	1	2	3	4	5
31. Classify animals according to simple or ruminant digestive tract	1	2	3	4	5
32. List symptoms of poor animal health	1	2	3	4	5
33. Castrate, dock, and dehorn livestock	1	2	3	4	5
34. Develop an animal health calendar for vaccination	1	2	3	4	5
35. Identify common disease symptoms	1	2	3	4	5
36. Identify the parts of the reproductive tract of a cow	1	2	3	4	5
37. Grade livestock based upon USDA Quality and Yield grade	1	2	3	4	5
38. Select a fire extinguisher for each class of fire	1	2	3	4	5
39. Identify common tools used in agricultural mechanics	1	2	3	4	5
40. Pass a general shop safety test	1	2	3	4	5
41. Arc weld in flat, horizontal and vertical positions	1	2	3	4	5

	Competence Level				
	None				High
42. Weld, braze, and cut with oxyacetylene	1	2	3	4	5
43. Safely operate farm equipment	1	2	3	4	5
44. Perform daily maintenance procedures on tractors	1	2	3	4	5
45. Read a drawing of a project to construct in the shop	1	2	3	4	5
46. Complete a bill of materials for a project	1	2	3	4	5
47. Cut, fit and join pipe	1	2	3	4	5
48. Do a differential leveling	1	2	3	4	5
49. Use a micrometer	1	2	3	4	5
50. Service a small engine	1	2	3	4	5
51. Identify types of electrical circuit protection devices	1	2	3	4	5
52. Survey home farm for unsafe electrical conditions	1	2	3	4	5
53. Wire a lighting outlet controlled by a single pole switch	1	2	3	4	5

INFORMATION SHEET

1. Sex: Male _____ Female _____
2. Do you live on a farm? Yes _____ No _____
 If "Yes", what type? Crops _____ Livestock _____
 Dairy _____
 How large? Under 20 acres _____ 20-50 acres _____
 50-100 acres _____ Over 100 acres _____
3. Do you plan to work in Agriculture after high school?
 Yes _____ No _____
 If "Yes", in what area: Ag Production _____
 Ag Business _____ Ag Mechanics _____ Forestry _____
 Ag Education _____ Ag Research _____ Other Ag area _____
4. How many years of VoAg have you had in school:
 One _____ Two _____ Three _____
5. How old are you? 14 _____ 15 _____ 16 _____ 17 _____
6. What is your strongest area in VoAg?
 Leadership _____ SOEP _____ Plant Science _____
 Soil Science _____ Animal Science _____
 Ag Mechanics _____ Forestry _____
7. What is your weakest area in VoAg?
 Leadership _____ SOEP _____ Plant Science _____
 Soil Science _____ Animal Science _____
 Ag Mechanics _____ Forestry _____

APPENDIX C

Dear VoAg Instructor:

Thank you for agreeing to assist me with this project.

Enclosed you will find enough copies for each of your Junior-level students as per the number you put on the response card. Also, you will find one set of "instructors Assessment" for your use. Please distribute the student copies to your Junior-level students and, while they respond to their assessment individually, take some time and complete yours. Once they are all completed please put them in the enclosed stamped envelope and mail them back to me.

Note: this assessment is voluntary and anonymous. Other than an ID number written on the return envelope, names and other personal information are not needed or wanted; this includes name of school or Ag Department. The only information used in the developing, producing and printing of this thesis is that information in the assessment packets and the student information sheet. This is to be in no way construed as a program evaluation or assessment.

Thank you for your time and assistance.

Sincerely yours,

M. "Zip" Krummel
VoAg Instructor

Dr. Lee Cole
Head, AgEd

INSTRUCTORS ASSESSMENT

Please read these instructions before turning the page.

The next few pages list a variety of Agricultural Competencies commonly experienced by high school Juniors. Please read each one and then circle the level you feel represents the level of your Junior females' and Junior males' average level of competence for that task. Here are two examples:

	Female	Male
E1. List characteristics of a good leader	1 2 3 4 ⑤	1 ② 3 4 5

By circling as shown you are saying you feel that your Junior females are "Very Competent" at that task and your Junior males "Slightly Competent."

E2. Label the parts of a plant	① 2 3 4 5	1 2 3 4 ⑤
--------------------------------	-----------	-----------

By circling as shown you are saying you feel that your Junior females have "No Competence" at that task and your Junior males are "Very Competent."

Answer each one with your assessment on the one-to-five scale. Remember, you are evaluating your Junior females and Junior males as individual groups for each task.

	Female					Male				
	Competence Level					Competence Level				
	None			High	None			High		
1. Serve on a committee	1	2	3	4	5	1	2	3	4	5
2. Lead a discussion	1	2	3	4	5	1	2	3	4	5
3. Deliver a 3-8 minute speech to the class	1	2	3	4	5	1	2	3	4	5
4. Follow rules when introducing others	1	2	3	4	5	1	2	3	4	5
5. Plan an FFA activity	1	2	3	4	5	1	2	3	4	5
6. Use basic Parliamentary Procedure in conducting a meeting	1	2	3	4	5	1	2	3	4	5
7. Keep a financial record	1	2	3	4	5	1	2	3	4	5
8. Select an Agricultural occupation	1	2	3	4	5	1	2	3	4	5
9. Develop an SOEP which leads to an Agricultural occupation	1	2	3	4	5	1	2	3	4	5
10. Differentiate between Monocot and Dicot	1	2	3	4	5	1	2	3	4	5
11. Match functions with plant parts	1	2	3	4	5	1	2	3	4	5
12. Prepare and plant a seed bed	1	2	3	4	5	1	2	3	4	5
13. Identify commonly grown crops in the area	1	2	3	4	5	1	2	3	4	5
14. Identify common weeds in the area	1	2	3	4	5	1	2	3	4	5
15. Identify common insect pests in the area	1	2	3	4	5	1	2	3	4	5
16. Identify common plant diseases	1	2	3	4	5	1	2	3	4	5
17. Identify commonly used landscape trees, shrubs and ground covers	1	2	3	4	5	1	2	3	4	5
18. Read a landscape plan	1	2	3	4	5	1	2	3	4	5

	Female					Male				
	None	Competence Level				None	High			
19. Complete a soil sample request form	1	2	3	4	5	1	2	3	4	5
20. Follow fertilizer recommendations	1	2	3	4	5	1	2	3	4	5
21. Identify common rangeland plants	1	2	3	4	5	1	2	3	4	5
22. List management practices used on pasture	1	2	3	4	5	1	2	3	4	5
23. Apply soil conservation practices to crop production	1	2	3	4	5	1	2	3	4	5
24. Identify soil textures	1	2	3	4	5	1	2	3	4	5
25. List common breeds of livestock in the area	1	2	3	4	5	1	2	3	4	5
26. Identify the body parts of beef, sheep, swine and dairy animals	1	2	3	4	5	1	2	3	4	5
27. Present oral reasons for livestock selection	1	2	3	4	5	1	2	3	4	5
28. Identify the wholesale cuts for beef, sheep, and swine	1	2	3	4	5	1	2	3	4	5
29. Balance a ration	1	2	3	4	5	1	2	3	4	5
30. Match nutrients with their functions, sources, and deficiency symptoms	1	2	3	4	5	1	2	3	4	5
31. Classify animals according to simple or ruminant digestive tract	1	2	3	4	5	1	2	3	4	5
32. List symptoms of poor animal health	1	2	3	4	5	1	2	3	4	5
33. Castrate, dock, and dehorn livestock	1	2	3	4	5	1	2	3	4	5
34. Develop an animal health calendar for vaccination	1	2	3	4	5	1	2	3	4	5

	Female					Male				
	None	Competence Level				None	High			
35. Identify common livestock disease symptoms	1	2	3	4	5	1	2	3	4	5
36. Identify the parts of the reproductive tract of a cow	1	2	3	4	5	1	2	3	4	5
37. Grade livestock based upon USDA Quality and Yield grade	1	2	3	4	5	1	2	3	4	5
38. Select a fire extinguisher for each class of fire	1	2	3	4	5	1	2	3	4	5
39. Identify common tools used in agricultural mechanics	1	2	3	4	5	1	2	3	4	5
40. Pass a general shop safety test	1	2	3	4	5	1	2	3	4	5
41. Arc weld in flat, horizontal and vertical positions	1	2	3	4	5	1	2	3	4	5
42. Weld, braze, and cut with oxyacetylene	1	2	3	4	5	1	2	3	4	5
43. Safely operate farm equipment	1	2	3	4	5	1	2	3	4	5
44. Perform daily maintenance procedures on tractor	1	2	3	4	5	1	2	3	4	5
45. Read a drawing of a project to construct in the shop	1	2	3	4	5	1	2	3	4	5
46. Complete a bill of materials for a project	1	2	3	4	5	1	2	3	4	5
47. Cut, fit and join pipe	1	2	3	4	5	1	2	3	4	5
48. Do differential leveling	1	2	3	4	5	1	2	3	4	5
49. Use a micrometer	1	2	3	4	5	1	2	3	4	5
50. Service a small engine	1	2	3	4	5	1	2	3	4	5

	Female					Male				
	None	Competence Level			High	None	Competence Level			High
	1	2	3	4	5	1	2	3	4	5
51. Identify types of electrical circuit protection devices	1	2	3	4	5	1	2	3	4	5
52. Survey home farm for unsafe electrical conditions	1	2	3	4	5	1	2	3	4	5
53. Wire a lighting outlet controlled by a single pole switch	1	2	3	4	5	1	2	3	4	5