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A Study to Determine the Importance of Pre-service Training in Teaching Farm Mechanics Jobs in Vocational Agriculture

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A STUDY TO DETERMINE THE IMPORTANCE OF PRE-SERVICE TRAINING IN TEACHING FARM MECHANICS JOBS IN VOCATIONAL AGRICULTURE

By

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in partial fulfillment of the requirements for the
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To successfully conduct his classes a teacher of vocational agriculture must have an understanding of many concepts and the ability to do many jobs. This is especially true in the farm mechanics field. Farms today are mechanized to a stage which would have been termed impossible two generations ago. Every farmer is by necessity a mechanic and an engineer.

In training the farmers of tomorrow it is the responsibility of the vocational agriculture teacher to prepare the boys to meet the challenge of this mechanized age of farming. Present complexity, new machines, new problems, and new skills to be learned and acquired are challenges which must be met by the teacher and the boy to make him a better farmer than his father before him.

In teaching farm mechanics there are hundreds of major and minor skills in which a teacher must be proficient. How to best acquire these skills is of concern to all. They will not all be acquired before college nor is there time in college to give training in all these skills. Certainly a teacher cannot be expected to acquire these skills while teaching.

From the writer's own experience and in talking with teachers of vocational agriculture, it is quite probable

there are areas and jobs in which the training is inadequate on the college level. There are, of course, limitations on the time that can be spent in farm mechanics courses in college. Also to be considered is the fact that many instructors have had training in certain job areas before entering college. Where a great majority have this training it would seem inefficient to require it in college.

Further, have the college courses in farm mechanics kept pace with the increased mechanization of the modern farm? As progress is made courses will become obsolete and must be discontinued. New ones, to better fill the need, will be added to the curriculum.

A teacher of vocational agriculture is expected to be proficient in a broad field of farm mechanics jobs and related abilities. How best to meet that requirement is the planned outcome of this study.

Purpose

The purpose of this study is to determine the importance of pre-service training in farm mechanics jobs for college students majoring in vocational agriculture.

After completing this study the writer will attempt to answer the following questions:

1. From the standpoint of the vocational agriculture instructor teaching them, how important are various jobs in farm mechanics?
2. Where have teachers acquired the ability to do

these various jobs, before college, in college, or while teaching?

3. Which of these jobs should be taught in college courses to agricultural education majors?

REVIEW OF LITERATURE

In checking various publications and data not a great deal was found which closely resembles this study. One study conducted in South Dakota deals briefly with the farm mechanics enterprises, and another conducted in the North Atlantic Region covers approximately the same areas as this study but in greater detail.

Generally speaking, in regard to the content of college courses for farm mechanics, Cook, Walker and Snowden[1] have this to say:

> The course content of farm mechanics courses should provide farm mechanics experiences which are true to life and which will train the individual for farm mechanics jobs he will have to do as a teacher of vocational agriculture. Few, if any, agricultural educators will question the importance of farm mechanics in the instructional program in vocational agriculture. While there is little common agreement among the various states as to the relative emphasis that should be given to farm mechanics training, there is, however, a growing concept that adequate teacher preparation should be given for teaching all phases of farm mechanics. It has been repeatedly pointed out by agricultural educators that the teacher of vocational agriculture should be proficient in a broad field of farm mechanics.

From the above statement it is apparent that the jobs and skills that the instructor must be familiar with are many. Also, training in these skills and jobs should be provided by the college unless all prospective teachers get this training from some other source.

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(1). Cook, G. E., Walker, Clyde and Snowden, Obed L., Practical Methods in Teaching Farm Mechanics, Danville, Illinois, The Interstate, 1952, p. 35.

Phipps and Cook[1] warn against including jobs that will not contribute to the students' proficiency in farming. They further state that the mechanical abilities necessary for farming are so numerous that all cannot be taught anyway. Content of doubtful value on farms should be eliminated from the courses in vocational agriculture.

Sundet[2] made an extensive study of undergraduate training in technical agriculture received by instructors of vocational agriculture in South Dakota. Included in this study was a list of abilities in the farm mechanics area. This study compared the abilities of those trained in South Dakota with those trained outside the state, but also brought out the source of training, that is, college training, experience before graduation and experience after graduation. Generally, the indication was that those trained in other states received more thorough training in farm mechanics than did those in South Dakota. Sundet had the following to say about the comparison:

With the large numbers of abilities listed, regarding the farm mechanics enterprise in Table XXXIV, it is difficult to note any definite trends. In the columns under "Experience after graduation", the percentages are higher for South Dakota State College graduates in 25 out of the 37 abilities listed. From this it may be assumed that out-of-state

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(1). Phipps, Lloyd J., and Cook, Glen C., Handbook on Teaching Vocational Agriculture, Danville, Illinois, The Interstate, 1959, p. 700.

(2). Sundet, Stanley A., "Undergraduate Training in Technical Agriculture Received by Instructors of Vocational Agriculture in South Dakota", M.S. Thesis Submitted to Faculty of Iowa State College, (1939).

graduates are better informed in the abilities in the farm mechanics enterprise than are the South Dakota State College graduates.

In his summary Sundet[1] had this to say about the abilities listed in farm mechanics:

There are six abilities in this enterprise which were inadequately covered in college. They are, "Farm lighting systems", "Rural electrification", "Construct silos", Measure land", "Make a stitched splice (harness)", and "Build small farm buildings".

Ahalt and Miller[2] conducted a study in the North Atlantic Region. It dealt with 205 farm mechanic skills listed in seventeen groups. This list was sent out to a random sample of approximately one-fourth of the vocational agriculture teachers in that region. Of the 292 lists mailed 132 (45.2 per cent) were returned. The form was similar to the one used by the writer except that each skill was rated as to the value: high, medium or low. Also, a column was provided for checking if an instructor used this particular skill. Under "where trained" a fourth column was added, "in Vo-Ag". Ahalt and Miller summarize their study thus:

This study shows that the most important groups of skills in farm mechanics, when judged by the number of teachers who used the skills are cold metal, woodworking, soldering and sheet metal, glazing, painting and refinishing, tool-fitting and farm machinery, in that order. When judged by the average number of high value ratings teachers gave the skills the order of importance is farm machinery, tractors and gas engines, cold metal, tool-fitting, woodworking, and

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(1). Ibid. p.88.
(2). Ahalt, Arthur M. and Miller, Harry T., "Technical Skills Needed in Farm Mechanics", The Agricultural Education Magazine, XXVII, January, 1955, p. 160-164.

electric arc welding. Teachers included in this survey tended to use, and gave a high value rating, to the more common and less technical skills in all groups.

Most training for skills was obtained by the teachers as a whole on the job, followed closely by that received in college. Training received on the farm as a boy was third, and that received in Vo-Ag classes was lowest. About half of all training of teachers with more than 10 years of experience was gotten on the job, while the younger teachers received most of their training in college, with "on the job" being next. No doubt older teachers have had to get much training on the job because many new skills have been developed in farm mechanics since they attended college, which emphasizes the need for in-service training for teachers. The low amount of training teachers received in Vo-Ag classes is at least partially due to the fact that many teachers included in the survey did not take Vo-Ag in high school.

The rapid changes taking place in farm mechanics means new skills will be added rapidly to those included in this study, and some skills now in use may gain or lose importance in a short period of time. However, the basic findings in this study are of such a nature that they would be of considerable value for some time in the future.

PROCEDURE

First, a list of jobs and skills in the area of farm mechanics was compiled. This list does not include every job performed in farm mechanics but represents the major jobs in this area. There are perhaps jobs and skills that could have been added or left out, but the writer considered this representative of the jobs taught.

Next, a letter of explanation, as found in Appendix A, and a survey sheet, as found in Appendix B, were designed to be sent out to the teachers of agriculture. The survey sheet has eighty-two jobs listed with three areas under each job. Each area has an appropriate number of answers which each teacher was asked to check.

The first area was "Importance". This refers to the place of the job in the agricultural program. Under importance the instructors were asked to check one of the following columns: "always taught", "taught at times", and "never taught". If a job is a part of a definite teaching plan and is taught to every agricultural student the instructor was to check "always taught". If a job is taught only as the need arises and is not taught to every agricultural student the instructor was to check "taught at times". Likewise, a job which is never taught was to be checked under the "never taught" column. The second category "Ability Acquired" refers to the manner in which the instructor received his training

in this particular job. The three possible places of training are "before college", "in college", and "while teaching".

The last category is the question, "Should this job be taught in college courses to Ag Ed Majors?". Under this category the instructors were asked to check "Yes" or "No".

This survey sheet was sent out to sixty-six teachers of agriculture in South Dakota which comprised the present active teachers with at least one year of teaching experience. Of the sixty-six survey sheets mailed out forty-seven of them (71.2 per cent) were returned within three weeks. A card was then sent out to remind those who had not returned the sheet. Fifteen more survey sheets were returned making a total of sixty-two (93.9 per cent).

The results were checked and tabulated. The totals under each of the three columns may not total sixty-two as some of the teachers did not answer some items. Also, under "Ability Acquired" quite a number checked more than one column. This is understandable, for many of the teachers would have a portion of the training from two or perhaps all three of the sources.

To test the significance of jobs under "Importance" and "Should This be Taught in College Courses to Ag Ed Majors?" the Chi-square test was used.

Chi-square is a statistic used for testing hypotheses. It is applicable for these two areas in that the sampling distribution is known, and it is desirable to test the

departure of observed frequency in a given sample from the frequencies we would expect to obtain on the basis of a given hypothesis.

The formula for determining the Chi-square number is as follows:

$$X^2 = \sum \frac{(o - e)^2}{e}$$

where X^2 = Chi-square

o = the observed frequency.

e = the corresponding expected frequency in terms of the hypothesis.

RESULTS OF THE STUDY

The basic findings of this study as presented in this section will be treated as areas: "Importance", "Ability Acquired" and "Should This be Taught in a College Course to Agricultural Education Majors?".

Considering the first area, "Importance", the writer was aware that some arbitrary point must be established to determine the significance of the various jobs. As explained in the section on Procedure the Chi-square test of significance was applied to each item. This Chi-square number was converted by using a table which gives the per cent of probability with certain degrees of freedom. Importance, having three answerable sections would have two degrees of freedom (degrees of freedom = n - 1). Referring to a table to convert Chi-square to a level of probability it is noted that, with two degrees of freedom, a Chi-square number of 5.991 or more indicates significance at the five per cent level of probability.

Referring then to the jobs under "Importance", from Table I it is noted that practically every job is significant at the five per cent level. Those jobs which are not significant at the five per cent level are item 11 (using tables on the carpenter's square), item 13 (understanding the diesel motor), item 52 (knowing the parts of the forge), item 54 (maintaining a forge fire), item 55 (proper use of tongs),

TABLE I

VALUE OF CHI-SQUARE

AND LEVEL OF PROBABILITY FOR ITEMS UNDER "IMPORTANCE"

ITEM NO.	CHI-SQUARE	PROBABILITY	ITEM NO.	CHI-SQUARE	PROBABILITY
1	102.1	.01	42	33.6	.01
2	80.4	.01	43	29.7	.01
3	56.9	.01	44	36.1	.01
4	18.3	.01	45	38.2	.01
5	15.8	.01	46	9.2	.01
6	14.8	.01	47	25.9	.01
7	22.9	.01	48	21.4	.01
8	22.3	.01	49	21.7	.01
9	10.9	.01	50	20.8	.01
10	69.3	.01	51	24.6	.01
11	5.7	.10	52	4.7	.10
12	35.6	.01	53	6.9	.05
13	3.1	.30	54	5.2	.10
14	28.9	.01	55	3.7	.30
15	34.9	.01	56	1.6	.50
16	6.5	.05	57	3.1	.30
17	18.4	.01	58	27.9	.01
18	32.7	.01	59	2.5	.30
19	17.2	.01	60	5.7	.10
20	7.6	.05	61	36.8	.01
21	38.5	.01	62	13.8	.01
22	16.7	.01	63	28.9	.01
23	10.9	.01	64	33.2	.01
24	56.4	.01	65	69.0	.01
25	55.5	.01	66	32.9	.01
26	70.2	.01	67	40.1	.01
27	13.5	.01	68	27.7	.01
28	11.8	.01	69	25.7	.01
29	24.5	.01	70	34.4	.01
30	27.2	.01	71	23.6	.01
31	6.3	.05	72	18.4	.01
32	65.6	.01	73	4.4	.20
33	39.5	.01	74	12.2	.01
34	14.1	.01	75	7.6	.05
35	15.7	.01	76	60.7	.01
36	32.5	.01	77	60.8	.01
37	29.2	.01	78	60.0	.01
38	23.0	.01	79	5.3	.10
39	31.0	.01	80	6.8	.05
40	32.9	.01	81	11.2	.01
41	28.6	.01	82	7.6	.05

item 56 (tempering), item 57 (drawing, upsetting and twisting), item 59 (knowing types of metals), item 60 (using flux), item 73 (figuring wire sizes and loading), and item 79 (operating a turning lathe). These 11 jobs out of the 82 were not deemed important enough to be included at all times in teaching farm mechanics. The other 71 jobs listed are always taught, or taught at times in the majority of the departments.

When considering the "Ability Acquired" area of the survey sheet, the fact that many instructors checked more than one column made the Chi-square test of significance impractical. The instructors checking more than one column considered their training in the job as being from two or perhaps three sources. As a result the tabulations for this area are given in Table II in the actual number of instructors checking each column.

To get a more accurate basis for checking the source of training the jobs were divided into ten groups. These groups were carpentry, motors, welding, concrete work, rope work, glazing and puttying, forge work, soldering, electricity and operating power equipment. The percentage of training from each of the three possible sources for each of the groups was tabulated and converted to a percentage figure. These percentages are given in Table III.

In considering the percentage figures under the column "per cent before college" in Table III it is quite

TABLE II

NUMBER OF INSTRUCTORS RECEIVING

TRAINING FROM THREE DIFFERENT SOURCES

ITEM NO.	BEFORE COLLEGE	IN COLLEGE	WHILE TEACHING	ITEM NO.	BEFORE COLLEGE	IN COLLEGE	WHILE TEACHING
1	33	21	23	42	16	12	34
2	40	14	22	43	11	14	33
3	30	8	27	44	17	13	30
4	19	14	27	45	23	10	32
5	22	29	12	46	16	8	36
6	15	23	26	47	24	11	31
7	13	33	22	48	25	10	27
8	16	12	37	49	22	11	29
9	13	29	27	50	27	10	26
10	30	8	28	51	27	9	27
11	9	20	29	52	7	41	6
12	23	25	26	53	12	43	4
13	8	14	26	54	11	44	4
14	24	17	25	55	8	42	6
15	17	22	29	56	8	49	5
16	14	10	21	57	6	49	4
17	13	7	13	58	6	42	4
18	9	30	24	59	6	45	10
19	9	30	21	60	11	42	9
20	6	21	25	61	15	26	26
21	11	26	26	62	11	27	28
22	15	18	19	63	14	27	27
23	3	47	8	64	16	24	25
24	3	46	14	65	20	28	29
25	1	44	16	66	16	22	31
26	1	41	18	67	17	20	30
27	3	33	21	68	11	37	21
28	0	21	29	69	8	34	20
29	2	38	22	70	13	28	25
30	1	34	27	71	12	28	22
31	3	39	14	72	13	28	26
32	5	45	16	73	6	30	21
33	8	35	21	74	8	30	23
34	18	22	24	75	19	24	19
35	15	22	26	76	13	31	24
36	10	31	26	77	18	20	23
37	17	31	19	78	23	20	21
38	16	30	23	79	11	13	20
39	14	13	35	80	14	15	21
40	16	12	34	81	11	16	27
41	16	12	34	82	7	21	20

TABLE III

SOURCE OF TRAINING IN PER CENT IN TEN GROUPS OF FARM MECHANICS JOBS

GROUP	PER CENT BEFORE COLLEGE	PER CENT IN COLLEGE	PER CENT WHILE TEACHING
Carpentry	33.7	29.6	36.6
Motors	24.0	35.3	40.7
Welding	4.0	65.2	30.8
Concrete Work	21.3	43.4	35.3
Rope Work	26.3	19.0	54.7
Glazing	40.0	16.1	43.9
Forge Work	14.3	75.8	9.9
Soldering	22.7	36.5	40.8
Electricity	17.4	48.2	34.4
Operating Power Equipment	25.0	35.0	40.0
All Groups	22.3	41.2	36.5

evident that a great majority of the instructors received a good share of their training in this manner. Highest percentage groups are carpentry (33.7 per cent) and glazing (40.0 per cent). Most noticeable low percentage groups are welding (4 per cent), forge work (14.3 per cent) and electricity (17.4 per cent). The total amount of training obtained before college is 22.3 per cent.

"In College" training is low for ropework (19.0 per cent) and glazing (16.1 per cent). A large number of instructors received a high percentage of training in this category. Highest are forge work (75.8 per cent), welding (65.2 per cent), and electricity (48.2 per cent). The more technical jobs seem to have a higher percentage than do the common, easier jobs to perform.

The over-all training received "In College" is 41.2 per cent. This is almost twice the amount for "Before College" which is 22.3 per cent and more than "While Teaching" which is 36.5 per cent.

Forge work was the only group in which a low percentage figure is found obtaining training "While Teaching". This may be due to the fact that many schools do not have forges available, and also that it is a required course in the agricultural education curriculum. Many teachers received a comparatively high percentage of their training while teaching. The over-all percentage is 36.5 per cent. Nine of the ten groups run from 30 per cent to over 50 per cent with rope work

being the highest (54.7 per cent).

The column "Should This be Taught in College Courses to Agricultural Education Majors?" was also tested for significance with the Chi-square test and is given in Table IV. This area having two possible answers has one degree of freedom (degree of freedom = n - 1). Converting the Chi-square number with one degree of freedom at the five per cent level of probability gives 3.841. In other words, any item in Table IV with a Chi-square of 3.841 or larger is significant at the five per cent level of probability.

On this basis by far the great majority of these jobs (79 out of 82) should be taught in college course.

Those that are not significant at the 5 per cent level are item 46 (making a rope halter), item 47 (cutting glass), and item 51 (applying putty).

TABLE IV

VALUE OF CHI-SQUARE AND LEVEL OF PROBABILITY

FOR ITEMS UNDER "SHOULD BE TAUGHT IN COLLEGE"

ITEM NO.	CHI-SQUARE	PROBABILITY	ITEM NO.	CHI-SQUARE	PROBABILITY
1	43.3	.01	42	6.6	.02
2	35.3	.01	43	11.2	.01
3	26.6	.01	44	8.0	.01
4	26.6	.01	45	4.2	.05
5	19.3	.01	46	.03	.90
6	56.1	.01	47	2.9	.30
7	58.0	.01	48	6.0	.05
8	32.2	.01	49	6.7	.01
9	56.2	.01	50	4.3	.05
10	7.3	.01	51	2.9	.10
11	45.1	.01	52	12.1	.01
12	58.0	.01	53	18.1	.01
13	50.5	.01	54	19.3	.01
14	56.1	.01	55	30.8	.01
15	56.1	.01	56	36.8	.01
16	20.4	.01	57	40.0	.01
17	11.2	.01	58	16.0	.01
18	52.2	.01	59	50.4	.01
19	30.0	.01	60	36.8	.01
20	52.2	.01	61	50.4	.01
21	30.0	.01	62	41.6	.01
22	26.6	.01	63	32.2	.01
23	48.6	.01	64	36.8	.01
24	30.0	.01	65	41.6	.01
25	52.2	.01	66	36.8	.01
26	30.0	.01	67	36.8	.01
27	58.0	.01	68	30.0	.01
28	56.2	.01	69	43.4	.01
29	30.0	.01	70	56.2	.01
30	30.0	.01	71	56.2	.01
31	46.8	.01	72	54.1	.01
32	30.0	.01	73	58.0	.01
33	52.5	.01	74	58.0	.01
34	41.6	.01	75	22.8	.01
35	48.6	.01	76	30.0	.01
36	45.0	.01	77	50.4	.01
37	33.7	.01	78	43.4	.01
38	36.8	.01	79	32.2	.01
39	7.3	.01	80	33.7	.01
40	6.0	.02	81	41.6	.01
41	6.0	.02	82	45.0	.01

SUMMARY AND CONCLUSION

The primary purpose of this study was to determine the importance of pre-service training in farm mechanics jobs for vocational agriculture majors.

The group surveyed was the present teachers of vocational agriculture in South Dakota with one or more years of experience. To each of the teachers in this group was sent a survey sheet listing 82 jobs in the farm mechanics field. These jobs were checked for importance, where the ability to do the job was acquired, and also checked as to whether or not each individual thought it should be included in college courses for agricultural education majors.

After tabulating this list the Chi-square test of significance was applied to each item under "Importance" and "Should This be Taught in College Courses to Ag Ed Majors?". Thie Chi-square number was then converted to a level of probability percentage figure.

Under the column "Ability Acquired" the jobs were grouped into 10 different groups and the per cent of training from each of three areas figured. There was also a total per cent figure for each area.

The following factors would, to some extent, limit the conclusions of this study:

1. The mechanical ability and the interests of the instructors may vary greatly, and would be expected

to influence the emphasis placed on each job.

2. The instructors who have not acquired the ability to do a job, would, under "Importance", no doubt check the "Never Taught" column.
3. Some of the instructors did not check every item and some checked two or even three sources of training under "Ability Acquired".

In view of the limitations mentioned the following conclusions are drawn from this study:

1. Under "Importance", of the 82 jobs listed 18 were at the 5 per cent or greater level of probability as shown in Table I. Falling into this category were items 11, 13, 16, 20, 31, 52, 53, 54, 55, 56, 57, 59, 60, 73, 75, 79, 80 and 82. These items are not significant. There were two items which were significant at the 1 per cent level of confidence with a majority of the instructors checking the "Never Taught" column. They were item 17 (valve grinding) and item 58 (forge welding). From these results it would seem they need not be included in the pre-service training.
2. Under the area "Ability Acquired" no definite conclusions can be drawn from Table II. There are trends, but to draw conclusions is difficult. By converting the figures to percentages and grouping the jobs as was done in Table III definite conclusions

can be drawn. The training acquired before college averages 22.9 per cent for the ten groups. The highest group was carpentry (33.7 per cent), while the lowest was for the much more specialized skill of welding (4 per cent). The training received in college was the greatest for the specialized jobs of welding (65.2 per cent) and forge work (75.8 per cent). Lowest was glazing and puttying (16.1 per cent) and rope work (19.0 per cent). For other than welding and forge work it would seem the college training in these areas could be increased. The abilities acquired while teaching seem high on the average (36.7 per cent). The logical conclusion is that agriculture teachers are going out to teach without adequate preparation in the farm mechanics field. Forge work (9.9 per cent) was the only low figure for this source of training, the other groups all being over 30 per cent. The conclusion would be that the training from this source is greater than it should be.

3. Under the column "Should This Job be Taught in College Courses to Ag Ed Majors?" the majority of the jobs were at the 1 per cent level of probability. Those items at more than the 5 per cent level of probability are 46, 46 and 51. It is doubtful that these items should be included in college courses.

RECOMMENDATIONS

On the basis of this study the writer makes the following recommendations:

1. All of the jobs as listed in the survey sheet in Appendix B, except items 11, 13, 52, 54, 55, 56, 57, 59, 60, 73 and 79, are important enough to be included in farm mechanics classes.
2. If these jobs are important enough to be taught in high school, it is important to have college training in each job. Therefore, to increase the per cent of college training and result in a more efficient teacher of farm mechanics, all of the jobs as listed in the survey sheet, Appendix B, except those noted in Number 1 above, should be taught in college courses to agricultural education majors.

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APPENDICES

APPENDIX A

Volga, South Dakota
March 20, 1956

Dear Ag Teacher:

Being a teacher of vocational agriculture I am sure you are aware of the importance of the farm mechanics program. With each passing year farms become more and more mechanized. What to teach, how to teach it, and teaching procedures are problems we all face in this phase of education.

To complete work for my Master's Degree it is necessary that I prepare a research paper on some phase of vocational agriculture. The topic I have chosen is "A Study to Determine the Importance of Pre-Service Training in Farm Mechanics Jobs in Vocational Agriculture". The purpose is to determine, from the standpoint of teaching them, how important various jobs are in farm mechanics, and to ascertain in what manner the ability to do and teach these jobs was acquired.

I would appreciate it very much if you would complete the enclosed check sheet and return it to me at your earliest convenience. I think you will find that it takes a very short time to fill this out, and of course the value of a study such as this depends a great deal on the completeness of the returns from the teachers of vocational agriculture all over the state. A stamped, self-addressed envelope is enclosed.

Sincerely,

Morris W. Magnuson

APPENDIX B

SURVEY SHEET

Your Name_____ School_____

Number of years of teaching vocational agriculture (Include 55-56 school year) _____

Directions.

Listed below are major jobs taught in the farm mechanics field of vocational agriculture. To the right of this list are three categories: 1) Importance, 2) Ability acquired, and 3) Should this job be taught in college courses to Ag Ed Majors?

Under IMPORTANCE are three columns, always taught, taught at times, and never taught. Put a check mark (x or ✓) in the column which most accurately describes the place of this job in your program.

ABILITY ACQUIRED refers to your own ability to do and teach these jobs. The most appropriate column should be marked under this category. If you have not acquired the ability to do any of these jobs leave blank.

Under the last heading put a check in the YES column if you think this job should be taught in a college course and a NO if you think it should not.

LIST OF JOBS	IMPORTANCE			ABILITY ACQUIRED			SHOULD THIS BE TAUGHT IN COLLEGE COURSES TO AG ED MAJORS?	
	Always taught	Taught at times	Never taught	Before college	In college	While teaching	YES	NO
1. Correct use of carpentry tools.								
2. Figuring bills of material.								

LIST OF JOBS	IMPORTANCE			ABILITY ACQUIRED			SHOULD THIS BE TAUGHT IN COLLEGE COURSES TO AG ED MAJORS?	
	Always taught	Taught at times	Never taught	Before college	In college	While teaching	Yes	NO
3. Figuring the cost of materials.								
4. Identifying kinds of wood.								
5. Making different kinds of wood joints.								
6. Cutting rafters.								
7. Knowing the fundamentals of building construction.								
8. Recognizing the grades of lumber.								
9. Knowing various building terms.								
10. Knowing nail sizes.								
11. Using tables on the carpenter's square.								
12. Understanding the gas motor.								
13. Understanding the diesel motor.								
14. Understanding cooling systems.								
15. Understanding lubricating systems.								
16. Bearing adjustment.								
17. Valve grinding.								
18. Knowing the types of gas motors.								
19. Knowing carburetion systems and how they work.								

LIST OF JOBS	IMPORTANCE			ABILITY ACQUIRED			SHOULD THIS BE TAUGHT IN COLLEGE COURSES TO AG ED MAJORS?	
	Always taught	Taught at times	Never taught	Before college	In college	While teaching	YES	NO
20. Understanding fuels and their properties.								
21. A knowledge of ignition systems								
22. The proper use of automotive tools.								
23. Acetylene welding procedures.								
24. Arc welding procedures.								
25. Recognizing types of welds.								
26. Choosing the correct rod.								
27. Metal identification.								
28. Hard surfacing.								
29. Brazing.								
30. Cutting with the arc welder.								
31. Cutting with the acetylene welder.								
32. Ability to make simple welds.								
33. Selecting aggregate for concrete work.								
34. Constructing forms.								
35. Laying out foundations.								
36. Figuring amounts of materials.								

LIST OF JOBS	IMPORTANCE			ABILITY ACQUIRED			SHOULD THIS BE TAUGHT IN COLLEGE COURSES TO AG ED MAJORS?	
	Always taught	Taught at times	Never taught	Before college	In college	While teaching	YES	NO
37. Measuring and mixing materials.								
38. Finishing and curing concrete.								
39. Making an eye splice.								
40. Making an end splice.								
41. Making a long splice.								
42. Making a short splice.								
43. Selection of rope.								
44. Care of rope.								
45. Tying common knots.								
46. Making a rope halter.								
47. Cutting glass.								
48. Preparing the frame.								
49. Using glazing equipment.								
50. Putting in glazier points.								
51. Applying putty.								
52. Knowing the parts of the forge.								

LIST OF JOBS	IMPORTANCE			ABILITY ACQUIRED			SHOULD THIS BE TAUGHT IN COLLEGE COURSES TO AG ED MAJORS?	
	Always taught	Taught at times	Never taught	Before college	In college	While teaching	YES	NO
53. Building a forge fire.								
54. Maintaining a forge fire.								
55. Proper use of the tongs.								
56. Tempering.								
57. Drawing, upsetting and twisting.								
58. Forge welding.								
59. Knowing types of metals.								
60. Using flux.								
61. Knowing metals that can be soldered.								
62. Different types of irons.								
63. Cleaning metals.								
64. Tinning and sweating.								
65. Safety precautions.								
66. Knowing types of solder.								
67. Use of soldering flux.								

LIST OF JOBS	IMPORTANCE			ABILITY ACQUIRED			SHOULD THIS BE TAUGHT IN COLLEGE COURSES TO AG ED MAJORS?	
	Always taught	Taught at times	Never taught	Before college	In college	While teaching	YES	NO
68. Knowing electrical terms.								
69. Knowing electrical symbols.								
70. Proper use of fuses.								
71. Insulating electric wires.								
72. Splicing wires.								
73. Figuring wire sizes and loading.								
74. Knowing conductors.								
75. Reading meters.								
76. Operating power saws.								
77. Operating a drill press.								
78. Operating a grinder.								
79. Operating a turning lathe.								
80. Operating jig saws.								
81. Operating power sanders.								
82. Operating a jointer.								