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A Comparison of Vocational Agricultural Facilities in Utah High Schools and Those in Selected States of the Western Region as Perceived by Vocational Agriculture Teachers

Ray J. Tubbs
Utah State University

A COMPARISON OF VOCATIONAL AGRICULTURAL FACILITIES IN UTAH HIGH SCHOOLS AND THOSE IN SELECTED STATES OF THE WESTERN REGION AS PERCEIVED BY VOCATIONAL AGRICULTURE TEACHERS

by

Ray J. Tubbs

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Ray J. Tubbs

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ABSTRACT

A Comparison of Vocational Agricultural Facilities in Utah High Schools And Those in Selected States of the Western Region as Perceived By Vocational Agriculture Teachers

by

Ray J. Tubbs, Master of Science

Utah State University, 1979

Major Professor: Dr. Pat Pruitt
Department: Agricultural Education

This study was limited to vocational agricultural teachers in Utah and ten agricultural teachers randomly selected from each of the following states: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico and Wyoming.

Questionnaires were completed and returned by a total of 54 Utah vocational agricultural teachers and 50 teachers from the other states. The questionnaires were designed to collect data concerning class size, requirements of the physical facilities and the budget allowed for teaching agricultural mechanics.

The study revealed a larger number of non-vocational agriculture students are enrolled in the agricultural programs in Utah than in the other states. The data indicated there are more total students enrolled in Utah vocational agricultural programs than in the other states per teacher. The facilities available in Utah were generally smaller and less equipped for teaching basic agricultural mechanics

as compared to other states. Many of the teachers in both groups perceived their facilities inadequate and all recommended improvements. The study also indicated that Utah teachers were receiving a lower budget based on student hours than were the teachers from other states. Many teachers surveyed did not know the amount of their capital or operating budgets for their vocational agricultural programs.

(85 pages)

CHAPTER I

INTRODUCTION

Classroom and shop facilities will provide an environment conducive to learning which will determine the level of skill development in the secondary schools. These facilities are needed across the nation that will meet the physical needs of students and thus provide an opportunity for learning to those who might otherwise never develop the skills so necessary for meaningful employment and personal achievement.

Learning takes place only after specific needs of the student have been satisfied. These needs can be categorized into two broad areas comprised of emotional needs and physical needs.

Emotional needs are as diversified as the students are different. Psychologists tell us that emotional stress must be reduced before a student is willing to learn as stressed in The Professional Education of Teachers (Coombs, 1967).

The student who is concerned about his physical well being and safety is not likely to worry about his peer acceptance and even less likely to worry about the learning experience. It is generally accepted by educators that until the physical needs are met, there is very little learning that can take place. These physical needs include such things as freedom from personal danger, personal comfort, and the opportunity for skill development. Generally, the physical needs are even more important than the emotional needs. Uniquely, all of these needs can be met by the facilities available to the student.

Background of the Study

Agriculture teachers in Utah's secondary schools have long indicated a need for acceptable physical standards for vocational classrooms and shops. There is a need for more than vague generalizations. Guidelines that are practical and useful was a need indicated by educators in the Western Region as contained in the Journal of the American Vocational Association (Crawford & Oades, 1979). The Western Region comprised the states of Arizona, Colorado, Idaho, Montana, Nevada, New Mexico and Wyoming. These guidelines are essential in developing quality facilities for teaching vocational agriculture.

Attempts at national standards have failed to satisfy educators across the United States because of varying program thrusts, differences in equipment, and state regulations. These attempts have ended in lack of concensus in many areas. An example of these conflicting proposals is the requirement of "space per student" in the classroom and in the shop.

The purpose of this study was to compare the agricultural facilities found in the high schools in Utah with those in other states selected from the Western Region. More specifically it was to:

1. Compare agricultural facility needs of high schools in the Western Region to those within the state of Utah.

2. Determine if the agricultural shop facilities being used in Utah and in various other states are perceived by teachers to facilitate and encourage learning.

3. Determine which students are using the present facilities.

4. Determine to what extent the facilities are being used by non-high school students.

5. Determine the physical dimensions, major equipment capabilities, and major program thrusts in vocational agricultural shops.

6. Determine the present ratio of funding provided for by the number of students being taught based on student hours.

Research Design

The information used as a basis for compiling data came primarily from the intermountain states in the Western Region, namely: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, and Wyoming. Due to similar interests and needs, it was felt that representative coverage could be obtained by limiting the research to these states.

The state of Utah and other Western Region states were comparable in their needs and locality but only the development of standards for the state of Utah was intended. This is due to the differences in regulations and educational thrusts found in each of the states.

From each of these states, a list of the high schools was obtained. From each of these states, ten schools were randomly selected to ensure a representative sample and to eliminate biased selections.

The information was obtained with a questionnaire that was sent to the agriculture teachers in the high schools. Accompanying the questionnaire was a cover-letter explaining the questionnaire.

A follow-up letter to non-respondents was sent two weeks after the initial questionnaire was mailed. The follow-up letter contained the same information that was sent previously, as well as a request for cooperation in returning the completed questionnaire. With this type of follow-up system, a return rate of 75% was considered a minimum goal.

After the questionnaires were returned, the data was analysed and

put into tabular form. The number of respondents and thier responses are shown in the tables of this study.

The questionnaire was able to gather the information without being subjected to personal bias towards any one program or state. By randomly distributing the questionnaire, a broad survey was possible without incurring prohibitive costs.

A limitation of this study was cooperation in filling out the questionnaire. Also there was a limitation in gaining full coverage in the immediate surrounding states which could have been comparable to Utah's needs.

CHAPTER II

REVIEW OF LITERATURE

An environment which is conducive to the vocational and training process can be influenced by the quality of the facilities which accomodate the educational programs in vocational and technical education. The overall learning of students in the secondary schools is dependent upon this environment (Juby, 1977).

In the development of standards for Oregon by Oades and Deeds (1978) the basic standards were created and validated in a nationwide effort involving vocational agriculture instructors, school administrators, state vocational agriculture supervisors, and agriculture teacher educators. Oregon State University and the State Department of Education worked together to refine the standards and to assess the criteria for Oregon.

After being reviewed, revised, and validated by instructors, administrators and regional coordinators, standards were offered which contributed to the quality of vocational agricultural program. A scale ranging from poor to excellent with poor being one and excellent being five was used. This scale system permitted an inventory of the current programs and helped to formulate new recommendations based upon the input of educators and administrators.

As was pointed out in the Journal of the American Vocational Association (Author, 1979), without standards, there is the problem of programs being divided into too many directions. This tendency to "wander" has become obvious to agricultural teachers across the nation.

In Recommendations for a Vocational Agriculture Classroom and Agriculture Mechanics Shop (1972) issued through Denver, Colorado, many recommendations were listed. Much emphasis was placed on using the facilities strictly for vocational agricultural programs and not for outside programs. Suggestions for more convenient and essential facilities were given. These suggestions were based upon what was considered the most efficient and beneficial conditions for promoting learning in the secondary agricultural facilities.

All facilities, supplies, equipment, and tools should be used only for classes taught by the teacher of vocational agriculture. Any use of these items should be through the teacher's approval.

Arizona educators realized that to have a successful and quality program, it was essential that standards be recognized as a vital segment of the program. Not only must these standards be identified, but they must also be maintained to be of value to educators or administrators, as shown in Arizona Department of Education (1978).

To see if the standards established by administration, educators and advisory council members were being followed, specific areas were identified. After the major area was identified, it was broken down into specific objectives. Each objective was measured for implementation of the standards in the school by having it identified as "exceeds standards", "meets standards" or "does not meet standards". This information would indicate whether the standards were realistic or if they corresponded with the major thrusts of the vocational programs in Arizona. The standards suggested by Arizona were comparable to standards recommended in Colorado (1972) and Oregon (Oades & Deeds, 1978).

The approach to standards by Idaho as contained in Idaho Standards for Quality Secondary Vocational Agriculture/Agribusiness Programs was similar to Arizona's.

Several objectives were listed and then measured as "exceeds standards", "meets standards", or "does not meet standards". In addition to this ranking, several choices in facility size, equipment and facility arrangements were available. The choices on each question were assigned points ranging from one (worse) to four (best). The points were totaled and written as an evaluation score. From these evaluation scores, facilities could be identified as achieving either the standards sought, or of failing to achieve the desired standards.

Physical facility standards such as those developed in the Operations and Procedures Manual in Oklahoma (1974-75) have been separated into seven major categories. These seven categories, which will be summarized individually, include (1) classrooms, (2) shop, (3) laboratory, (4) equipment, (5) reference materials, (6) additional facilities, and (7) cost.

1. Classrooms. Classrooms whould provide adequate floor space per student. Chalkboards, teaching materials, and media equipment should be located in the classroom. Provisions for darkening the room to facilitate the showing of slides and pictures should be made.

2. Shop. The shop should be used exclusively for the teaching of vocational agriculture students. The shop should be an intricate part of the same structure in which the classroom is located. The overhead door, ceiling and size should be adequate for handling farm equipment safely. The wiring should be adequate for operation of heavy equipment without overloading. Washroom and restroom facilities

should be suitable for the size of the largest class.

3. Laboratory. The laboratory should be adjacent to the classroom. A sink, water, gas, and electricity should be provided.

4. Equipment. Enough special equipment such as slide and filmstrip projectors and other visual-aid equipment should be available to meet the needs of the department. The lab equipment should meet the needs of the community and the farm mechanics equipment should be sufficient for teaching major areas of farm mechanics. Adequate storage facilities must be available to house and protect the equipment from weather and vandalism.

5. Reference materials. At least one copy for each student in the largest class for each major enterprise in the community should be available. Subscriptions to appropriate farm publications are necessary for updating and supplementing classroom materials.

6. Other facilities. Other facilities such as school farms, school pick-ups, and community service equipment contribute to the effectiveness of vocational agriculture.

7. Cost. Cost of equipment varies from year to year. A minimum of $500 should be budgeted each year for replacements and additional equipment was suggested by the Oklahoma publication.

Some standards printed by the Texas Education Agency in Facility Standards and Equipment for Agricultural Education Programs (Oct. 1974) were of special interest due to the increase of multi-departments. The standards from Texas compare one-man departments to multi-departments by suggesting space requirements for one, two, or three teacher units.

This publication also went into much detail concerning facility planning and space utilization. When new high school buildings are planned, the vocational agriculture facility is often planned as a wing to the building. Some additional considerations were stressed if a separate building was planned.

According to this source, several considerations are essential for planning facilities. The vocational agricultural building should be located conveniently near the main school building for the benefit of the students attending classes in the building. The building should be landscaped so as to be attractive and inviting to the students. Space should be available for project construction, expansion, or machinery assembly.

The facility should be easily accessable with a hallway separating the classrooms, shop areas, and office. The building should be in harmony with the main school building. It should be close to the electrical, water, and seqage services to reduce the cost of construction and maintenance. The teacher should have the office located so as to look into the classroom or shop to provide better supervision and control of the students.

Space should be provided to eliminate congestion around dangerous equipment and to provide an area for the construction of projects.

According to a publication by Utah, the Utah State Board for Vocational Education has the authority to make policies and set standards as shown in Vocational Education Program Standards for Quality (1977).

> The State Board for Vocational Education shall have all necessary authority to cooperate with the United States Office

> of Education in the administration of the said Act of Congress, to administer any legislation enacted pursuant thereto by the State of Utah and for the promotion, aid, and maintenance of Vocational Education . . . (Utah Code Annotated, 1953-53-16-5).

These policies must not only be made but they must be practical and beneficial to those being directly affected. This can be accomplished by utilizing the skills and acquired knowledge of the teachers and specialists of vocational agriculture. For example, an agricultural mechanics specialist from Stillwater Oklahoma wrote, "When a school begins to think about a new vo-ag facility, time spent planning can sure pay off later in a more useful building" (Hart, 1978).

In this article, Hart (1978) separated the planning of facilities into three major steps:

Step 1. The size of the facility must be planned. This would include the classroom, the shop, and the office. In addition, these plans must consider such things as restrooms, tool rooms, the laboratory storage space, and student locker areas. If space was not provided in any of these areas, the facilities could not be as efficient and convenient as they might otherwise be.

Step 2. The basic floor plan must be considered. By visiting other facilities and viewing blueprints, ideas could be formulated that would help in laying out a floor plan that would utilized the space and provide safe working conditions for the students.

Step 3. The type of structure must be determined. In this stage of planning, the materials to be used as well as the money available must be considered. The structure should provide an attractive atmosphere that will not inhibit the learning of the students. It

is important that the facility be such that the instructor has complete supervision and control of the activities of the students at all times.

In summary, facilities that satisfy the needs of the students as well as the instructors are desired. The references cited agree that adequate space, safety, supervision, and design are of primary importance in the building or remodeling of the facility. There are differences in the actual dimensions recommended, but these are due to the programs being taught and personal desires. A facility that has room for skill development and a learning environment is the desire of educators across the nation.

CHAPTER III

THE METHODOLOGY

The purpose of this study was to compare the agricultural facilities found in the high schools in Utah with those in other states of the Western Region. More specifically it was to:

1. Compare agricultural facility needs of high schools in the Western Region to those within the state of Utah.
2. Determine if the agricultural shop facilities being used in Utah and various states facilitate and encourage learning.
3. Determine which students are using the present facilities.
4. Determine what extent the facilities are being used by non-high school students.
5. Determine the physical dimensions, major equipment capabilities, and major program thrusts in vocational agricultural shops.
6. Determine the present ratio of funding provided for by the number of students being taught based on student hours.

Approach

The approach to this research was through a survey conducted in Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, and Wyoming by means of a questionnaire.

The results from these surveys were compared to results obtained from Utah's high school vocational agricultural departments using the same questionnaire.

Description of Subjects

Ten high school vocational agricultural teachers were selected from each of the following states: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, and Wyoming. The department heads of each of the state universities mentioned were also sent a letter requesting information concerning published standards for facilities. Responses were used as a review of literature in this study.

Description of the Instrument

A cover letter and questionnaire was mailed from the Agricultural Education Department of Utah State University to each vocational agricultural teacher in Utah and to the vocational agricultural teachers in the seven selected states in the Western Region. The cover letter explained the purpose of the questionnaire and specified a date the questionnaire should be mailed back in order to be tabulated.

The questionnaire was used to collect information about facilities where the agricultural teachers were presently employed. Provisions were made on the questionnaire to obtain suggestions or recommendations the teachers might have about facility needs.

A one-page letter was also sent to department heads asking that any state standards proposed or accepted by their state be mailed to Utah State University to serve as a guide for the proposal of new standards for Utah high school vocational agricultural facilities.

Description of the Procedures

The information used as a basis for compiling these data came primarily from the seven Western Region states previously mentioned. Due to regional similar interests and needs, it was felt that

representative coverage could be obtained by limiting the research to said states.

From the National Directory of Agricultural Teachers (1978), ten names were randomly selected to represent each of the seven states. Two additional names were also selected in case of a recent change not listed in the directory.

A cover letter and a questionnaire was sent to each of the selected agricultural teachers. The cover letter accompanying the questionnaire explained the purpose of the study and asked for cooperation in returning the completed questionnaire. A date was also given specifying the time when all of the materials should be returned.

A letter was also addressed and sent to the department heads of the Department of Agricultural Education in the universities of the seven states being sampled. Their names were taken from a list containing all the University Department Heads in the United States.

Each envelope mailed to the high school agricultural teacher and department head also contained a stamped, self-addressed envelope for the convenience of those who were being sampled.

A follow-up letter to non-respondents outside of Utah was sent two weeks after the initial questionnaire was sent. The follow-up letter contained the same information that was sent previously, as well as another request for cooperation in returning the completed questionnaire.

The follow-up letters to non-respondents within the state of Utah were distributed at a seminar being attended by the vocational agricultural teachers. This eliminated the cost of handling and provided a chance for personal contact. The follow-up letters

contained the same information in returning the questionnaire.

With this type of follow-up system, an expected return rate of 75% was considered a minimum goal.

Analysis

After all the questionnaires were returned, the data was separated into two categories. One category consisted of the information collected from the teachers surveyed in the state of Utah and the other category consisted of the data collected from the teachers in the seven states selected from the Western Region. The data were separated and put into tabular form for convenience and clarification to the reader. Data comparisions can be made of Utah facilities and facilities of other states surveyed. The data indicate the usage and efficiency of the facilities involved in the study.

CHAPTER IV

ANALYSIS OF DATA

Agricultural teachers in Utah's secondary schools have long indicated a need for acceptable physical standards for vocational agricultural classrooms and shops. Established guidelines are needed that are practical and useful to improve the quality of existing programs and facilities and to insure the efficiency and usefulness of planned facilities.

Without adequate facilities and effective training programs, the education and skills development of students will be impaired.

The purpose of this study was to compare the agricultural facilities from the high schools in Utah with those in other states selected from the Western Region. More specifically it was to:

1. Compare agricultural facility needs of high schools in the Western Region to those within the state of Utah.

2. Determine if the agricultural shop facilities being used in Utah and various other states are perceived by agricultural teachers to facilitate and encourage learning.

3. Determine which students are using the present facilities.

4. Determine to what extent the facilities are being used by non-high school students.

5. Determine the physical dimensions, major equipment capabilities, and major program thrusts in vocational agricultural shops.

6. Determine the present ratio of funding provided for by the number of students being taught based on student hours.

This chapter is a summarization and analysis of date collected. Although a total of 98 responses were received, not every question was answered. Percentages, therefore, are based on the actual number responding to the individual questions, hereafter shown as "N".

With the number of respondents compared to the number surveyed shown in Table 1, the rate of return from each of the states can be seen.

Table 1

Number and Percent of Returned Questionnaires from Teachers in Utah and Selected States in the Western Region

States	Teachers Surveyed	Teachers Responses	Percent Return
Utah	68	54	79.4
Arizona	10	7	70.0
Colorado	10	7	70.0
Idaho	10	9	70.0
Montana	10	6	60.0
Nevada	10	7	70.0
New Mexico	10	7	70.0
Wyoming	10	7	70.0
N =	138	104	75.5

Of the 54 vocational agricultural teachers responding in Utah, 44 or 81.5% showed they had an agricultural mechanics program as shown in Table 2, with ten teachers indicating they had no

existing program. By comparison, of the 50 teachers responding in the selected states in the Western Region, 41 or 82.0% had an agricultural mechanics program.

In comparing total school sizes, the number of students in the schools of Utah ranged from 90 students to 2,500 students with an average of 855.

Table 2

Summary of Schools Offering an Agricultural Mechanics Program

Availability of Program	Utah		Other States	
	Number	Percent	Number	Percent
Program	44	81.5	41	82.0
No Program	10	18.5	9	18.0
N =	54		50	

In comparision, the number of students in the schools of the other states ranged from 40 students to 4,000 students with an average of 704. From these data, it is evident that the average student enrollment in high schools in Utah tends to be higher than the other states surveyed.

As indicated in Table 3, 29.3% of the agricultural teachers in Utah have taught vocational agriculture less than 3 years. It was interesting to note 38.1% have taught vocational agriculture at their present school for the same length of time. In the surrounding states, 40.8% have taught for the same period of time with 26.5% having taught at the present schools for the duration. This data indicates that Utah teachers are less mobile in present teaching.

Table 3

Distribution of Teachers' Responses for Years Teaching at Present School as Compared to the Total Number of Years Teaching Vocational Agriculture

Years Teaching Vocational Agriculture	Years at Present High School				Total Years Teaching			
	Utah		Other States		Utah		Other States	
	Number of Teachers	Percent	Number of Teachers	Percent	Number of Teachers	Percent	Number of Teachers	Percent
3 or less	12	29.3	20	40.8	12	28.1	13	26.5
4 - 10	9	21.9	16	32.7	10	23.1	20	40.8
11 - 15	5	12.2	5	10.2	4	9.3	6	12.3
16 - 20	7	17.0	3	6.1	10	23.1	5	10.2
21 - 25	4	9.8	3	6.1	2	4.8	3	6.1
26 - 30	2	4.9	0	0.0	1	2.3	0	0.0
more than 30	2	4.9	2	4.1	4	9.3	2	4.1
N =	41		49		43		49	

Data in Table 4 indicates 31% of the agricultural mechanics programs in Utah had less than 20 students enrolled while 12.8% of the out-of-state schools had less than 20 students in their program. The average number of students in each vocational agricultural program in Utah was 42, while the average number in the other states was 37.

Table 4

Distribution of Teacher Responses Indicating the Number of Students Enrolled in Vocational Agricultural Mechanics

	Utah		Other States	
Students	Number	Percent	Number	Percent
Less than 20	13	31.0	6	12.8
20 - 30	8	19.0	13	27.7
31 - 40	4	9.5	9	19.1
41 - 50	4	9.5	6	12.8
51 - 60	1	4.8	6	12.8
61 - 70	1	2.4	4	8.5
71 - 80	1	4.8	1	2.1
more than 80	8	19.0	2	4.2
N =	41		47	
Average		42.0		37.0

From the teachers' responses in Table 5 comparing vocational to non-vocational student usage of facilities, 51.2 % of the facilities in Utah were used by less than 20 non-vocational students each day. In the other states, 67.4% of the facilities were used

by less than 20 non-vocational students. At every level, a higher percentage of non-vocational students in Utah were using the facilities intended for vocational training than those in the other states.

Table 5

Number and Percent of Students Using Vocational Agricultural Facilities Each Day

	Vocational Agriculture				Non-Vocational Agriculture			
	Utah				Other			
Students	Number/Percent		Other/Percent		Number/Percent		Other/Percent	
Less than 20	9	19.1	5	10.2	24	51.1	33	67.4
20 - 39	12	25.5	22	44.9	9	19.1	9	18.4
40 - 59	10	21.3	15	3.6	7	14.8	5	10.2
60 - 79	4	8.5	5	10.2	2	4.3	0	0.0
80 - 99	6	12.8	0	0.0	2	4.3	1	2.0
100 or more	6	12.8	2	4.1	3	6.4	1	2.0
N =	47		49		47		49	

As shown in table 6, nearly 21% of Utah schools have facilities that are being used by 7th and 8th graders. It can be noticed that 20.4% of the surrounding states offer vocational agricultural mechanics for these same gardes. A trend exists in both groups with higher percentages occuring in grades 10, 11, and 12.

Table 6

Distribution of Teachers Responses Indicating Grade Levels for Instruction of Agricultural Mechanics

	Utah		Other States	
Grade Level	Number	Percent	Number	Percent
7th and 8th graders	11	20.8	10	20.4
9th grade	24	45.3	29	59.2
10th grade	52	98.1	38	77.6
11th grade	52	98.1	48	98.0
12th grade	52	98.1	47	96.0
N =	53		49	

As indicated in Table 7, 39.5% of the teachers in Utah indicated that the average number of students that could be effectively taught in the classroom was less than 20 students. A total of 84.9% of the teachers indicated that 20 or less was the maximum number they could teach effectively in the shop. This same trend is similar for the other states with 40.0% of the teachers indicating the range of 16 - 20 as the number of students that they could effectively teach in the classroom. Forty-nine percent of the teachers indicated less than 15 students could be taught effectively in the shop.

As shown in Table 8, 61.1% of the facilities are being used for teaching adults and other students in Utah while approximately half of the schools in the other states are using their facilities for other classes.

Table 7

Perceived Number of Students that can be Taught Effectively in the Classroom and Shop as Indicated by the Vocational Agriculture Teachers

Students	Utah				Other States			
	Classroom	Percent	Shop	Percent	Classroom	Percent	Shop	Percent
Less than 10.....	0	0	0	0		8.0	7	14.3
11 - 15.....	3	7.9	13	39.4	6	12.0	24	49.0
16 - 20.....	12	31.6	15	45.5	20	40.0	15	30.6
21 - 25.....	13	34.2	3	9.1	14	28.0	3	6.1
26 - 30.....	10	26.3	1	3.0	6	12.0	0	0.0
More than 30.....	0	0.0	1	3.0	0	0.0	0	0.0
N = ...	38		33		50		49	

As indicated in Table 9, it was found that in Utah, 35.2% of the facilities were used for Young and Adult Farmer Programs, 27.8% were used for non-agricultural programs, and 88.9% were used for preparing materials for the coming school year. Comparatively, 28.0% of the surrounding states' facilities were used for Young Farmers and Adult Farmer programs, 22.0% were used for non-agricultural programs, and 82.0% were used for materials preparation for the coming school year. It would seem from these data that more emphasis for summer use of facilities is placed in the Utah schools than in the out-of-state schools.

Table 8

Distribution of Hours per Week the Facilities are Used by Adults and Other Students

	Utah		Other States	
Hours	Number	Percent	Number	Percent
None	21	38.9	20	48.8
1-3 hours	17	31.5	14	34.1
4-6 hours	10	18.5	4	9.8
7-8 hours	2	3.7	2	4.9
More than 8 hours	4	7.4	1	2.4
N =	54		41	

In data contained in Table 10, it would appear 13.3% of the teachers in Utah viewed their shop facilities inadequate in all of the classes while 8.2% of the out-of-state teachers viewed their

shop facilities as inadequate. Of the teachers surveyed in Utah, 10.9% considered their classroom facilities inadequate but 8.2% of the other states' teachers assessed their classroom facilities inadequate. Based on these data, more of Utah's teachers consider their facilities inadequate for teaching vocational agriculture than out-of-state teachers.

Table 9

Summary of the Vocational Agriculture Facility Usage During the Summer Months by the Vocational Agriculture Teacher

	Utah		Other States	
Summer Usage of Facilities	Number	Percent	Number	Percent
Teaching Young and Adult Farmers	19	35.2	14	28.0
Teaching agricultural technology	9	16.7	4	8.0
Teaching interest groups not related to agriculture	15	27.8	11	22.0
Preparing teaching materials for coming school year	48	88.9	41	82.0
N =	54		40	

The objectives of the teachers in vocational agricultural programs as shown in Table 11, emphasized "training in all areas" by 35.2% of the teachers in Utah compared to 42.9% of the surrounding states' teachers. Extensive training in a few areas was the objective of 16.2% of the teachers in Utah, while 19.4% of other state teachers selected this objective. Twenty percent of the teachers in Utah indicated they were preparing their students for immediate job placement while 28.6% were preparing students for post secondary education. Similar

Table 10

Teachers' Perceived Adequacy of the Vocational Agriculture Facilities

Classes	Utah				Other States			
	Shop		Classroom		Shop		Classroom	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
All of the classes.....	13	28.9	24	52.2	21	42.9	33	67.3
Most of the classes....	13	28.9	13	28.3	13	26.5	8	16.3
Few of the classes.....	13	28.9	4	8.6	11	22.4	4	8.2
None of the classes....	6	13.3	5	10.9	4	8.2	4	8.2
N = ...	45		46		49		49	

data from other states indicated that 13.3% of the teachers were training for immediate job placement and 24.4% were preparing students for higher education. These data indicate that the general thrust in the education of high school students enrolled in vocational agriculture is towards generalized training in all areas.

Table 11

Teachers Perceived Objective of the Vocational Agricultural Program in their School

Vocational Agriculture Objectives	Utah		Other States	
	Number	Percent	Number	Percent
Provide some training in all areas	37	35.2	42	42.9
Provide extensive training in a few areas	17	16.2	19	19.4
Prepare students for immediate job placement	21	20.0	13	13.3
Provide background for post secondary education	30	28.6	24	24.4

From respondants in Utah concerning office facilities, the present office space ranged from 0 to 400 square feet with an average office size of 124.8 square feet. The recommended office space in Utah ranged from 50 to 400 square feet with an average of 180.8 square feet. Other states surveyed had office space ranging from 0 to 350 square feet with an average of 92.7 square feet of space for an office. The recommended space for an office by teachers from other

states ranged from 30 to 500 square feet of space with an average of 128.2 square feet.

As shown in Table 12, 20% of the offices did not have desks and 58% did not have a telephone. Windows for viewing the shop were evidenced by 37.5% of the teachers and 40% lacked adequate locks to insure the safety of the contents of the office.

Teachers from other states indicated slightly more efficient facilities with 71.4% having a phone and 55.1% being able to view the shop. The greatest need indicated was book shelves and bulletin boards by the teachers from outside of Utah.

Table 12

Teacher's Response of Vocational Agricultural Office Facilities

	Utah		Other States	
Office Contents	Adequate	Percent	Adequate	Percent
Desk	39	81.1	41	83.7
Telephone	20	41.7	35	71.4
Clock or bell	16	33.3	15	30.6
Extra chair(s)	26	54.2	32	65.3
Window for viewing classroom	24	50.0	25	51.0
Window for viewing shop	18	37.5	27	55.1
File cabinets	33	68.8	36	73.5
Bulletin boards	18	37.5	12	24.5
Book shelves	29	60.4	15	30.6
Security lock for Office	29	60.5	30	61.2
N =	48		49	

From data in Table 13, 8.9% of the classrooms in Utah are located in the shop, 75.6% separate from the shop but located in the same building, with 15.5% located in a separate building. Teachers from regional states indicated 10.4% of their classrooms were in the shop, 77.1% were separate from the shop but in the same building and 12.5% indicated their classroom was in a different building.

Table 13

Teachers Responses Indicating Location of the Vocational Agricultural Classroom

	Utah		Other States	
Location	Number	Percent	Number	Percent
In the shop	4	8.9	5	10.4
Separate from shop	34	75.6	37	77.1
In separate building	7	15.5	6	12.5
N =	45		48	

Respondents indicated that the classroom size in Utah ranged from 69 square feet to 1,683 square feet with an average of 739.4 square feet. Comparably, surrounding states indicated having classrooms ranging from 0 to 1,536 square feet of space with an average of 678.4 square feet. Interestingly enough, one of the teachers indicated that his classroom was in a hallway that had been blocked off.

In Table 14, all of the teachers in Utah had a chalkboard in their classrooms. Almost all had bulletin boards, overhead screens, book shelves and adequate lighting. Half of those responding show

inadequate sound protection in their classrooms and the lack of sinks or an intercom system.

In response to the questionnaire, concerning question 23 (see survey instrument), teachers indicated that largest class taught ranged from 14 to 35 students with 24 being the average number of students in the largest class in the state of Utah. Other surveyed states indicated that the class size ranged from 10 to 39 with an average of 29 students in their largest class.

In response to question 24 and 25, the teachers indicated the shop facilities in Utah ranged in size from 280 square feet to 14,000 square feet, with an average of 1,870.7 square feet in their present facilities. The teachers recommended size for the shop facilities averaged 1,748.2 square feet per student. In other states, shop sizes ranged from 50 to 5,400 square feet with an average of 2,882.8 square feet in thier present facilities and the teachers recommended an average of 866.5 square feet per student.

Relating to construction of projects, 29.0% of the teachers in Utah indicated their facilities were adequate while 40.8 percent of the teachers from surrounding states indicated their facilities were adequate. This could indicate an overall need for more space than what is provided in any of the states. Even though some of the shops were larger than the recommended shop size, the respondents still indicated inadequate space.

The data in Table 15 indicate that 30.2% of Utah's teachers perceive that machinery size and technology has had no effect on the facilities while 51.2% have indicated that this change has resulted in the need for additional facilities being provided.

Teachers surveyed in other states answered this question with 59.6% indicating that machinery size has had an effect on facilities and 38.3% indicating the need for additional facilities to be provided.

Table 14

Summary of the Distribution of Teachers' Responses to the Contents of their Vocational Agricultural Classroom

	Utah		Other States	
Classroom Contents	Number	Percent	Number	Percent
Chalkboard	49	100.0	48	100.0
Bulletin Board	44	89.8	45	93.8
Overhead Screens	45	91.8	42	87.5
Overhead Projector	39	79.6	40	83.3
Tape Recorder	29	59.2	26	54.2
Book Shelves	44	89.8	47	97.9
Filing Cabinets	33	67.4	29	60.4
Sinks	22	44.9	25	52.1
Intercom-Systems	23	46.9	33	68.8
A Desk	42	85.7	42	87.5
Window Shades (for films)	36	73.5	34	70.8
Light Switch (front and back)	30	61.2	28	58.3
Adequate Lighting	40	81.6	44	91.7
Adequate Heating and Cooling	39	79.6	32	66.7
Adequate Sound Protection from Shop Noise	25	51.0	18	37.5
A Clock	36	73.5	37	77.1
N =	49		48	

Table 15

Teachers' Perceived Effect of Machinery Size and Technology Changes on Facility Needs

Machinery Size and Technology	Utah		Other States	
	Number	Percent	Number	Percent
Had no effect on facilities	13	30.2	19	40.4
Had limited the use of facilities	8	18.6	10	21.3
Required additional facilities be provided	22	51.2	18	38.3
N =	43		47	

Table 16 contains data concerning restroom facilities. The data shows 26.9% of Utah's agricultural facilities were originally equipped with restrooms and 9.6% have added or have plans to add facilities. There were 63.5% who indicated they had no plans for adding these facilities. By comparison, other surveyed states indicated 37.8% of the facilities were originally equipped with restrooms, 15.5% having added or have plans to add facilities with 46.7% of the respondents having no plans to add restroom facilities.

Data contained in Table 17 indicates the number and percentage of agricultural teachers teaching the five major thrusts of vocational agricultural mechanics. From these data, a comparison of Utah teachers and the teachers from other states indicates the emphasis on the different programs. Approximately 22% more teachers in Utah teach farm power. The data indicate machinery assembly and

adjustments is taught by fewer teachers than any other portion of the farm power program. The data also show fewer teachers perceive their facilities as being adequate for teaching this specific area.

The other four areas of the agricultural mechanics program were taught by a higher percentage of teachers from out-of-state. Nearly 30 percent more of these teach soil and water management, seven percent more teach farm building and construction, five percent teach basic farm skills and approximately ten percent more of the out-of-state teachers teach basic electricity.

The data also show that basic farm skills such as welding are taught by more teachers than any other area and soil and water management is taught by fewer Utah teachers than any other area. Out-of-state teachers, as shown in Table 17, teach less electricity than any other area.

Out-of-state teachers indicated throughout the data their facilities were more adequate in every area than were the Utah facilities. This might be an indication why a higher percentage of the out-of-state teachers are teaching these program areas in agricultural mechanics.

An inspection of the data in Table 18 indicate that 22.7% of the facilities in Utah have been color coded according to safety standards, 15.9% plan to color code and 11.4% of the teachers did not know what the color codes were. Upon comparison, it can be noted that 21.7% of the facilities in surrounding states have been color coded, 10.9% plan to color code and 4.3% of the teachers did not know what the codes were. These data indicate a need for coding information and encouragement in color coding the facilities.

Table 16

Teachers' Responses to Restroom Facilities Available for Male and Female Students in the Present Vocational Agriculture Building

	Utah		Other States	
Available Restrooms	Number	Percent	Number	Percent
provided in original construction	14	26.9	17	37.8
have been added	1	1.9	4	8.9
plans for facilities are underway	4	7.7	3	6.6
there are no plans for facilities	33	63.5	21	46.7
N =	52		45	

Table 19 contains data showing that 65.4% of the teachers make tools and equipment available to students in Utah shops by allowing free access to them. In other states surveyed, 87.5% of the teachers make their tools available to students by allowing free access to them.

Approximately 30% of the Utah teachers indicate in Table 20 that equipment loss and misuse is controlled in the shop facilities primarily by having cupboards provided. The out-of-state teachers control equipment misuse primarily by marked tool boards. Even though control is distributed among all the methods, free access is shown in the data as the least chosen way of controlling tool loss and misuse.

As indicated in Table 21, the most common item in the facilites of Utah as well as the Western Region facilities was the drinking fountain. Many parts of the facility such as a paint room, paint

Table 17

Teachers' Response to Agriculture Mechanics Instructional Program Emphasis

Instructional Program Emphasis	(Taught) Utah Number	Utah Percent	Other States Number	Other States Percent	(Facilities Available) Utah Number	Utah Percent	Other States Number	Other States Percent
Agricultural Mechanics (Farm Power)								
Small engines	33	75.0	30	63.8	23	52.3	32	68.1
Tractor power and maintenance	30	68.2	33	70.2	18	40.9	24	51.1
Machinery assembly and adjustments	11	25.0	20	42.6	9	20.5	19	40.4
Soil and Water Management								
Land surveying	20	45.5	38	80.9	18	40.9	30	63.8
Irrigation layouts	10	22.7	22	46.8	N/A*	N/A*	N/A*	N/A*
Livestock wastes (handling and disposal)	11	25.0	16	34.0	N/A*	N/A*	N/A*	N/A*

*N/A = Not Applicable

Table 17 (continued)

Instructional Program Emphasis	(Taught) Utah Number	Utah Percent	Other States Number	Other States Percent	(Facilities Available) Utah Number	Utah Percent	Other States Number	Other States Percent
Farm Building and Construction								
Building materials selection	30	68.2	40	85.1	23	52.3	30	63.8
Livestock buildings and facilities	28	63.6	31	66.0	19	43.2	22	46.8
Farmstead planning and layout	21	47.7	24	51.1	21	47.7	19	40.4
Basic Farm Skills								
Oxygen acelylene	42	95.5	47	100.0	37	84.1	41	87.2
Arc welding	42	95.5	47	100.0	35	79.5	42	89.4
Tool and equipment operation	41	93.2	47	100.0	32	72.7	39	83.0
Project construction	41	93.2	46	97.9	30	68.2	33	70.2
Electricity								
Basic wiring and repairs	29	65.9	35	74.5	23	52.3	27	57.4
Motors	15	34.1	24	51.1	16	36.4	23	48.9
ELectrical controls	12	27.3	14	29.8	16	36.4	19	40.4
N =	44		47		44		47	

Table 18

Summary of Teachers' Responses Indicating Color Coding Of the Shop Facilities

	Utah		Other States	
Shops Color Coded	Number	Percent	Number	Percent
Yes, they are	10	22.7	10	21.7
I plan to	7	15.9	5	10.9
I am not sure what the codes are	5	11.4	2	4.3
No, they aren't	22	50.0	29	63.0
N =	44		46	

Table 19

Distribution of Teachers' Responses on Means of Making Tools Available to Students in the Shop

	Utah		Other States	
Tools Made Available by	Number	Percent	Number	Percent
checking out of the tools	7	13.5	6	12.5
assignment of the tools each day	6	11.4	0	0.0
tools assigned at start of year	4	7.7	0	0.0
having free access to the tools	34	65.4	42	87.5
N =	52		48	

Table 20

Summary of Teachers' Responses to Means of Controlling Equipment Loss and Misuse

	Utah		Other States	
Means Used	Number	Percent	Number	Percent
a locked toolroom	18	26.9	14	22.2
cupboards provided	20	29.9	17	27.1
marked tool boards	16	23.9	21	33.3
free access to all the tools	13	19.3	11	17.4
N =	67*		63*	

*Some teachers marked more than one choice, hence the inflated N.

storage room, storage racks and other necessary items were found in only a small portion of the facilities. This would indicate that basic items should be installed in every shop to help provide adequate use of that shop facility. Very few teachers indicated loading ramps available, the data, however, do not show whether these are actually needed.

Other facilities recommended in addition to those shown in Table 21 are shown in Appendix A.

As shown in Table 22, the average size of a paint room recommended by 72% of the teachers in Utah was 20 x 30 feet. Sixty-eight percent of the teachers from other states recommended this same size. Only 23% of the teachers in Utah recommended a smaller size paint room which was comparable with the 23% of the other teachers recommending the smaller size. See Appendix B for other recommendations.

Table 21

The Distribution of Teachers' Responses for Contents of Shop Facilities

Contents	Utah		Other States	
	Number	Percent	Number	Percent
tool board	11	21.6	29	59.2
tool cupboard (with lock)	33	64.7	31	63.3
separate tool room (with lock)	29	56.9	32	65.3
overhead hoist	33	64.7	21	42.9
wood racks	20	39.2	26	53.1
metal racks	34	66.7	26	53.1
exhaust system for engines	21	41.2	9	18.4
paint room	17	33.3	7	14.1
paint storage room	14	29.4	10	20.4
outside storage area	23	45.1	22	44.9
floor drains	32	62.7	30	61.2
loading ramps	5	9.8	2	4.1
first aid station	21	41.2	21	42.9
drinking fountain	35	68.6	34	69.4
N =	51		49	
Others*				

*See Appendix A

Table 22

Summary of Teachers' Responses for Recommended Paint Room Size

	Utah		Other States	
Recommended Size	Number	Percent	Number	Percent
20' x 20'	9	23.1	10	22.7
20' x 30'	28	71.8	30	68.2
Larger than 20' x 30'	2	5.1	4	9.1
N =	39		44	

The data in Table 23 indicate the number of facilities which contain surroundings that are beneficial in providing efficient and attractive working conditions. Of the Utah teachers surveyed, 29.4% indicated their facilities did not have a paved driveway, 80.4% lacked the room to drive through the facilities, and 70.6% did not have attractive facilities to invite a learning atmosphere. By comparison, 56.3% of the other states surveyed had a paved driveway, 81.2% lacked room to drive through the facilities, and 62.5% did not have attractive facilities to attract the students to an environment conducive to learning.

Of the teachers responding to the question of maintenance, 50% of the Utah teachers indicated that adequate maintenance was received for their present facilities. Of the out-of-state teachers surveyed, 55% indicated their facilities were being adequately maintained.

The data in Table 24 indicate that in Utah, the most common capital budget range was $500.00 to $999.00 or $2,000.00 to $2,500.00 with

Table 23

Summary of the Teachers' Perceptions of Beneficial Surroundings Providing Protection and Efficiency to Vocational Agricultural Facilities

Beneficial Surroundings that Enhance Efficiency	Utah		Other States	
	Number	Percent	Number	Percent
a paved entrance and driveway	36	70.6	27	56.3
room to drive completely through the shop area	10	19.6	9	18.8
room for the construction of larger projects	24	47.1	21	43.8
no obstructing poles or other structures	25	49.0	24	50.0
adequate lighting to reduce theft	22	43.1	23	47.9
fenced area for storage (can be locked)	33	64.7	22	45.8
an attractiveness that invites learning	15	29.4	18	37.5
loading ramps for equipment	4	7.8	2	4.2
N =	51		48	

both being equal in the percentage of teachers receiving a budget. From teachers' responses, the capital budgets actually ranged from $500.00 to $3,000.00 with an average capital budget of $1,635.00.

An operating budget range of $1,000.00 to $1,499.00 in Utah as indicated by 33.3 percent of the teachers was most common. The range was from $200.00 to $5,000.00 with an average of $1,577.77. Of the 54 teachers responding in Utah, 64.8% did not know what their budgets were.

By comparison, 29.6% of the teachers from other states indicated a range of $1,000.00 to $1,499.00 as being the most common capital budget. These teachers also indicated this range as being the most common operating budget.

From the teachers' responses from the regional states, the actual capital budget ranged from $0.00 to $12,785.00 with $1,480.26 being the average. The operating budget ranged from $0.00 to $12,785.00 with $2,231.93 being the average. Of the 50 teachers responding from out-of-state, 46% did not know their budget allowances.

Of the 18 teachers responding to this question in Utah, the data in table 25 indicate that approximately one third received from $1.00 to $15.00 per student in their capital budget. The actual budgets ranged from $.70 to $111.00 per student with an average of $33.35 per student. Of the 54 teachers responding in Utah, 35 or better than two thirds did not know what their budget was.

Teachers from out-of-state indicated a lower range with 22% receiving less than $1.00 per student hour. A total of seven teachers indicated receiving less than $1.00 per student. (See Appendix C). Actual budgets ranged from $0.00 to $300.00 with an average of $49.19 per student hour. Of the 50 teachers responding from other states, 23 did not know their budgets.

Several comments from teachers were made, contrasting the budget for agricultural mechanics with the budget for sports in the school. Each time, the budget was considerably lower than the budget allowed for sports. One teacher even indicated that the students had to furnish their own metal in a welding class because there was no budget to facilitate such classes. (See Appendix E for further detail).

Table 24

Summary of Teachers' Responses for
Budget Received for Agricultural Mechanics

	Utah		Other States	
Capital	Number	Percent	Number	Percent
Less than $500	0	0.0	6	22.2
$500 - $999	5	27.8	5	18.4
$1,000 - $1,499	3	16.7	8	29.6
$1,500 - $1,999	3	16.7	3	11.1
$2,000 - $2,500	5	27.8	1	3.7
More than $2,500	2	11.0	4	14.8
N =	18		27	
Range received from survey $500 - $3,000				
Average capital budget in Utah - $1,635				
Average capital budget in other states - $1,480.26				
Operating				
Less than $500	2	11.1	6	18.2
$500 - $999	3	16.7	6	18.2
$1,000 - $1,499	6	33.3	8	24.2
$1,500 - $1,999	2	11.1	4	12.1
$2,000 - $2,500	2	11.1	3	9.1
More than $2,500	3	16.7	6	18.2
N =	18		33	
Range received from Survey--$200 - $5,000				
Average operating budget in Utah - $1,577.77				
Average operating budget in other states - $2,231.93				

Table 25

Distribution of Responses for the
Agricultural Mechanics Budget Received Per Student Hour

	Utah		Other States	
Per Student Hour	Number	Percent	Number	Percent
Less than $1	1	5.6	6	22.2
$1 - $15	6	33.3	4	14.8
$16 - $30	3	16.6	4	14.8
$31 - $45	3	16.6	2	7.4
$46 - $60	2	11.1	3	11.1
$61 - $75	1	5.6	3	11.1
$76 - $100	1	5.6	3	11.1
More than $100	1	5.6	2	7.4
N =	18*		27**	

*From Utah, 35 teachers, (64.8%) did not know their budget.

**From out-of-state, 23 teachers (46.0%) did not know their budget.

***See Appendix D.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to compare the agricultural facilities found in the high schools in Utah with those in other states selected from the Western Region. More specifically, it was to:

1. Compare agricultural facility needs of high schools in the Western Region with those within the state of Utah.

2. Determine if the agricultural shop facilities being used in Utah and various states facilitate and encourage learning.

3. Determine which students are using the present facilities.

4. Determine to what extent the facilities are being used by non-high school students.

5. Determine the physical dimensions, major equipment capabilities, and major program thrusts in vocational agricultural shops.

6. Determine the present ratio of funding provided for the number of students being taught based on student hours.

From these comparisons, universal needs would be evident and the proposal of new standards would be relevant and of benefit to the vocational agricultural instructors in Utah.

Data were collected through use of a mailed questionnaire completed by 54 Utah vocational agricultural teachers and 10 vocational agricultural teachers randomly selected from each of the following seven states in the Western Region. The states involved were Arizona, Colorado, Idaho,

Montana, New Mexico, Nevada, and Wyoming. By randomly selecting the ten agricultural teachers from these states, a sample comparable to the teachers surveyed in Utah would provide enough information to reasonably compare facility sizes, contents, program thrusts, and budgets.

Through the use of the questionnaire mailed to the agricultural teachers, information concerning their present facilities as well as their perceived needs and recommendations was gathered.

Based on the data, schools in Utah tend to have more students in the agricultural mechanics programs than was indicated by the other schools surveyed. Facility sizes of Utah schools are very comparable to facility sizes of the other states. This would indicate a greater overload of facilities and teacher resources in the shop and classroom. The teachers in both groups indicated excessive use of facilities and expected teacher loads due to more students using the facilities than they perceived could be effectively taught.

The data show more non-vocational students are using the facilities in Utah than in the other states. To further complicate the problem, the respondents from Utah indicated a greater number of 7th and 8th grade students are using the vocational agricultural facilities as compared to other states. The teachers in Utah indicated they use the facilities more than the teachers in the other states surveyed during the summer months for teaching Young and Adult Farmer programs and other special interest groups. A large percentage of both groups indicated the use of facilities for the preparation of teaching materials for the coming school year.

The objectives of the teachers in the agricultural programs

emphasized "training in all areas" by the greatest percentage of the teachers. Out-of-state teachers indicated their second objective was providing background information for post secondary education while Utah's second objective was preparing students for immediate job placement.

Teachers in Utah had larger offices than did the teachers from other states. They also indicated a need for larger offices. Teachers from the other states recommended larger offices also, but their recommendations were, for almost the same amount of space now serving the teachers in Utah.

From the survey question concerning the contents of the office, the data for Utah schools indicate nearly 20% of the teachers did not have a desk, 60% lacked a telephone, and 40% did not have a security lock on the door. Data for out-of-state schools was very similar except for a substantial increase in the number of telephones in the offices. Of these teachers, 30% did not have a telephone.

Three-fourths of all the classrooms, as indicated by the data, were separate from the shop but in the same building. Utah and other state respondents indicated that classroom size was comparable with 60 square feet of space difference between the average classroom sizes. In addition to comparable classroom sizes, the contents of the classroom were very similar. The greatest difference was in the book shelves and intercom-systems. In-state and out-of-state teachers indicated inadequate sound protection from shop noises.

Of the educational thrusts in vocational agriculture, the data indicate that the percentage (94.3) of teachers in Utah teaching basic farm skills such as welding is decidedly greater than any other area

being taught. Data from out-of-state indicate that these teachers (99.5%) put even stronger emphasis in this area.

In regard to space for project construction, 61% of all the vocational agricultural teachers viewed their facilities as inadequate to facilitate the construction of their projects. This inadequacy is shown in the number of teachers who indicated a need for additional facilities to be built to accomodate the changes in machinery size and technology. Nearly two thirds of the teachers from other states indicated this need while half of the Utah teachers indicated a similar need.

A low percentage of the facilities were equipped with restrooms and, surprisingly, 63.5% of the teachers in Utah do not have plans for adding these facilities. Less than half of the teachers from other states indicate no plans to add those facilities.

Very few of the shop areas have been color coded to meet safety standards. Fifteen percent plan to color code with 50% indicating no such plans in Utah. Comparably, 10.9% of the teachers from out-of-state plan to color code with 63% indicating no plans for color coding.

Tools are made available to the students by a majority of the teachers by permitting free access to them. Tool loss and misuse is controlled in Utah primarily by providing cupboards for the tools. Teachers in other states stressed the marked tool board as being the most widely used.

The contents of the shop are comparable in both Utah facilities and facilities in other states. A loading ramp is the least common item found but the data do not indicate whether a real need exists for

ramps. The data do indicate, however, that the facilities have definite room for improving the efficiency of the shop area. If loading ramps were available, this could enhance expansion of agricultural machinery interaction.

A majority of the teachers from Utah as well as other states indicated a paint room 20' x 30' as being the size most often recommended. Of special concern was the low number of teachers indicating the surroundings of the facilities as being attractive and appealing to the students.

The capital budget outlay in Utah averages $1,635.00 while other states indicated an average capital budget outlay of $1,480.00. The operating budget in Utah averaged $1,578.00 while other states indicated an operating budget of $2,232. Two-thirds of the Utah teachers did not know their budget allowances and 45% of the teachers in other states did not know their budget allowances. Teachers in Utah received $33.35 per student hour and teachers from the other states received $49.19 per student hour. This was based on total budgets divided by the total number of student hours.

Conclusions

From the responses to the questionnaire, the data indicate that over 80 percent of the total teachers surveyed in Utah have an agricultural mechanics program. From this, it can be concluded that agricultural mechanics is an on-going and important part of the school curriculum. Although the schools had a wide range in student numbers, there was no indication in the data that the larger schools tend to have better programs or vice versa.

Utah schools have fewer agricultural mechanic facilities than out-of-state schools but are serving a larger population increasing the ratio of students to teachers.

Surprisingly, with the larger student populations and the same percentages of agricultural facilities in Utah as the schools from the other states, it would appear that there would be greater restrictions on students taking vocational classes. The opposite proved to be true with 4.2% more of the Utah teachers teaching 7th and 8th grade level classes than were the out-of-state teachers.

Teachers in Utah use the facilities approximately 10% more than the teachers in other states for teaching Young and Adult Farmers and other interest groups. This increases the usage of facilities and also increases the student-teacher ratio substantially.

The average number of students in the largest agricultural mechanic classes in Utah was 24 students while other states indicated an average number of 20 students. Due to larger student populations in the Utah schools, this response was expected. It was also expected that shop facilities would increase proportionately with student numbers. Unfortunately, the data showed a decrease in the facility size. Out-of-state schools had an average shop size of 2,882.8 square feet in their present facilities while Utah schools had only 1,870.7 square feet in their existing shops. These data indicate perhaps that Utah teachers are being expected to teach greater numbers of students with much less space. It is no wonder that the recommended shop size was so different between Utah and other states' teachers. Utah teachers recommended twice as much space per student as did the out-of-state teachers.

From the responses of the Utah teachers, it was reported that approximately 20% did not have a desk, 60% did not have a telephone, and 40% lacked adequate locks. The efficiency could and should be questioned pertaining to the real purpose of an office with such items missing.

Regardless of the facility and the student numbers, the teacher owes it to himself and to the students to have a classroom conducive to learning and capable of facilitating the needs of students. The contents of the classrooms of the teachers surveyed in Utah seemed quite adequate with the exception of sinks, intercom-systems, and sound protection from shop noises. Out-of-state teachers indicated that sound protection was the least adequate, followed by sinks and audio-equipment. Since a major part of the cognitive learning takes place in the classroom, this adequacy in Utah classrooms was a boost to the agricultural mechanics program.

Of the five major thrusts of agricultural mechanics, namely farm power, soil and water management, farm building and construction, basic farm skills, and electricity, the data indicate that basic farm skills such as welding and equipment and tool usage, were taught by 94% of the Utah teachers and nearly 96% of the out-of-state teachers. These data were expected to be very high because many teachers seem to consider welding to be the agricultural mechanics program. This is evident through a percentage comparison of the other areas of agricultural mechanics in Utah. Thirty percent fewer teachers taught farm building and construction, 38% fewer taught farm power, 52% fewer taught electricity, and an unbelievable 63% fewer teachers in Utah taught soil and water management than those teaching welding. Though not as drastically, out-of-state

teachers showed the same decrease in areas taught, with welding being taught by the largest percentage of the teachers. Since this trend is so prevelant in the high schools, there has to be a reason. The data reveal that facilities are available for teaching welding and other basic skills in approximately 80% of the schools. Interestingly, the percent of facilities available corresponds directly with the percentage of teachers teaching the different areas of the agricultural mechanics program. Whether the availability of facilities is dependent upon the budget, the teachers own abilities or personal preferences are not indicated by the data. It is evident, however, that a complete and thorough job of teaching agricultural mechanics is lacking in most of the schools surveyed and facilities are not presently available to teach these areas according to the respondents.

The contents of the shops are dependent upon the skills taught and the extensiveness of that training. There are some things, however, that should be found in every shop. The data show that the drinking fountain is the most common element in the facility. Sixty-eight percent of the teachers in Utah and 69% of the out-of-state teachers had a fountain. Such basic equipment as overhead hoists, paint rooms, storage racks, exhaust systems, and first aid stations were much more limited. There is an existing need for these materials to be provided to utilize available space and provide safe, efficient working conditions. From the data, it can be concluded that Utah facilities were equivalent to or better equipped than the out-of-state facilities except for tool boards, tool rooms, and storage racks. This is commendable for Utah but still shows deficiency in the contents of the shop compared to what it could and should be equipped with.

From data received concerning the budgets of the agricultural teacher, the most striking observation is that few teachers knew their capital or operating budget. From 54 teachers responding in Utah, 35 teachers or 64.8% did not know their budget allowances. From those who did know their budget allowances, the data indicate that the average capital budget was $1,635.00 and the average operating budget in Utah was $1,577.77. In comparison, the teachers from out-of-state indicate that the average capital budget was $1,480.26 while the average operating budget was $2,231.93 for the year. This means that with larger student numbers, more students per class, and more outside use of facilities, Utah is receiving approximately $500.00 less per year for each school.

Once more it would appear that Utah teachers are trying to accomplish as much with less available than are teachers in the other states surveyed in the Western Region. With this type of budgeting, it is no wonder that agricultural facilities are producing below their potential. Student numbers can be, and are indeed, affected by what the agricultural program offers them in the way of skills development, and knowledge. It should be noted, however, that some percentage error may have occurred because of the number of teachers not knowing their budget or not responding. Nevertheless, efforts must be made to bring Utah's facilities up to at least the level of the facilities in the surrounding states and hopefully to a level conducive to optimum student growth. Some very interesting statements from teachers are recorded in Appendix D & E.

Recommendations

Through further research and the utilization of data obtained in this study, it is proposed that the following recommendations be considered as a minimum goal:

1. Acceptable recommendations for the vocational agricultural teacher to help in the organization, expanding, and building of facilities.

2. Recommendations that will promote adequate facilities, thereby providing a safe learning atmosphere for the students as well as the longevity of the equipment and facilities.

3. Recommendations that would increase the efficiency and enhance the ability of the instructor.

4. Standards that can avoid or at least minimize problems in improper design or out-of-date facilities based on present-day and future needs. For example, "How many of the shop facilities established in Utah were originally equipped with restrooms for girls in the shop?" or "Are adequate storage facilities available?"

5. Recommendations for funding based upon the number of student hours being taught and the needs of the facility to increase the efficiency as well as the safety of students.

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APPENDICES

APPENDIX A

Suggested contents of the shop facilities by teachers responding to the questionnaire.

1. Welding booths
2. Welding exhausts
3. Air conditioner
4. Wash-up area
5. New paint
6. Ventilation system
7. Pressure washer
8. Parts storage area
9. Electrical outlets
10. Instructional supply room
11. More room for project storage
12. Floor sumps
13. Air compressor
14. Large doors
15. Dust system
16. Team room
17. Work benches
18. Clean-up area with lockers
19. Heaters
20. Steam cleaning platform
21. Restrooms

APPENDIX B

Paint room sizes suggested by vocational agricultural teachers other than those found on the questionnaire.

1. 16' x 34'
2. 18' x 36'
3. 10' x 15'
4. 20' x 40'
5. 30' x 60'
6. "I have to paint outside because a paint room is not available."
7. "Depends on size of equipment."
8. Large enough for a combine

APPENDIX C

Amount of budget received per student hour of less than $1.00 as specified by the vocational agricultural teachers' responses:

1. .00
2. .06
3. .16
4. .30
5. .35
6. .40
7. .70

APPENDIX D

Comments of teachers concerning their budget allowance:

1. "Purchase order is used so we never see the money."
2. "I have no complaints about funding, I just have to be a politician."
3. "I don't know what my budget is and I don't worry about it because what I need and if I can show a need, the school district usually will buy materials and equipment."
4. "I don't know, nor can I find out."
5. "Depends on what we need."
6. "I don't know what my budget is. I have been using FFA funds to finance the shop classes."
7. "No idea!"
8. "A good question. I doubt anyone outside of administration will ever know. It is very, very secret."
9. "The district won't tell me."
10. "We have never been told."
11. "I have no idea."
12. "Have no budget."
13. "No actual budget. We have to order everything one year in advance."
14. "Because of low budget, we have to build projects and sell them to the public."
15. "Students provide their own metal and equipment because my budget only covers welding rods."

APPENDIX E

Comments of teachers in regards to their budget and the budget of other school activities.

1. "If we could bounce a basketball in the shop, we would get a tremendous increase in the budget."

2. "They must think they can feed the world with a basketball."

3. "School athletic budget is about four times as high as our budget."

4. "I am tired of competing with the school athletic programs for budgets, time, or student participation."

APPENDIX F

Ray J. Tubbs
Utah State University
Agricultural Education UMC 48
Logan, UT 84322
January 30, 1979

Mr. Department Head
College of Agriculture
University of State
Your Town, Please 00000

Dear Mr. Department Head:

I am currently doing a study of facility standards for the vocational agriculture facilities (i.e. the classroom and the shop).

By gathering standards from other states and comparing them to the present facilities in Utah, I hope to be able to make recommendations that will improve our facilities.

If you could locate and send me any standards that might be of benefit, it would be greatly appreciated.

Enclosed is a stamped, self-addressed envelope for your convenience. Thanks for your cooperation in this endeavor.

Sincerely yours,

Ray J. Tubbs

enclosure

APPENDIX G

February 5, 1979

Dear Instructor:

The enclosed questionnaire concerned with your present facilities and the facilities needed for effective vocational agricultural education is part of a Western Regions study being carried out by Utah State University.

This study is concerned specifically in gathering input about facilities so that useful and necessary standards regarding facilities (i.e. shop, classroom, office) can be adopted in the state of Utah.

The questionnaire is being sent to randomly selected vocational agriculture educators, like yourself, to compare how present facilities are perceived.

We are particularly interested in feedback from teachers on the job because of the awareness of existing needs concerning the facilities. The enclosed questionnaire will help establish those needs and greatly assist in making reasonable and reliable considerations of the facility requirements.

You are one out of ten teachers selected from your state, so it is essential that you respond if we are to receive complete coverage. It is desirable that you complete the questionnaire prior to February 20 and return it in the stamped, addressed envelope that is enclosed.

Thank you for your time and cooperation in this matter.

Sincerely,

Ray J. Tubbs
Graduate Student, Ag. Education

enclosure

Ray J. Tubbs
Utah State University
Agricultural Education UMC 48
Logan, UT 84322
February 26, 1979

Dear Instructor:

The enclosed questionnaire concerned with your present facilities and the facilities needed for effective vocational agriculture education is part of a Western Regions Study being carried out by Utah State University.

This questionnaire is being sent as a follow-up to an original letter and questionnaire sent February 5th. Due to an oversight in filling out the questionnaire or to the mailing service, I never received the original back from you.

If it has recently been mailed, please disregard this follow-up. If not already mailed, would you please fill out this questionnaire and return it as soon as possible. This will enable me to tabulate the information and make recommendations for new facilities.

Thank you for your time and prompt cooperation in this matter.

Sincerely,

Ray J. Tubbs
Graduate Student
Agricultural Education

APPENDIX H

QUESTIONNAIRE

Directions--Mark each blank that applies to your present situation with an (X). Some questions call for your input or need more than one answer.

1. Do you have a vocational agricultural mechanics program in your school? yes___ no___

2. How large is the school where you are employed? _____

3. How long have you taught at this high school? _____

4. How long have you taught vocational agriculture? _____

5. Specify the number of vocational agriculture students in your agricultural mechanics program. _____

6. How many vocational agriculture students are using the vocational agriculture shop facilities?
   less than 20___ 40 - 59___ 80 - 99___
   20 - 39___ 60 - 79___ 100 or more___

7. How many non-vocational agriculture high school students are using the shop facilities and classroom each day?
   less than 20___ 40 - 59___ 80 - 99___
   20 - 39 ___ 100 or more___

8. The facilities are used for teaching (vocational and non-vocational agriculture)...
   7th and 8th graders___ 10th graders___ 12th graders___
   9th graders___ 11th graders___ others (adults) ___

9. The number of students I can effectively teach in my present facilities per class is...
   classroom___ shop___

10. How many hours per week is the vocational agriculture shop used by other than high school students (i.e. night classes, adult and young farmers)?
    none___ 4 - 6 hours___ 10 or more ___
    1 - 3 hours___ 7 - 8 hours___

11. For how many class periods are the agricultural facilities shared by teachers other than vocational agriculture teachers each day?
    classroom___ shop___

12. Are the vocational agriculture facilities used by the vocational agriculture instructor during the summer months for...

	yes	no
(a) teaching young farmers and adult farmers	___	___
(b) teaching interest groups not related to agriculture	___	___
(c) teaching agricultural technology	___	___
(d) preparing teaching materials for coming school year	___	___

13. This shop facility is adequate for present student numbers in...

(a) all of the classes ___
(b) most of the classes ___
(c) few of the classes ___
(d) none of the classes ___

14. This classroom facility is adequate for present student numbers in...

(a) all of the classes ___
(b) most of the classes ___
(c) few of the classes ___
(d) none of the classes ___

15. The object of our vocational agriculture program is to (check a & b)

(a) provide some training in all areas ___
(a) provide extensive training in a few areas ___
(b) prepare students for immediate job placement after high school ___
(b) provide background for post secondary education ___

16. My office contains approximately _____ sq. feet.

17. I would recommend an office have a minimum of _____ sq. feet.

18. My office contains the following:

desk	___	extra chair(s) for student conferences	___
telephone	___	window for viewing the classroom	___
clock or bell	___	window for viewing the shop	___

19. My office adequately contains the following:

	adequate	Non-adequate
file cabinets	___	___
bulletin boards	___	___
book shelves	___	___
security lock	___	___

20. The classroom is located:
(a) in the shop ___
(b) separate from the shop but in same building ___
(c) in a separate building ___

21. This classroom contains _____ sq. feet.

22. This classroom contains.....(check articles applicable)

chalkboard	___	window shades (for movies)	___
bulletin board	___	light switches (front and back of room)	___
overhead screens	___	adequate lighting	___
overhead projector	___	adequate heating and cooling	___
tape recorder	___	adequate sound protection from shop noises	___
bookshelves	___	a clock	___
filing cabinets	___		
sinks	___		
intercom system	___		
a desk	___		

23. My largest class contains _____ students.

24. My shop facilities contain approximately _____ sq. feet.

25. I would recommend a shop have a minimum of _____ sq. feet per student.

26. Is adequate space provided in the shop for construction of projects?
yes___ no___

27. The change in machinery size and technology in my community...
(a) has had no effect on facilities___
(b) has limited the use of facilities ___
(c) requires additional facilities be provided___

28. The vocational agricultural facility was equipped with restroom facilities for male and female students...
(a) in the original construction___
(b) have been added___
(c) plans for facilities are underway___
(d) there are no plans for facilities___

29. Of the five major thrusts of agriculture mechanics, I teach... (indicate if area is taught and if adequate facilities are available).

	Taught		Facilities Available	
Agricultural Mechanics (Farm Power)	yes	no	yes	no
small engines	___	___	___	___
tractor power and maintenance	___	___	___	___
machine assembly and adjustments	___	___	___	___
Soil and Water Management				
land surveying	___	___		
irrigation layouts	___	___	N/A	N/A
livestock wastes (handling and disposal)	___	___	N/A	N/A

Farm Building and Construction	Taught yes	Taught no	Facilities Available yes	Facilities Available no
building materials selection	___	___	___	___
farm animal buildings and facilities	___	___	___	___
farmstead planning and layout	___	___	___	___
Basic Farm Skills				
oxygen acetylene	___	___	___	___
arc welding	___	___	___	___
tool and equipment operation	___	___	___	___
project construction	___	___	___	___
Electricity				
basic wiring and repairs	___	___	___	___
motors	___	___	___	___
electrical controls	___	___	___	___

30. The shop area has been color coded according to safety standards..
    (a) yes, they are___
    (b) I plan to___
    (c) I am not sure what the codes are___
    (d) no, they aren't ___

31. During class, tools and equipment in the shop are available to my students by:
    (a) checking out the tools___
    (b) assignment of the tools each day ___
    (c) tools assigned at start of year ___
    (d) having free access to the tools ___

32. Equipment misuse of loss is controlled by...
    (a) a locked tool room ___
    (b) cupboards provided ___
    (c) marked tool boards ___
    (d) free access to all the tools ___
    (e) other___

33. Our shop contains the following facilities...

tool board ___	paint room ___
tool cupboards (with lock)___	paint storage room ___
separate tool room (with lock)___	outside storage area___
Overhead hoist ___	floor drains___
wood racks___	loading ramps___
metal racks ___	first aid station___
exhaust system for engines___	drinking fountain___

List any other facilities you feel are necessary: _____
_____
_____

34. The minimum size of a painting room I would recommend for agricultural facilities is:
20' x 20' ___ larger than 20' x 30' (specify) _____
20' x 30' ___

35. The outside surroundings are beneficial to our facilities because there is:
(a) a paved entrance and driveway ___
(b) room to drive completely through the shop area___
(c) room for construction of larger projects ___
(d) no obstructing poles or other structures
(e) adequate lighting to reduce theft ___
(f) fenced area for storage (that can be locked) ___
(g) an attractiveness that will invite learning___
(h) loading ramps for equipment ___

36. Do the present facilities receive adequate maintenance?
yes___ no___

37. These facilities need the following maintenance:
1.
2.
3.

38. How much are you allowed for your total budget in Agriculture Mechanics? (Not including teaching salary)

a. capital $_____

b. operating $_____

39. What is your Agricultural Mechanics budget per student hour? (One student, two hours per day = two student hours)

VITA

Ray J. Tubbs

Candidate for the Degree of

Master of Science

Thesis Title: A COMPARISON OF VOCATIONAL AGRICULTURAL FACILITIES IN UTAH HIGH SCHOOLS AND THOSE IN SELECTED STATES OF THE WESTERN REGION AS PERCEIVED BY VOCATIONAL AGRICULTURE TEACHERS.

Major Field: Agricultural Education

Biographical Information:

Personal data: Born in Malad, Idaho on July 15, 1953, the son of Mr. and Mrs. Orvil Tubbs

Education: Attended and graduated from Malad High School, Malad Idaho in 1971. Attended Rick's College at Rexburg, Idaho majoring in Forestry. Graduated with Associate Degree in 1975. Attended Utah State University, majoring in Agricultural Education, received the Bachelors Degree in 1978. In June 1979, completed the requirements for a Master of Science Degree in Agricultural Education.

Professional Experience: Student taught at Box Elder High School in Brigham City, Utah in 1978 for three months.