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A STUDY TO COMPARE IQ SCORES OF SELECTED SOUTH CAROLINA HIGH SCHOOL FRESHMEN ENROLLED IN VOCATIONAL AGRICULTURE WITH THOSE NOT ENROLLED.

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THE AVERAGE IQ SCORES OF DIFFERENT STUDENT GROUPS WERE COMPARED--HIGH SCHOOL FRESHMEN ENROLLED IN VOCATIONAL AGRICULTURE AND THOSE NOT ENROLLED, AGRICULTURE I AND AGRICULTURE II STUDENTS, AND RURAL AND NONRURAL STUDENTS. DATA WERE COLLECTED FROM 18 OF 24 RANDOMLY SELECTED HIGH SCHOOLS WITH A FOUR-SECTION QUESTIONNAIRE ADMINISTERED BY THE VOCATIONAL AGRICULTURE TEACHER. THE AVERAGE IQ SCORES OF STUDENTS ENROLLED IN VOCATIONAL AGRICULTURE WERE SIGNIFICANTLY LOWER THAN SCORES OF THOSE NOT ENROLLED ON THE CALIFORNIA MENTAL MATURITY TEST AND THE SRA PRIMARY ABILITY TEST BUT NOT ON THE OTIS TEST OR HENMON NELSON TEST OF MENTAL ABILITY. LITTLE OR NO DIFFERENCE WAS FOUND BETWEEN AVERAGE IQ SCORES OF AGRICULTURE I AND AGRICULTURE II STUDENTS AND RURAL AND NONRURAL STUDENTS. SINCE MORE THAN ONE TYPE OF TEST WAS GIVEN, IT IS IMPOSSIBLE TO MAKE A STATISTICALLY TRUE STATEMENT ABOUT AGRICULTURE CLASSES BEING THE "DUMPING GROUNDS" FOR GUIDANCE COUNSELORS. HOWEVER, IN 12 OF THE 18 SCHOOLS, THE AVERAGE IQ OF THE AGRICULTURE I STUDENTS WAS FROM 0.3 TO 20.3 POINTS LOWER THAN THAT OF THE MALE FRESHMAN. (JM)

A STUDY TO COMPARE IQ SCORES OF SELECTED SOUTH CAROLINA HIGH SCHOOL FRESHMEN ENROLLED IN VOCATIONAL AGRICULTURE WITH THOSE NOT ENROLLED

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A Term Report Submitted in Partial Fulfillment
of the Requirements in
Agricultural Education 504 -- Special Problems

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INTRODUCTION

Statement of the Problem

It is generally recognized that many job opportunities for agriculturally trained personnel exists at all levels of educational attainment. These opportunities exist because of the pronounced shortage of properly trained personnel.

Some have expressed the opinion that high school vocational agriculture has not enrolled its proportionate share of the high ability students. In turn, these conditions impede or prohibit our efforts to provide the personnel needed in the agriculture industry. This study was initiated in an attempt to compare the average IQ scores of high school freshmen enrolled in vocational agriculture with those not enrolled. An attempt was also made to compare the average IQ scores of students enrolled in Agriculture I with those enrolled in Agriculture II. A comparison was also made of the average IQ scores of rural and non-rural students enrolled in Agriculture I.

Significance of the Problem

The intent of this research was to reveal facts to determine if students enrolled in vocational agriculture in South Carolina high schools have the same average mental ability as those not enrolled in vocational agriculture. This information would be a valuable asset to vocational agriculture teachers in developing an instructional program for their students. This information could be used in setting up a counseling program for vocational agriculture students.

Assumptions and Limitations

In making this study the author has assumed that IQ is a valid measurement of a student's ability. It is also assumed that the six questionnaires not returned are representative of the sample. This study is limited to a random sample of the White High Schools in South Carolina offering vocational agriculture. Several types of IQ test were used throughout the state, therefore it was necessary to run a statistical analysis on the data from each type of test.

Definitions

Intelligence Quotient (IQ) - A measure of potential rate of growth up to 16 years of age, expressed as the ratio of mental age to chronological age. The formula is:

$$IQ = \frac{MA}{CA} \times 100$$

Random Sample - A sample presumed to be representative of the total population.

REVIEW OF LITERATURE

McRill[1] undertook a study to determine the mental ability and scholastic achievement of freshmen vocational agriculture students in Shelby County, Ohio. He found that the median IQ for the agriculture students was 101.3, and the median IQ for all students was 101.95; therefore, there was very little difference between these groups. The data also indicated there would be no significant difference in the IQ distribution for agriculture students compared with that of other members of their class, and with the normal expectancy of all students on the California Test of Mental Maturity. He concluded that vocational agriculture in Shelby County, Ohio had not been a so-called "dumping ground" of slow students. On the contrary, the program received a nearly normal distribution of all students with a few more advanced students than slow ones.

Warner[2] conducted a study to determine the intellectual abilities of freshmen students enrolled in vocational agriculture in Wood County, Ohio. The mean IQ of the vocational agriculture students was 100.4 as compared to 100.38 for the Wood County, Ohio freshmen and 100 for the national norm. This study showed that the freshmen in vocational agriculture were equal to or just a little above the average in capacity for learning as indicated by IQ.

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[1]McRill, Arlen D. The Mental Ability and Scholastic Achievement of Freshmen Vocational Agriculture Students in Shelby County, Ohio. The Ohio State University, 1961.

[2]Warner, Hildred H. The Intellectual Abilities of Freshmen Students Enrolled in Vocational Agriculture in Wood County, Ohio. The Ohio State University, 1962.

DESIGN OF THE STUDY

Source of Data

The source of data was a questionnaire type inquiry form which was sent to 24 vocational agriculture teachers picked at random throughout South Carolina. This approach was used because the agriculture teacher could obtain the data efficiently and in a reasonable amount of time. Cost of obtaining the data was held to a minimum.

Method of Obtaining Data

A random sample of 24 South Carolina High Schools offering vocational agriculture were selected. The instrument was then distributed and explained to the District Supervisors of Agricultural Education. The supervisor then met with the agriculture teacher from the selected school. The teacher, in consultation with guidance personnel of his school, furnished the needed information. This information was then mailed directly to the author. Of the 24 questionnaires distributed, 18 were returned. The data were then statistically analyzed.

Description of the Questionnaire

The instrument was divided into four parts. Part one was designed to determine the type and series of IQ test given to the freshman class of 1963-64. Part two was designed to determine the IQ of all male students in the freshman class of 1963-1964, their residence status, enrollment in Agriculture I in 1963-1964, and enrollment in Agriculture II in 1964-1965. Part three was to repeat the procedure used in part two to include those 1963-1964 Agriculture I students not included in the freshman enrollment. Part four was to repeat procedures used in part

two and three to include students enrolled in Agriculture II, 1964-1965 not included in Agriculture I, 1963-1964.

SOME FACTS CONCERNING THE IQ SCORES OF STUDENTS ENROLLED IN VOCATIONAL AGRICULTURE AND THOSE NOT ENROLLED

In order to facilitate the analysis of these data, the author divided the questionnaires into groups according to the type of IQ test given. This was necessary before a statistical analysis of the data could be made.

Following a preliminary examination of the completed questionnaires, the decision was made to compare the IQ scores of three distinct groups. Group one included a comparison of the average IQ scores of all male students in the freshman class of 1963-1964 and those from this class enrolled in Agriculture I. Group two included a comparison of the average IQ scores of the students in Agriculture I 1963-1964 and the students from this group enrolled in Agriculture II 1964-1965. Group three included a comparison of the IQ scores of the rural students and the non-rural students. The three groups were analyzed statistically where applicable, according to the type of IQ test given; Otis, California Mental Maturity, the Henmon Nelson Test of Mental Ability, and the SRA.

Table I shows the average IQ scores of all male freshmen and those students enrolled in Agriculture I 1963-1964, as measured by the California test of Mental Maturity. It can be seen that the average IQ of the male freshmen students is 99.3, whereas the average IQ of the students enrolled in Agriculture I is 90.4. The difference in the average IQ scores of 99.3 and 90.4 indicates a statistical difference at the .05 level of significance. This data indicates that the mental ability of the students enrolled in Agriculture I is lower than the average mental ability of their class.

TABLE I

A COMPARISON OF THE AVERAGE IQ SCORES OF MALE FRESHMEN STUDENTS 1963-1964 AND THOSE ENROLLED IN AGRICULTURE I, 1963-1964 (CALIFORNIA TEST OF MENTAL MATURITY)

School	MALE FRESHMEN		AGRICULTURE I STUDENTS	
	Average IQ	Number of Students	Average* IQ	Number of Students
1	99.5	108	95.6	31
2	95.4	21	88.1	7
3	96.6	42	90.6	15
4	102.6	41	83.3	6
5	103.3	24	102.5	7
6	96.9	19	82.3	9
Average	99.3		90.4	

* California Test of Mental Maturity
  Calculated T=2.88
  T(.05) = 2.57 (Significant of the 5% level of confidence)

Table II shows the same comparison as Table I for schools using the Otis Test. The average IQ of the male freshmen students is 99.1, whereas the average IQ of the students enrolled in Agriculture I is 96.6. The difference in the average IQ scores of 99.1 and 96.6 indicates no statistical difference at the .05 level of significance. These data indicates that there is very little difference between these groups. Therefore the information indicates that the agriculture students represent an average sampling of the male freshmen in the schools included.

TABLE II

A COMPARISON OF THE AVERAGE IQ SCORES OF MALE FRESHMEN STUDENTS 1963-1964 AND THOSE ENROLLED IN AGRICULTURE I, 1963-1964 (OTIS TEST)

School	MALE FRESHMEN		AGRICULTURE I STUDENTS	
	Average IQ	Number of Students	Average* IQ	Number of Students
1	95.0	68	93.5	38
2	97.8	56	94.6	13
3	95.5	64	98.0	38
4	100.9	84	95.1	20
5	97.4	37	97.9	19
6	91.0	17	91.0	15
7	112.4	14	103.2	6
8	100.8	123	92.3	25
9	94.3	10	94.0	9
10	106.1	25	106.1	10
Average	99.1		96.6	

* Otis Test
Calculated T=2.011
T(.05) = 2.262 (Non-Significant at the 5% level of confidence)

Table III shows the same comparison as Tables I and II for schools using the SRA Primary Ability Test.

TABLE III

A COMPARISON OF THE AVERAGE IQ SCORES OF MALE FRESHMEN STUDENTS 1963-1964 AND THOSE ENROLLED IN AGRICULTURE I, 1963-1964 (SRA PRIMARY ABILITY TEST)

School	MALE FRESHMEN		AGRICULTURE I STUDENTS	
	Average IQ	Number of Students	Average* IQ	Number of Students
1	104.0	25	91.1	9

* SRA Primary Ability Test

Since only one school used this test no statistical analysis was made. However, with the median IQ of 104.0 and 91.1 respectively, it can be concluded that the IQ scores of Agriculture I students are much below the freshmen average.

Table IV shows the same comparison as Tables I, II, and III for the school using the Henmon Nelson Test of Mental Ability.

TABLE IV

A COMPARISON OF THE AVERAGE IQ SCORES OF MALE FRESHMEN STUDENTS 1963-1964 AND THOSE ENROLLED IN AGRICULTURE I, 1963-1964 (THE HENMON NELSON TEST OF MENTAL ABILITY)

School	MALE FRESHMEN		AGRICULTURE I STUDENTS	
	Average IQ	Number of Students	Average* IQ	Number of Students
1	98.6	8	95.4	7

* The Henmon Nelson Test of Mental Ability

The difference in the average IQ scores of 98.6 and 95.4 indicates that there is very little difference between these groups.

TABLE V

A COMPARISON OF THE AVERAGE IQ SCORES OF STUDENTS ENROLLED IN AGRICULTURE I, 1963-1964 AND STUDENTS ENROLLED IN AGRICULTURE II, 1964-1965

	AGRICULTURE I		AGRICULTURE II	
Type of Test	IQ	Number of Students	IQ	Number of Students
C.M.M.	90.4	75	92.0	59
Otis	96.5	193	97.5	172
Hemmon	95.4	7	95.5	7
SRA	91.1	9	91.3	9

We can see that these scores for Agriculture II are a little above the average scores for Agriculture I students. These data indicate that the students continuing from Agriculture I to Agriculture II are average for the sample.

Table VI gives the average IQ scores of rural and non-rural students enrolled in Agriculture I. Inspection of these data would indicate there is little or no difference in the average IQ scores of rural and non-rural students.

TABLE VI

A COMPARISON OF THE IQ SCORES OF RURAL AND NON-RURAL STUDENTS ENROLLED IN AGRICULTURE I, 1963-1964

Type of Test	Rural IQ	Non-Rural IQ
C.M.M.	91.1	91.6
Otis	97.1	96.9
Henmon	98.1	94.4
SRA	91.1	91.2

SUMMARY AND CONCLUSION

This study was initiated to compare the IQ scores of high school freshmen enrolled in vocational agriculture with those not enrolled. An attempt was made to determine the difference in the average IQ scores of students enrolled in Agriculture I and Agriculture II. A comparison was also made of the average IQ scores of rural and non-rural students enrolled in Agriculture I.

A questionnaire type inquiry form was utilized to obtain these data. Twenty four schools were selected at random. The instrument was sent to the District Supervisors of Agricultural Education. They met with the agriculture teachers of selected schools and explained the questionnaire. Each agriculture teacher filled in the data and returned to the author.

Prior to analyzing, the data were divided into three groups. Group one included a comparison of the average IQ scores of the male students in the freshmen class and the male freshmen students enrolled in Agriculture I, 1963-1964. Group two included a comparison of the average IQ scores of students enrolled in Agriculture I, 1963-1964 and the students from this group enrolled in Agriculture II, 1964-1965. Group III included a comparison of the IQ scores of the rural students and the non-rural students enrolled in Agriculture I, 1963-1964. The three groups were analyzed statistically, where applicable, according to the type of IQ test given.

The average IQ scores on the California Mental Maturity Test for the male freshmen were 99.3, and the average IQ scores for Agriculture I students was 90.4. These averages indicate a statistical difference at

the .05 level of significance. This data supports the belief that the agriculture class has been a "dumping ground" for the guidance counselors.

On the Otis Test the average IQ of the male freshmen was 99.1, whereas the average IQ of the students enrolled in Agriculture I was 96.6. The difference in the average IQ scores of 99.1 and 96.6 indicated no statistical difference at the .05 level of significance. Therefore, this information indicated that the agriculture students represented an average sampling of the male freshmen in the selected schools. The SRA Primary Ability Test was given in only one of the schools. However, with the average IQ of 104 and 91.1 respectively, it was concluded that the agriculture students were much below the average freshmen students. The results of the Hemmon Nelson Test of Mental Ability showed no significant difference in the average IQ of the two groups.

In the comparison of the average IQ scores of students enrolled in Agriculture I and those enrolled in Agriculture II, these data indicated very little difference in the IQ of the two groups. The average IQ of the Agriculture II students being the highest--thus indicating the high IQ students continue in Agriculture II.

An analysis of the average IQ scores for rural and non-rural students enrolled in Agriculture I indicated there was little or no difference in the abilities of rural and non-rural students.

Since more than one type test was given, it is impossible to make a statistically true statement about agriculture classes being the "dumping grounds" for guidance counselors in the entire state. However, in twelve of the eighteen completed questionnaires the average IQ of the Agriculture I students was from .3 to 20.3 points lower than the average IQ of the male freshmen.

The author suggests that further studies be made where the same type IQ test can be given to the entire sample. This would enable one to make a concrete statistical conclusion based on the representative sample.

LITERATURE CITED

1. Best, John W. Research in Education. New Jersey: Prentice-Hill Inc. 1959.

2. Buros, Oscar J. Mental Measurements Yearbook. New Jersey: The Gryphon Press. 1953.

3. McRill, Arlen D. The Mental Ability and Scholastic Achievement of Freshmen Vocational Agriculture Students in Shelby County, Ohio. Ohio: The Ohio State University, 1961.

4. Warner, Hildred H. The Intellectual Abilities of Freshmen Students Enrolled in Vocational Agriculture in Wood County, Ohio. Ohio: The Ohio State University, 1962.

APPENDIX

Data Collecting Instrument Used

A STUDY TO COMPARE IQ SCORES OF HIGH SCHOOL FRESHMEN ENROLLED IN VOCATIONAL AGRICULTURE WITH THOSE NOT ENROLLED

Introduction:

It is generally recognized that many job opportunities for agriculturally trained personnel exists at all levels of educational attainment. These opportunities exist because of the pronounced shortage of properly trained personnel.

Some have expressed the opinion that high school vocational agriculture has not been enrolling its proportionate share of the high ability students. In turn, this situation impedes or prohibits our efforts to provide the personnel needed in the agricultural industry. Whether this is true in our state is really not known. However, we would like to have more information than is presently available. While the IQ test is only one measuring device, it is an indicator. In many schools it is, unfortunately, the only indicator available. Therefore, we would appreciate your furnishing us with certain information on students concerning IQ tests and scores.

Selection of Schools:

Using a random sample technique only 24 schools were selected. Therefore, it is imperative that we have 24 participants. If for some reason this information is not available or you do not want to participate, please return the information immediately so that an alternate school can be selected.

Procedure:

In order to assist you, the following is suggested:

Part I - page 1

1. Determine the type and series of IQ test given to the freshman class of 1963-1964 and fill in the appropriate blanks.

Part II - page 2

2. List the IQ scores, in numerical sequence, as they appear on your records, of all male students in the freshman class of 1963-1964 and complete the remainder of the form. Please do not use names.

Part III - page 5

3. Repeat procedure used in step 2 above to include those agriculture students enrolled in Agriculture I, 1963-1964 NOT included in freshman enrollment (i.e. enrolled in Agriculture I but classified as a sophomore, junior or senior).

Part IV - page 6

4. Repeat steps 2 and 3 above to include students enrolled in Agriculture II, 1964-1965 NOT included in Agriculture I, 1963-1964 (i.e. presently enrolled in Agriculture II but not enrolled in Agriculture I last year;.

PART I

Check the Type and Indicate the Series of the IQ Test Used in Your School.

(a) California Mental Maturity _____, Series _____

(b) Otis _____, Series _____

(c) Thorndike _____, Series _____

(d) SRA Primary Ability _____, Series _____

(e) Other (Name and Series) _____

PART II

Please List the IQ and Check Classification of all Male Students in the Freshman Class of 1963-1964.

No. of Students in Numerical Sequence on your Records	IQ	Rural		Non-Rural	Enrolled in Ag I 1963-64	Enrolled in Ag II 1964-65
		Farm	Non-Farm			
1						
2						
3						
4						
5						
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PART III

Students Enrolled in Ag. I, 1963-1964 Who Were Not Included in Freshman Enrollment.

Number of Students in Numerical Sequence on your Records	IQ	Rural	
		Farm	Non-Farm
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

PART IV

Students Enrolled in Ag. II, 1964-1965 Who Were Not Freshmen Enrolled in Agriculture I, 1963-1964.

Number of Students in Numerical Sequence on your Records	IQ	Rural		Non-Farm
		Farm	Non-Farm	
1				
2				
3				
4				
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