THE IMPACT OF AGRICULTURAL INSTRUCTION UPON ATTITUDES AND VOCATIONAL PREFERENCES OF SECONDARY SCHOOL STUDENTS IN KENYA

by
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APPROVAL SHEET

Title of Thesis: The Impact of Agricultural Instruction Upon Attitudes and Vocational Preferences of Secondary School Students in Kenya

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ABSTRACT

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Jay Martin Reid, Master of Science, 1969

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The purpose of this study was two-fold: to determine (1) the extent of attitude change among secondary school students in Kenya following a course of instruction in the principles and practices of agriculture, and (2) the extent to which students who select agriculture as a vocation evidence interest in agricultural related activities.

Data were collected from among seven schools participating in a contract between the Government of Kenya and the United States Agency for International Development through which a four-year program of agricultural education had been initiated in the secondary school system. Data were also taken in a control school which did not offer agriculture. Two instruments, an attitude inventory and a vocational preference scale, were used in collecting the data from the total population participating in the program. The data were then analyzed by a t-test of significance between the four levels in the total contract schools and the

form levels of the total contract schools compared with a control school.

The major findings were:

1. There was no significant difference in attitude change between Form I and Form II students or between Form I and Form IV students in the contract schools. (A mean score of 2.38 was observed for the students of Form I compared to mean scores of 2.34 for students of Form II and 2.36 for students of Form IV.)

2. There was a significant difference in attitude between Form I and Form III students in the contract schools.

3. When contract schools were compared with the control school, no differences were found between Forms II and between Forms IV. A significant difference was found between Forms III, however, due to a significant difference between Forms I, it was not possible to draw conclusions.

4. There was greater tendency among students who selected agriculture as a vocation to choose agriculturally related activities from a preference scale after taking a course in the principles and practices of agriculture. There was an increase in the selection of agriculturally related activities of 1.1 activities of Form IV students over Form I students.

ACKNOWLEDGEMENTS

The author wishes to express appreciation to the Minister of Education and the Office of the President of Kenya for granting approval to conduct this study.

Special thanks is extended to Dr. V. R. Cardozier for his patience and wise counsel throughout this study and to the agricultural education staff who gave assistance and direction as requested.

To my wife and children I owe a special debt of gratitude for unselfishly giving up husband and father to the task of evaluating a special segment of his work.

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CHAPTER I

BACKGROUND OF STUDY

Approximately 90 per cent of the population of Kenya are engaged in or are economically dependent upon agriculture as a way of life. It is, therefore, paramount to a strong growing reform that the young citizens of Kenya develop favorable attitudes toward agriculture as a way of life. To effect this favorable attitude and initiate a change in the concept of agriculture in the Kenyan culture, it is necessary to structure a program of education consisting of definite goals and a course outline that will offer a means for the accomplishment of these goals. A primary aim of such a program would be to train the indigenous people in the basic crop, livestock, managerial and mechanical practices that would enable them to develop the agricultural resources of Kenya. Such a program must integrate into the present system of secondary education. It should be designed to implement approved practices of agricultural production in all geographical regions of Kenya and be patterned to fit the overall program that is to furnish the manpower necessary to bring about the change in African agriculture.

Statement of Problem

The purpose of this study was to determine if a course in the principles and practices of agriculture offered in the secondary schools of Kenya would result in more favorable attitudes toward agriculture as a way of life.

Need for the Study

In the absence of prior studies, a study of this nature could serve as a basis for program planning in agricultural education in the secondary schools of Kenya, based upon present aspirations and needs. For many students in the system, secondary education is terminal. A program of agricultural education could provide these students with applicable skills necessary to enter into the work of the farm, a value very essential to Kenya as a developing country in an agricultural economy. This concept fits well into the present governmental policy of Africanization of Kenya's economy.

The study will provide useful guidelines upon which to structure program planning in the neighboring countries of Uganda and Tanzania who are planning to initiate similar programs in cooperation with Kenya. The study can provide a base for future evaluation of the agricultural education program (secondary) and a basis for redirecting the efforts of personnel involved in

program development throughout East Africa, including the present teacher training program upon which the program is to be extended. The study could assist other developing countries in initiating programs in agricultural education.

Objectives of Study

The following objectives are primary in determining the role being played by agricultural instruction in the secondary educational system of Kenya:

1. To determine if there is a difference in attitudes toward agriculture between Form I and Form IV students studying agriculture.
    a. To determine if there is a difference in attitudes toward agriculture:
        (1) between Form I and Form II students
        (2) between Form II and Form III students
        (3) between Form III and Form IV students
    b. To determine if there is significant difference in the change expressed between the Forms in the experimental schools and those of the control school in Forms I through IV.
2. To determine the extent to which the occupational activities in which students wish to participate

agree with their stated vocational preference for agriculture and whether the degree of agreement changes after taking courses in the principles and practices of agriculture.

Hypotheses

The central thesis is: students enrolled in courses in the principles and practices of agriculture in the secondary schools of Kenya develop more positive attitudes toward agriculture as a way of life.

To be more specific:

1. Changes in expressed attitude toward agricultural endeavor occur following instruction in a course of Principles and Practices of Agriculture being offered in selected secondary schools of Kenya.
2. There is greater congruence between occupational choice and occupational activity interest among students who choose agriculture as a vocation and have taken a course in the principles and practices of agriculture.

Method of Research

It would have been preferable to administer the attitude and vocational preference scales used in this research to the same class each year as they progressed

through the curriculum of agriculture. Since time was limited, it was assumed that the students of each school in Forms I, II, III and IV were alike when each was in Form I. The survey instruments were administered in each of the schools concerned in the study at about the same time.

Eight secondary schools were used in this study. Six were project schools operated under the terms of a USAID/GOK contract. The seventh school was the original pilot school upon which the pilot program was structured. The eighth school was a control school having no connection with the agricultural education project.

A survey of all students in the six contract schools and the original pilot school was made at the beginning of Form I, all students in Form II and all students who had elected agriculture in Forms III and IV. One section of each form was surveyed in the control school. The surveys were designed to:

1. measure attitudes toward agriculture as a way of life, and
2. measure student's ability to select activities relating to his stated vocational choice.

Instrumentation

Two instruments were used to collect data:

Survey of attitude scale. The instrument (see Appendix A) consists of seventy statements of commonly held

and expressed attitudes by the native population of Kenya. The statements were compiled from expressions of general attitudes voiced freely in conversation by the Africans. Questions concerning the status of agriculture as a way of life compared with other vocations, questions concerning government's responsibility to the people in terms of land reforms, questions concerning the role of education in agriculture and general questions concerning a person's orientation toward agriculture were asked informally of a general cross-section of the people of Kenya. Opinions were obtained from students, teachers, European farmers and agriculture officers. Expatriate personnel, who had the responsibility of training the African in agrarian ways, were surveyed. African small plot holders, as well as the large scale farmers, were surveyed and freely expressed their opinions toward agriculture as a way of life.

On the basis of this informal survey, the author formalized a lengthy list of attitude statements most commonly expressed by these people. The list was then presented to the following people who, as members of the West Virginia University International Program's vocational agriculture contract in Kenya, and Ministry of Agriculture counterparts, were asked to select those attitude statements felt to be most common among the native population. A final list of fifty statements was found to be acceptable by the panel of judges made up of the following persons:

Mr. Robert Maxwell, Associate Professor, Agriculture, West Virginia University

Mr. Thomas Kajer, Instructor, Agriculture, West Virginia University

Mr. Lenrod Blowe, Instructor, Agriculture, West Virginia University

Mr. Robert Burns, Instructor, Agriculture, West Virginia University

Mr. Roy Dick, Instructor, Agriculture, West Virginia University

Mr. William Lindly, Instructor, Agriculture, West Virginia University

Mr. Joel Ngaruiya, Assistant Agriculture Officer, Republic of Kenya

Mr. John Onyango, Assistant Agriculture Officer, Republic of Kenya

Mr. Fred Wawire, Assistant Agriculture Officer, Republic of Kenya

Mr. Joseph Muriungi, Assistant Agriculture Officer, Republic of Kenya

Each statement in the final list was presented independently to group consensus as an expression of attitude. Once agreement was obtained by all members of the panel, the statement was structured for syntax by the panel. From the final list, twenty statements were chosen to be rephrased from a positive expression of the attitude to a negative expression. The resulting instrument was comprised of seventy statements believed to be those most commonly held and expressed by the majority of the African population toward agriculture. A scale value of one (1) to five (5) was assigned each statement according to the following:

1. A check in the one (1) position indicates a strong agreement with the statement.
2. A check in the two (2) position indicates agreement, but agreement with reservations about the statement.
3. A check in the three (3) position indicates neither agreement nor disagreement with the statement.
4. A check in the four (4) position indicates disagreement, but disagreement with reservations about the statement.
5. A check in the five (5) position indicates strong feelings of disagreement about the statement.

Vocational preference survey scale. This instrument (see Appendix B) was compiled from a list of activities submitted by the following authorities, recognized by license or position in each of their respective fields.

Agriculture--Mr. John Woods, Field Officer and Director, Kenya Farmer Association

Education--Mr. James Kamongi, Education Officer and Headmaster of Njoro School, Ministry of Education, Kenya

Engineering--Mr. John Wagner, Assistant Professor, Agricultural Engineering, Egerton College, Kenya

Law--Mr. Ramesh Varei, Attorney at Law, Republic of Kenya

Medicine--Mr. Veed Nagpal, Doctor of Medicine, Republic of Kenya

Theology--Mr. Ian Patterson, Minister, Presbyterian Church, East Africa

Sales--Mr. Evanson Murethi, Sales Manager, Rift Valley Province, Shell Oil Company of East Africa

Each authority was asked to compile a list of twenty-five basic activities that he performed in meeting the responsibility of his position. From this list, the panel of judges, as listed previously, selected activities to be paired with those in each of the other areas as follows:

1. An activity from the area of education was paired with an activity from the area of medicine, then an educational activity with an agricultural activity, educational activity with an engineering activity, educational activity with a law activity, educational activity with a theological activity, and educational activity with a sales activity.
2. An activity from the area of medicine was paired with an activity from the area of education, then an activity from the area of medicine with an activity from the area of agriculture, and so on, relating each area of vocational interest in two sets of paired activities.

The statements were paired in an "I would rather" style with the selection made possible between one activity reflecting the responsibility of each area paired with another. Forty-two pairs with each area contributing twelve different activities of responsibility were used in the final survey.

Data Collection

Permission to survey the school populations in the selected areas was granted by the Ministry of Education. The instructors and agricultural officers in each of the contract schools were called together for instructions in administering the survey instruments. It was felt that there would be comprehension differences between the Forms within a school as well as between the schools included in the survey. To compensate for this, all questions raised by the students seeking clarification of the issue involved in the statement were to be answered. Synonymizing was encouraged, since English level comprehension varied so greatly between a Form I level student and a Form IV level student. Students were to be encouraged to complete all items on both survey forms and were to be given as much time to complete the forms as they needed. Each school was to administer the survey forms during the second term of school, after the students had returned and "settled in" and they were to be completed by June 1, allowing about one month for surveying. The teachers were encouraged to administer the surveys at one sitting, by Form, in any order that fit the school schedule and to arrange this schedule so that all Forms could be surveyed on the same day. The teachers administering the surveys were asked to stress to their students that answers were neither right nor wrong, and that the survey had nothing to

do with their placement or selection for higher education. (Secondary school students in Kenya are deeply concerned about selection for the limited number of higher education opportunities. If it was thought by the student that there was a relationship between the survey and placement opportunity, the student would tend to give all the answers he thought you might be looking for. This might or might not be representative of his real opinion.) The students were told that the responses in no way would reflect upon them as individuals and that the cumulative responses would possibly be used in evaluating the program of secondary agricultural education in Kenya.

The survey was administered in the control school under the same conditions as prevailed at the contract schools. One principal difference was involved: rather than do the entire school population of Form Is through IV, the section numbers of each Form were put into a hat and one section was drawn from each Form to be representative of the school's population. In no case did a Form section fall below twenty cases. Administration of the survey in the control school was performed by the author.

CHAPTER II

EDUCATIONAL DEVELOPMENT

Educational development in Kenya has followed three separate channels and occurred in three distinct periods of time. In the first case, the first population to be affected was the native population; second was the Indian population, with the education of the Europeans coming last.

In this study, we shall concern ourselves with the education channel of the African and the development as it occurred in the three periods of time.

The first period, somewhat gradual and spasmodic, was characterized by missionary endeavor in what was literally "Dark Africa." They were engaged in both evangelism and education. The first mission school was established in East Africa by Dr. Ludwig Kraft. After being expelled from Ethiopia in 1843, Dr. Kraft sailed from Aden to begin work in East Africa. His first two years were spent in the study of Swahili, the lingua franca on the coast. This work prepared the way for all subsequent missionaries and educationists. Kraft's "Travels and Researches," published in 1860, served as the inspiration to the United Methodists, one of the first group efforts in education in East Africa.

The history of the early days of missionary effort

is one of constant struggle. At first the people had been solemn, suspicious, often greedy and more often actively obstructive, resulting in death of the missionaries. This hostility probably was due to the mission's stand on slavery, as they would generally harbor runaway slaves.

The effect of the early schools can be gleened from contemporary records. Sir Charles Elliot in 1904 stated "The Masai have by no means shown themselves amiable to missionary influence, but a certain number have learned to read and write."[1] Again he records "...That his Turkana vocabulary and stories were obtained for him by a native of the mission station at Tareta who had learned to write in the mission and had spent some months among the Turkana."[2]

From 1880 through to 1900 many developments led to an expanding missionary effort. Chartered companies were formed in England and expositions moved to open up the hinderlands. Missionaries rode their coattails. The Church Missionary Society, Christian Industrial Mission, The Roman Catholics, African Inland Mission and The Seventh Day Adventists spread out through Kenya in all directions. An appeal to America brought out two men,

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[1]Annual Report, Education Department, Colony and Protectorate of Kenya, 1930.

[2]Ibid.

Johnstone and Albert, along with some blackboards and a few seats.

By 1900 the railway had reached Nairobi, practically coincident to the expanded missionary development in Kenya and the second stage of educational development. Many of the most prestigious schools of today made their debut during this period. The technical school at Kabete, Kangaru at Embu, Museno Teachers Training Center and Kaimosi originated between 1900 and 1910, and the era was characterized by the rapid development of missionary schools in the main, independent of government.

The third stage of development was reached in 1911 when the government began to take direct interest in the work of the missions. Schools were visited by government officers and a system of grants was initiated whereby assistance was given to purchase tools for industrial work. A grant of £5 per capita was given in respect to those pupils who passed an examination given under the direction of public works, medical or other departments of government. Later this system was changed to granting funds on the basis of inspection of the school rather than on the basis of the results.

In 1924 the first education ordinance was passed and paved the way for the opening of The Native Industrial Training Depot.

> The development of industrial training is held in some quarters to be unduly emphasized. It is

> possible that there is or has been some ground for this opinion, but the demand was there and it was right to attempt to meet it. On the other hand, the general education of the natives has not been and is not being neglected. This is shown by the general improvement of the standard of the apprentices themselves.[3]

This attitude, which influenced the policy of the Educational Ordinance of 1924, was probably based upon the work of Dr. Booker T. Washington entitled Working With The Hands. Its rationale stating that education through industry is the only right system of education can be readily adapted to the African in Kenya in his present state of development. It is interesting to note from the reports of the education officers of this period the basic philosophy that influenced the policy.

> Much has been spoken and written about the need for teaching the native the dignity of labour, for teaching him to work and for leading him to increase his wants. The first expression is often the slogan of the Whiteman who wants a native to work for him, nor can he be blamed for doing so, but the real cause of these utterances is usually an economic cause. Education can be guided by both economic and social aim but its function is development of human facilities and is primarily on psychological grounds that a system of education should be approved by educational experts. The mentality of the African is undeveloped and it is universally admitted that handicrafts and manual training are especially valuable in developing the motor centers of the brain...Secondly, another common expression in educational theory is that children should learn to do by doing or let thought develop naturally out of action...The pupils pleasure in the work of his own hands and joy in creation and construction. Their instructor

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[3] Ibid.

> reports a remarkable improvement in keenness, discipline, observation, self-reliance, initiative and general intelligence and attributed it without hesitation to the increase in manual training.[4]

Another interesting observation appears during this same reporting period.

> One thing however has been note worthy this year. That the pressure of learning, especially in those going forward with higher education, has already adversely affected the health of some. Several boys have been treated in the hospital just as they were on the verge of a nervous breakdown owing to the keenness of intellectual work...In my opinion, it is imperative that each school of any size amongst the natives should have side by side an efficient hospital, especially when few natives are able to remain longer than six months without requiring some medical attention.[5]

In 1926 the Alliance High School was established. Even today this school is recognized as the training institution of Kenya's leadership. Most of the secondary system schools of today result in the policy established in the educational ordinances of 1931 and 1934 and, more particularly, The Education Ordinance of 1952. This Act specifically charges the Minister of Education with the promotion of education and the progressive development of schools. It empowers him to use public funds to establish schools and to make "grants in aid" to "Board of Governors" run schools. Practically all secondary

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[4] Annual Report, Education Department, Colony and Protectorate of Kenya, 1924.

[5] Ibid.

schools began as primary schools to which higher classes have been added one by one, and in some cases, teacher training classes are initiated as well.

In 1940 the first African school candidates, seven in number, passed The Cambridge School Certificate "O" level examinations. In 1950, sixty-three African boys passed The Cambridge School Certificate. No girls had reached this level. However, two separate secondary schools had been established. During this period, the "Ten Year Plan" for the development of African education was drafted (1947). The plan, calling for the expansion of educational facilities and greater participation by government, could not be implemented without a complete revision of the entire system of financing education. In 1949 the Beecher Committee was appointed to draft the framework of the present day educational system. One of the recommendations of the Beecher Committee was that agriculture should play a large part in all teacher training and that all teachers should be in a position to teach the subject and encourage pupils in the right attitude toward agriculture.

Nineteen hundred sixty-four, the dawn of Kenya's independence from the Crown, brought forth the report from the Kenya Education Commission. Most emphasis upon education had heretofore been in academic preparation with scant recognition of the practical aspects of life. In a

review of the Commission's report, we find the beginnings of a changing philosophy toward the approach Kenya should take in the years ahead.

> The difficulty in Kenya stems from a popular underevaluation of the manual areas as an element in education and in life...What we now need to realize is that a feeling for precision is a necessity for life in the modern world and that the lack of it is a barrier to enjoying that life...We believe that the right preparation in the secondary schools lies within the basic sciences particularly physics, chemistry, biology and mathematics. Agricultural science is offered in some schools as an examination subject...and The Syndicate has recently approved a syllabus in Agricultural Principles and Practices developed at Chavakali School in the Kakamega District. These courses in addition to the basic sciences may prove to be a valuable preparation for further studies in agriculture. We believe that they can also help to provide a practical insight into agricultural processes for those who have no intention of entering agriculture and we emphasize the importance of a spread of this kind of knowledge generally among the educated sections of the Kenya population. We hope that many more secondary schools throughout Kenya will find it possible to offer agriculture as a subject in the curriculum.[6]

In this period of transition, as the African began to take the reins of his destiny, the educational system began to reflect these new attitudes. In the past, particularly in the primary schools, agriculture had become a disagreeable word associated with punishment and tedious chores. The school garden had been a place where substandard practices of agricultural production were practiced--where student

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[6]Kenya Education Commission Report, Part I, Government Printers, Government of Kenya, December 12, 1964.

efforts at production often ended on the Headmaster's table. Agriculture was synonomous with contempt. However, if Kenya was to orient toward agriculture as the principle industry, then a break with the past was needed, and new attitudes toward agriculture as a way of life had to be instilled. To accomplish this end, the Ministry of Education requested of the United States Agency of International Development assistance in preparing a course in the principles and practices of agriculture to be initiated into the framework of secondary education.

CHAPTER III

THE PILOT PROGRAM

"To a rolling, bush, equatorial plateau inland from the eastern shore of Lake Victoria came a small band of midwestern Quakers in 1902...Little did they realize what they were starting."[1] This mission was to be the foundation of the present program of agricultural education in the secondary schools of Kenya.

Early in 1956-1957, as Kenya was emerging from the tension of the MauMau uprising, everyone became aware of the need for expanded educational facilities and opportunities for the African. The young Kenyan needed a practical dimension added to the well-established, traditional academic program. If he was to cope with the increasing economic and political demands independence would bring, he had to be educated for it.

At this time a general feeling of acceptance was developing among the British officials in the Ministry of Education toward a possible contribution the more practical American education might make to this task. In this setting, representatives of the Quaker Mission in Kenya, the International Cooperation Administration and Earlham

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[1] Educational Assistance in Kenya, Final report to the Agency for International Development, Earlham College, 1959-1964.

College in Iowa began discussions toward developing a three-phase proposal involving teacher training, the establishment of a secondary school, and the development of a basic adult literary program.

The proposal met with many delays. Kenya was still a Crown Colony. Thus, there was a question in Washington of how much assistance the U. S. Government could offer the project. Collecting taxes from the local people (perhaps the easiest obstacle to overcome), staffing and construction were among the problems that had to be worked out.

Finally in 1959, primarily due to the initiative of the local population who had collected some 80,000 shillings and a demand from them that a school be started, the Chavakali School was opened with two teachers and some thirty students.

At the beginning of the year 1960 agreements had been reached. The contracts were drawn up and signed with slight modifications from the original project idea. "The idea of adult education programs was quietly dropped and criticisms by I.C.A. officials on the art and cultural dimension caused it to be replaced by a vocational agricultural program."[2]

Thus, in early 1960 through a contract with I.C.A.

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[2] Ibid.

(International Cooperation Association) and Earlham College and the Government of Kenya, a program patterned after the American vocational agriculture programs was initiated in the secondary school at Chavakali. To develop this program, Earlham College had recruited an energetic, young Iowa vocational agriculture teacher and farmer named Robert Maxwell. His was not an easy task. The traditional cultural patterns so common in Kenya required that young men going to secondary school study and prepare for a clerkship in the capital city of Nairobi. Work on the farm, at best, was the responsibility of women. Even the few students who could see potential careers in agriculture had difficulty in assigning the study of agriculture equivalent academic status. There was little general appreciation of the significance of agriculture to the future economic development of Kenya.

Robert Maxwell tackled this task with the intent of changing this pattern. He visited the home shamba (small farm plot) and the agricultural officers. He took field trips to good African and European farms in the area and established good rapport between the Ministries of Agriculture and Education toward this program. His greatest responsibility was a promotional one.

The second stage in helping to interpret the significance of agricultural education to the nation's economy was the preparation of a syllabus in the principles

and practices of agriculture. The syllabus had to be relevant and relate the conditions and needs of the agriculture of Kenya, and it had to be "sold" to the authorities before it could gain the status of an examinable subject under the Cambridge Syndicate. The effect of Robert Maxwell's contribution is evident here:

> Eventually the whole idea caught on. Partially it was the enthusiasm of the students who became interested; partially it was the demonstration plots, which were very impressive and partially it was the persistent promotional effort of Robert Maxwell. Before long the school attracted visitors from all over East Africa who frequently came with doubt and curiosity and went away impressed and singing the praises of the experiment.[3]

Again, evidence of the contribution of Robert Maxwell in establishing the vocational agriculture concept in Kenya is recorded here:

> Gradually the interest in the community and among the boys grew. A number of the fellows began to catch the vision for agricultural improvement and the role they might play in it. They began to see agriculture as an honorable career and work with their hands in the soil as an honorable undertaking. Robert Maxwell's willingness to get out and work in the mud and dirt with the fellows undoubtedly helped to break down their former stereotypes as well as those of their parents.[4]

Students who were completing their work at the end of Form IV at Chavakali were asked to evaluate the course in agriculture and found to be consistent in their praise.

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[3] Ibid.

[4] Ibid.

They readily admitted that they had entered the program skeptically, even prejudiced against "digging in the soil." However, they grew excited to discover the wealth to be found in the soil and to realize that the major source of money for Kenya was to be found in farming. They realized that farming had to be scientific and they influenced their parents to use better methods. Most important, however, was the realization that they had discovered new opportunities for careers.

The Chavakali program had made its impact. Contracts originally designed for two years were extended. Further program implementation extended through the personalities of Robert Simkin, who replaced Robert Maxwell in 1962, and a Daniel Beane, who replaced Robert Simkin in 1964.

By this time, national interest in the scheme was so strong that the Kenya Ministry of Education of the newly independent nation invited A.I.D. (Agency of International Development, a new name given to the I.C.A.) to establish programs at five other schools in different regions. These were to be patterned after the Chavakali project except that they were to be fitted into boarding schools rather than the day school situation. The invitation met with favorable acceptance, and the contract was awarded to the West Virginia University in July of 1964 with Robert Maxwell appointed chief of party for the new program.

Expansion of Vocational Agriculture Concept

Having stood the test by trial and error and having won over the most skeptical of British educational hierarchy, the Cambridge Syndicate, a course specifically titled "The Principles and Practices of Agriculture" was approved as an examination course. The new project, a contract between A.I.D., West Virginia University, and the Government of Kenya, was begun. Five teachers were recruited by the University and given an eight-week culture and language training program. Early in September of 1964 they were enroute to begin the responsibility of organizing courses and supervising the construction of buildings, collecting materials, and orienting to the local situations. Classes were to start in January, 1965, in the selected schools. The teachers or technicians, as they were to be called, were to "engage primarily in teaching, further development of suitable and adaptable courses and to supervise counterpart teachers provided by GOK,"[5] who were to expand the program to other schools and replace the U. S. technicians within the four years following the initiation of the project.

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[5]Project agreement between A.I.D. and Government of Kenya, Project No. 615-11-620-110. Agreement No. 110-1-411, U.S.A.I.D. Project. Agricultural Education-Kenya, 1964.

The contribution of the U. S. Government provided for an initial grant of approximately one-half million dollars that was to cover the following costs of implementing the program:

1. Technical services: a two-year funding of the staff essential to the project.
2. Commodities: a small grant for demonstrative materials and supplies to initiate the program in each school.
3. Construction: a grant to each school to cover cost of constructing a suitable classroom/shop complex.
4. Specialized training: a study grant for selected African counterpart teachers to spend a year of special training in the U. S.

The Government of Kenya contribution agreed to provide or arrange for the provision of the following support for the program:

1. Suitable building cites.
2. Suitable land for demonstration purposes.
3. Housing and hard furnishings for the technicians.
4. Transportation and maintenance costs for official vehicles.
5. Recurrent costs of operating at each of the five schools.
6. Salaries of the five counterpart teacher trainees.

The Kenya Ministry of Education was given the overall responsibility of the project with the Chief of Party assigned to the Ministry for liaison between the Inspectorate, Regional Education Officers, Headmasters of the schools, and the Chief Education Officer.

All five of the selected schools were boarding schools and located, insofar as possible, in different tribal regions and provinces of Kenya, thereby providing the opportunity for demonstration under varying ecological conditions and different tribal cultures. However, since there was a fluid policy in school selection processes, there was little difference in the cultures of one school population as compared with any other. Basically the school populations in each of the five schools were the same, with only a small margin favoring the major tribe of the area. The five schools and assignments were as follows:

1. Embu--Central Province--Perry Flegel.
2. Narok--Rift Valley Province--Robert Burns.
3. Njoro--Rift Valley Province--Jay Martin Reid.
4. Kisii--Nyanza Province--Conn Price.
5. Bungoma--Western Province--Lenrod Blowe.

An additional school was added to the program a year later to ease tribal jealousy among the Luo, and a second school was placed in Nyanza Province, staffed by technician Thomas Kajer.

The vocational agriculture program in Kenya by 1966 had seven functioning departments--six A.I.D. contract schools and the original pilot program school at Chavakali.

Finding suitable counterparts proved to be a major problem. It was difficult to find the African who had an Agricultural Certificate level education with teacher training and who was willing to surrender his esteemed position as an Assistant Agricultural Officer. Although both the Ministry of Agriculture and the Ministry of Education offered comparable terms of service in Government Civil Service, officers of the Agricultural Ministry did not want to transfer into teaching. Finally, in desperation, the Ministry of Agriculture appointed six graduates from the 1966 graduating class of Egerton College to fill these positions. Thus began the internship of the local African and the phase-out of the U. S. technician.

The following year, 1967, brought in additional counterparts allowing for further implementation of the contract sending three of these men for further training in an institution in the U. S. and the extension of the program to another school at Fort Hall in the Central Province. The three selected counterparts were completing work at Oklahoma State University, to return to staff positions in the Ministry of Education by July, 1969.

Realizing that the expansion of the vocational

agriculture program was moving slowly and the four-year initial period running out, a new proposal was drafted and submitted to A.I.D. Essentially the new program made two requests:

1. Extension of the present technicians' contracts another year, through 1969.
2. Provision for a teacher trainer at Egerton College to offer courses in teacher education.

This new proposal would allow enough time to build confidence in the present counterparts to manage each department alone as well as act with some degree of competence as supervising teachers for the new class of students in teacher education at Egerton. The proposal was accepted with slight modifications, and the present program provides for the extension of technical assistance through the calendar year 1969.

A crash program has been initiated in teacher training to provide the manpower upon which to expand. The World Bank (International Development Association) has granted loan funds to the Government of Kenya for the construction of new facilities. Investigations are underway to test the feasibility of regionalizing the vocational agriculture program to include the neighboring countries of Uganda and Tanzania. The concept of educating for agriculture at the secondary level has apparently "taken." It would appear that the once held attitude, "the work of the

farm at best was the responsibility of women,"[6] has all but disappeared. Kenyans are rapidly replacing the Europeans as members of the landed gentry and Kenyans want their sons and even their daughters educated and knowledgeable in the scientific work of the farm.

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[6]Educational Assistance in Kenya, loc. cit.

CHAPTER IV

REVIEW OF RESEARCH

A logical method of reviewing literature concerning attitudes is to begin with the generalized studies and move toward the more specific studies. This review is made in an attempt to establish a theoretical base upon which the reviewer will develop the framework of this study, and it will categorize reviews of studies into five distinct areas: (1) attitudes defined, (2) theoretical basis of attitude research, (3) instrumentation, (4) general reviews of attitudinal research, and (5) attitude studies in agricultural education.

Attitudes. The concepts of attitudes were first described by researchers as a central variable. Thomas and Zananiecki defined the attitude as "an internalized counterpart of an external subject, representing the individual's subjective tendencies to act toward that object."[1]

Subsequently definitions have been formulated, each reinforcing the basic concept established earlier. The following definitions are those most often referred to by authors reviewed in this study:

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[1]W. I. Thomas and F. Zananiecki, The Polish Peasant in Europe and America (New York: Dover Publications, 1958).

1. Attitudes are orientations toward others and toward objects.
2. Attitudes are socially formed, based upon cultural experience and reveal cultural products.
3. Attitudes are selective, providing a basis for discriminating between alternate courses of action.
4. Attitudes reflect a disposition toward an activity, not a verbalization.

Hoover states that "most authorities agree that attitudes are learned predispositions to respond in an evaluative sense. They are bipolar in nature,"[2] implying that attitudes can be measured and are measured in terms of direction and intensity.

Theoretical basis of attitude research. Metcalf expresses the view that attitudes are difficult to measure. Using the work of Griffin, he relates the following:

> His theory classifies attitudes into three basic kinds: those held below the level of consciousness, those held consciously but involving only the emotions, and those held consciously possessing both cognitive and emotional content.

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[2]H. Kenneth Hoover, "Student Attitude Change in An Introductory Education Course," Journal of Educational Research, 61:7, 1968, pp. 300-303.

> The first two kinds are closed systems with which publicly accessible evidence cannot interact. The third consists both of emotional postures and beliefs that are used in their rationalization. This kind of attitude change may or may not shift as related beliefs undergo a reflective test.[3]

Griffin expresses the difficulty of attitudinal measurement in these terms:

> ...a belief structure, constructed and offered as a rationalization for a purely emotional preference does not remove the irrational basis for the attitude and therefore feelings are not automatically abolished by breaking down the beliefs used in their sanctions. For this reason it is not possible to predict or guarantee specific changes in attitude as a consequence of cognitive learning.[4]

However, in this same study Griffin indicates that although it is difficult to measure specific changes, generalized changes in attitude do take place.

> Although specific change cannot be expected, it is probable that generalized change in attitudes will take place as a consequence of reflective listing of the consciously held beliefs that function as the rational basis for certain attitudes. The character of this change cannot be measured by typical attitude scales. In fact, the kind of change is not easy to evaluate by any means.[5]

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[3] L. E. Metcalf, "Teaching Economic Concepts in the Social Studies," Illinois Counselor, 1960.

[4] A. F. Griffin, "A Philosophical Approach to the Subject Matter Preparation of Teachers of History" (unpublished doctoral dissertation, Ohio State University, 1942).

[5] Ibid.

In support of Griffin, Harris states that "we have never been able to consider adequately the problem of how, when and why people change."[6] Hoover also lends further support by saying "reliable attitude measurement has been difficult due to lack of instruments sensitive to register subtle attitude shifts."[7]

Katz, et. al.[8], studying the motivational basis of attitude changes, concludes that any attempt to modify attitudes must take into account three motivational bases: (1) the search for meaning, (2) the concept of reward and punishment, and (3) the drive for the basic psychological needs. It should be noted that processes that initiate change in the first motivational base do not necessarily function in the second or third bases and vice versa. To illustrate, the use of group norms for measuring change in the area of the reward/punishment concept would not be compatible to that of the concept of social drive.

Instrumentation. Bereiter[9] describes the difficulty in experimental methodology concerning the behavioral

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[6]Chester W. Harris, Problems in Measuring Change (Madison, Wisconsin: University of Wisconsin Press, 1963), pp. 3-20.

[7]Hoover, op. cit.

[8]Daniel Katz, Charles McClintock and Irving Sornoff, "The Motivational Basis of Attitude Change," Journal of Abnormal and Social Psychology, 49:7, 1954, pp. 115-124.

[9]C. Bereiter and M. B. Freedman, Fields of Study and the People in Them. The American College (New York: John Wiley and Sons, 1962).

sciences by illustrating three major dilemmas. One points out the radical reversals of findings that often occur when one changes from raw score data to residual change or standard score. Secondly, the unreliability-invalidity dilemma indicates that high reliability scores require low test-retest correlations and the test may not measure the same thing on the two occasions. Therefore, the change scores are meaningless. However, the meaningfulness of change scores does not depend on a test measuring the same thing on two occasions, and therefore the dilemma is a false one. The third dilemma considers measuring objective changes between scores on two occasions and subjective dimensions at the same time, whereas these subjective dimensions do not have the same underlying physical quantity. In the measurement of attitudes, it is dangerous to assume that everything is linear and that we can evaluate attitude changes effectively through linear analysis.

Kagen[10], in a study of attitude changes, raises the question of validity and reliability of instruments measuring attitude change. Riestra touches lightly upon the problem of reliability of instruments in concluding "assuming that the scores obtained by the pupils on the

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[10]Norman Kagen, "Group Procedures," Review of Educational Research, 56:2, 1966, pp. 274-287.

inventory were valid indications of their attitudes."[11] Horst[12] speaks of evaluating change with a generalized model and follows by stating numerous assumptions essential in describing its use under different sets of conditions, such as time and environment. Another authority, Webster, expresses the problem in this manner:

> The measurement of a change has always been a central problem of science...only very rudimentary methods for measuring social and psychological change are known...and social science data are practically always subject to large errors of measurement.[13]

Based upon these studies it would seem that any model for obtaining and understanding changes in people most certainly have to allow for large errors of measurement.

Attitudinal studies. There is an abundance of attitudinal research, principally measuring existing

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[11]Meguel A. Riestra and Charles E. Johnson, "Changes in Attitudes of Elementary School Pupils Toward Foreign-Speaking Peoples Resulting From the Study of a Foreign Language," Journal of Experimental Education, 33:1, 1964, pp. 65-72.

[12]Paul Horst, "Generalized Canonical Correlations and Their Applications to Experimental Data," Journal of Clinical Psychology, Monograph Supplement No. 14, 1961, pp. 331-347.

[13]H. Webster, "Reliability of the Ordering Achieved by Test," Psychological Reports, 10, 1962, pp. 59-63.

attitudes toward things and preconceived or held ideas. Research that concerns itself with attitudinal changes as a result of presentation of information remains somewhat limited. In a review of this research, several important concepts came to light concerning attitudes. The 1960 study of Breslow[14] reports evidence that many attitudes seem to be too deeply rooted to change via differing presentations of information. This was supported by the studies of the brainwashing techniques following the Korean War which related to strong human ego defenses that indicated that to be effective, education would have to influence the very roots of the individual's character.

A study of attitude relationships between socio-economic and educational viewpoints by Levine[15] indicates that attitudes should be categorized within distinct issues rather than be spread out over a diversity of issues. That is, it is hard to establish relationships between educational attitudes and status characteristics. It is better to relate educational issues with non-

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[14]Alice Brewlow, et. al., "Forces Influencing Curriculum," Review of Educational Research, 30:3, 1960, pp. 199-225.

[15]Daniel Levine, "Socio-Economic Attitudinal Correlates of Educational Viewpoints," Journal of Experimental Education, 33:3, 1965, pp. 251-261.

educational ones. Webster[16] found that expressed attitudes would vary with age, sex and the culture of groups. Jackson[17] found that the precise way in which proper attitudes contribute to learning efficiency is rather obscure but that they have both an effective and cognitive component. The latter was chiefly responsible for the development of proper attitudes. Just as the general desire to achieve affects learning, so too do the specific attitudes one holds toward the material being taught affect learning.

Vreeland[18] found that changes in values and attitudes involve both amount and direction and are directed primarily by goals. The extent of change is based upon the power influence and the effectiveness of the socializing environment. The broader the scope of involvement, the more accessible one is to the power influence and the greater is the effect on attitudinal values.

Rasinski[19] maintains that attitudes of a group are

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[16]H. Webster, "Changes in Attitudes During College," Journal of Educational Psychology, 49:3, 1958, pp. 109-117.

[17]Phillip W. Jackson and N. Strattner, "Meaningful Learning and Retention, Noncognitive Variables," Review of Educational Research, 34:5, 1964, pp. 513-529.

[18]R. Vreeland and Charles Bechwell, "Organizational Effects on Student Attitudes," Sociology of Education, 38: 3, 1965, pp. 233-250.

[19]Edwin F. Rasinski, "Changing the Attitudes of Medical School Instructors," The Journal of Educational Research, 55:3, 1961, pp. 128-131.

changed during the course of an educational program--that schools are responsible for developing certain attitudes in their students but that the acquisition of these attitudes is more often accidental than an intentional outcome.

Significant changes in attitude were found by Jacobs[20] in teacher behavior following course offerings in professional education and that age, as reported by Webster[21], was associated with significant changes of attitude.

Riestra[22] reports that more positive attitudes toward foreign speaking people result from teaching the foreign languages in the cultural settings rather than by other methods. This supports his hypothesis that more positive attitudes do result from teaching subject matter and lends support to Webster[23] and his findings regarding the cultural influence.

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[20]Elmer B. Jacobs, "An Inquiry Into the Role of Attitudes in Changing Teacher Behavior," Journal of Teacher Education, 19:4, 1968, pp. 410-413.

[21]Webster, 1958, op. cit.

[22]Riestra, op. cit.

[23]Webster, 1958. op. cit.

The studies of Miller[24], Silverman[25] and Aiken[26] are compatible in that attitude changes do result and are influenced by experience and association with the subject matter. Sewell, in determining the effect that an increased understanding of economics had upon student attitudes, used a scale instrument (agree-disagree) of 1 to 5 to test his hypothesis and found a positive correlation to the one per cent level of confidence between a student background and constructive attitudes. He relates:

> Attitudes can be measured and can be changed... There is a considerable degree of inconsistency in the beliefs of high school students...This inconsistency may be due to the low level of understanding of important principles...A measurable increase in understanding takes place as students take a course of study of these principles.[27]

Attitudinal studies in agricultural education. The principle that programs of agricultural education should be based upon the needs, aspirations and problems of the local

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[24]K. M. Miller and J. B. Biggs, "Attitude Change Through Undirected Group Discussion," Journal of Educational Psychology, 49:3, 1958, pp. 144-228.

[25]Dorothy Silverman, "An Evaluation of the Relationship Between Attitudes Toward Self and Attitudes Toward a Vocational High School," Journal of Educational Sociology, 36:9, 1963, pp. 410-418.

[26]Lewis R. Aiken and R. M. Dreger, "Attitudes and Performance in Mathematics," Journal of Educational Psychology, 52:1, 1961. pp. 25-29.

[27]Edward G. Sewell, "Effect of Classwork in Economics on Attitudes and Understandings of a Select Group of Secondary School Pupils," Journal of Educational Research, 57:5, 1963, pp. 131-136.

community is well established. Recent research studies indicate that investigations have been the motivating influence in updating, reshaping and modernizing curriculum in vocational agriculture education. A study made by The Research Committee of the Southern Region[28] regarding the attitudes of people concerning the major purpose of vocational education in agriculture found that the majority of persons interviewed indicated that the purpose should be to train for useful employment and proficiency in agricultural occupations. Espenschied[29] found that parents valued changes in their son's work habits, interest, attitudes and character which contribute to success in any occupation, not only vocational preparation, as the most important purpose of education in agriculture. Other studies, Douglas[30] and Brown[31], indicate that the

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[28]What Constitutes an Effective Program in Vocational Agriculture in a Community. Research Committee of the Southern Region, 1956, 64 pp.

[29]Roland F. Espenschied, "Major Findings of a Study of Parental Attitudes Toward Vocational Agriculture" (unpublished Doctoral dissertation, University of Illinois, Urbana, Illinois, 1961), 93 pp. In Dissertation Abstracts, 22:3467, 10, 1962.

[30]Dale B. Douglas, "An Evaluation of the Educational Objectives of Vocational Agriculture by Idaho School Administrators," Agricultural Education Magazine, 35, 1962, pp. 13-14.

[31]W. J. Brown and G. M. Love, "Dimension Project Underway at Penn State," Agricultural Education Magazine, 38, September 1965.

purpose of vocational education in agriculture should include preparation for the occupations related to farming and that the curriculum should be expanded to include training in the non-farm agricultural occupations. Based upon these attitudes, the panel of consultants to the Vocational Education Act of 1963 restated the purpose of vocational education in agriculture to include "education in any occupation involving knowledge and skills in agricultural subjects, whether or not such occupation involves work on the farm or the farm home."[32]

The approach to research in agriculture education is basically that of occupational analysis. Most studies attempt to identify the understandings, abilities and competencies needed by those employed in agriculture.

A study of prevailing attitudes that influence programs of agricultural education in a developing country was reported by Chaplin.[33] His findings include:

1. Few farmers wished their children to become farmers.
2. Farming is associated with illiteracy.
3. The manner of teaching the rural sciences reinforces numbers 1 and 2 above.

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[32]U. S. Office of Education, Vocational and Technical Education: A Review of Activities in Federally Aided Programs, Fiscal Year 1965. Washington, D. C.: Government Printing Office, 1964. 68 pp.

[33]B. H. G. Chaplin, "School Attitudes to Agriculture," West Africa Journal of Education, 5:3, 1961, pp. 94-96.

4. School gardens or farms are unsatisfactory.
5. Classroom teaching is divorced from the garden/farming practice.

Summary

In summary, attitudinal research has revealed that there is a uniformity of opinion among researchers in describing what they are attempting to measure. However, there are questions concerning the instrumentation in terms of statistical validity. There are many assumptions the researcher must be willing to accept as well as errors in measurement. Attitudes are basically ego centered and emotionally tied, and researchers should confine their approach to specific areas or issues in order to measure what they are attempting to measure.

Attitudinal studies generally concern themselves with measuring the attitudes toward an object or thing. The studies concerning attitude change as a result of instruction are limited. However, assuming that instruments are valid for measuring a particular quality, changes in values and attitudes do result, even though these changes are not always significant at the .05 level.

A review of the literature in agricultural education resulted in finding very little evidence of research concerning attitude development or change. Most were concerned with the area of occupational competencies.

Although these do not measure attitudes per se, they are reflective of the predispositions.

CHAPTER V

ANALYSIS OF DATA

The data are reported in table form, citing the number of students surveyed, mean scores, standard deviations and t values. These were obtained with measures of attitude change that took place in students enrolled in a program of instruction in the principles and practices of agriculture.

Attitudes

Total contract schools. The results of the t-test of differences in means for the total Forms within the contract schools are shown in Table 1. The data show mean scores of each Form to be numerically close and reflect positive attitudes. (A mean score below 3 is considered indicative of positive attitudes toward agriculture. A mean score above 3 indicates negative attitudes toward agriculture.) The mean score of students in Form I was 2.58 compared to a mean score of 2.34 for students in Form II. The difference (t 1.23) is not significant at the .05 level.

Form III students had a mean score of 2.27. When this was compared to the mean for Form I students, it resulted in a t value of 3.11 which is significant at the .01 level.

TABLE 1

MEANS, STANDARD DEVIATIONS AND t VALUES OF STUDENTS' ATTITUDE SCORES BY FORM LEVEL WITHIN THE CONTRACT SCHOOLS

Forms	Number of Students		Means		S.D.		t Value
	Control	Contract					
1 vs. 2	363	375	2.38	2.34	.43	.42	1.23
1 vs. 3	363	225	2.38	2.27	.43	.38	3.11**
1 vs. 4	363	207	2.38	2.36	.43	.39	.49
2 vs. 3	375	225	2.34	2.27	.42	.38	2.04*
2 vs. 4	375	207	2.34	2.36	.42	.39	.58
3 vs. 4	225	207	2.27	2.36	.38	.39	-2.43*
1 & 3 vs. 3 & 4	738	432	2.36	2.32	.44	.39	1.64

*Significant at the .05 level.
**Significant at the .01 level.

However, comparison of the means of Form I students and Form IV students (2.36) resulted in a t value of .49, not significant at the .05 level.

A second significant difference at the .05 level was found when Form II students with a mean of 2.34 were compared with Form III students with a mean of 2.27. But when Form II students and Form IV students were studied, no significant differences were found.

Students in Form III and IV were found to differ significantly but in a negative direction. Examination of data from the individual schools (Appendix C) reveal that in four out of the six schools mean scores of Form IV pupils showed less positive attitudes than those of Form III. Two of the schools whose mean scores increased in value resulted in high negative t values which are significant at the .01 and .05 levels respectively.

Special attention is directed to the significant difference between Form I and Form III; this result may possibly have been influenced by the "selection out" process carried out by some schools within the study. In two of the schools there was a "selection out" process of students at the end of Form II. However, this difference did not exist in a comparison of Form I and Form IV. It should be noted that all contract schools within the study were homogeneous in program syllabi and West Virginia University staffing. While an explanation for

the significantly lower mean score of Form IV compared to Form III is not apparent, there were unusual circumstances which may have influenced the outcome. The data collection forms were administered prior to the mock Cambridge Overseas Examination. (This is an examination in all academic subject areas taken by Form IV students in preparation for the actual Cambridge final.) Most placement opportunity either for higher scholastic ambition, government employment or employment within the private sector is based upon these examination results. A high degree of excitement and anxiety was evident among the Form IV students at this time. It should also be noted that school #4, one of the two schools with the highest negative t values, ranked first in academic performance on the Cambridge Examination. Another factor to consider in accounting for this difference is the degree of sophistication of the two school areas where high negative t values were obtained. Both schools (#4 and #5, Appendix C) are in areas of high population density and European influence.

When Form I and Form II students were grouped and compared with Form III and Form IV students there was no significant difference.

Control school vs. contract schools. A comparison of data obtained from the students of the contract schools and a random sample of students from a school selected as

a control group is presented in Table II.

In each comparison, the means of the contract schools between each Form and each Form grouping are lower, indicating that the most positive attitudes toward agriculture were held by students who were taking the program of study in agriculture.

A t-test of the differences between mean scores of the contract schools and the control school yielded a t value of 2.55 between the two groups of Form I students and is significant at the .05 level. The t value of 1.47 between the two groups of Form II students is not significant at the .05 level. A t value of 3.30 between the two groups of Form III students is significant at the .01 level while a t value of 1.79 between Form IV students is not significant at the .05 level.

By grouping the students of Form I with those of Form II and the students of Form III with those of Form IV and computing a t value of the differences in the means of the contract schools and control school. t values of 2.92 and 3.61 respectively were obtained. Both are significant at the .01 level.

Vocational Preference

The results of a comparison of data obtained by comparing the distribution of students who selected agriculture as their vocational choice and who selected

TABLE II

MEANS, STANDARD DEVIATIONS AND t VALUES OF STUDENTS' ATTITUDE SCORES BY FORM LEVEL IN CONTRACT SCHOOLS COMPARED WITH A CONTROL SCHOOL

Forms	Number of Students		Means		S.D.		t Value
	Control	Contract					
1 vs. 1	54	363	2.58	2.38	.43	.43	2.55*
2 vs. 2	59	375	2.46	2.34	.30	.42	1.47
3 vs. 3	19	225	2.57	2.27	.32	.38	3.30**
4 vs. 4	20	207	2.52	2.36	.23	.39	1.79
1 & 2 vs. 1 & 2	65	738	2.52	2.36	.37	.43	2.92**
3 & 4 vs. 3 & 4	39	432	2.54	2.31	.27	.39	3.61**

*Significant at the .05 level.
**Significant at the .01 level.

agricultural related activities from among other vocational activities by Form indicates that:

1. Thirty per cent of the students in Form I selected agriculture as a vocation compared to 42 per cent of the students in Form II, 54 per cent of the Form III students and 63 per cent of those students in Form IV. These data are shown in Table III.
2. The students in Form I selected 81 per cent of the twelve possible agriculture related activities for a total of 9.7 activities. The students in Form II selected 88 per cent of the twelve possible activities, or a total of 10.6 activities. Form III students made slight improvement in selection by choosing 89 per cent of the twelve activities or 10.7 of the total possible activities. The Form IV students selected 91 per cent of the twelve activities or 10.8 per cent of the twelve for a gain of 1.1 activities over Form 1 students.

In all but one of the possible paired selections of agriculture related activities the Form IV students showed greater gains over the Form I students. On this particular activity, Form I students showed greater gains over the other Forms.

Data showing the relationship of the percentages

of students who selected the agricultural related activities with those who attempted the selection processes are reported in Table III.

TABLE III

VOCATIONAL PREFERENCE SCALE SUMMARY

	Form 1		Form 2		Form 3		Form 4	
No. of Students	404	Per cent	382	Per cent	226	Per cent	209	Per cent
No. Selected Agriculture	122	30	159	42	121	54	151	65
Item 1 Attempted	121		157		119		150	
Correct	113	93	142	90	106	89	115	88
Item 2 Attempted	117		155		120		128	
Correct	111	95	148	96	120	100	125	98
Item 3 Attempted	115		154		121		129	
Correct	98	85	141	92	107	88	120	93
Item 4 Attempted	115		154		121		128	
Correct	92	80	135	88	107	88	112	88
Item 5 Attempted	114		153		118		129	
Correct	102	90	140	92	108	92	117	91
Item 6 Attempted	109		154		119		129	
Correct	79	73	122	79	98	82	105	81
Item 7 Attempted	111		152		120		128	
Correct	88	79	128	84	110	91	120	94
Item 8 Attempted	117		154		120		129	
Correct	109	93	146	95	114	95	129	100
Item 9 Attempted	106		147		111		125	
Correct	70	66	110	75	78	70	92	75
Item 10 Attempted	113		150		114		129	
Correct	103	91	144	96	106	93	121	94
Item 11 Attempted	106		144		115		129	
Correct	52	49	128	89	100	87	108	84
Item 12 Attempted	111		146		107		126	
Correct	92	83	122	84	95	89	111	88
Per cent of Total Activities		81		88		89		90
Average Number of Activities	9.7		10.6		10.7		10.8	

CHAPTER VI

SUMMARY AND CONCLUSIONS

This study was conducted in Kenya, East Africa, during the second school term of 1968 while the author was a part of the West Virginia University team engaged in introducing vocational agriculture in selected schools there. The central thesis of the study was that students receiving agricultural instruction would develop more positive attitudes toward agriculture and that they would be more likely to choose agriculture as a vocation.

More specifically, the main objectives of the study were:

1. To determine if there is a difference in attitudes toward agriculture between Form I and Form IV students studying agriculture. A secondary objective was to determine if differences in attitudes toward agriculture existed between Form I, Form II and Form III students respectively.
2. To determine the extent to which the occupational activities in which students wish to participate agree with their stated vocational preference for agriculture and whether the degree of agreement changes after taking courses in the principles and practices of agriculture.

The study population consisted of students in Forms I through IV in seven contract vocational agriculture program schools in Kenya and a random sample of students in Form I through IV in a control school selected by the Ministry of Education. There were 1170 students in the contract schools and 102 in the control school.

Each student included in the study was asked to respond to two instruments:

1. An attitude scale of 70 items designed to elicit students' attitudes toward agriculture and farming as a way of life, and
2. An instrument designed to determine students' vocational preferences and to check the consistency of their preferences with a selected list of activities. The respondent indicated one of the following as his choice for employment: agriculture, education, law, engineering, religion/social work, sales/clerical, and medicine. Then from a list of 42 pairs of statements of activity, the respondents selected, in each case, one of the two statements which described an activity they liked most to do. The purpose was to determine the extent to which activities chosen were congruent with the vocational preference indicated.

Data from the attitude scale were analyzed by a t-test of the differences between the means of the student

groups at each Form level in the total contract schools and a t-test of the differences between the means of the student groups at each Form level in the contract schools as compared with the control school.

Data on the vocational preference scale were analyzed by a frequency count of correct responses of the agriculture related activities of those students who selected agriculture as a vocation.

Summary of Findings

A summary of the data collected produced the following findings:

Attitude Change in Contract Schools

1. The difference between Form I and Form II students in the contract schools was not significant at the .05 level.
2. The difference between Form II and Form III students in the contract schools was significant at the .05 level.
3. The difference between Form III and Form IV students in the contract schools was significant at the .05 level but in the opposite direction.
4. The difference between Form I and Form IV students in the contract schools was not significant at the .05 level.

Attitude Changes of Control vs. Contract Schools

1. The difference between Form I students of the contract schools and Form I students of the control school was significant at the .05 level of significance.
2. The difference between Form II students of the contract schools and the Form II students of the control school was not significant at the .05 level. However, the apparent difference was in the direction of more positive attitudes.
3. The difference between Form III students of the contract schools and the Form III students of the control school was significant at the .05 level.
4. The difference between Form IV students of the contract schools and the Form IV students of the control school was not significant at the .05 level but the apparent difference was in the direction of more positive attitudes among all Forms.

Vocational Preferences

1. The percentages of students in Forms II, III and IV selecting agriculture as a vocation were greater than among Form I students.
2. The average number of agriculturally related activities selected by Form IV students

increased by 1.1 activity over selections made by Form I students.

Conclusions

Conclusions are drawn from an analysis of data in terms of the hypotheses established for the study. These hypotheses have been converted here to the null form to facilitate testing.

Hypothesis 1. Changes in expressed attitudes toward agricultural endeavors do not occur following instruction in a course of principles and practices of agriculture being offered in selected secondary schools of Kenya.

When data from the contract schools were analyzed, no significant differences were found between the Form I students and the Form II students or between the Form I students and the Form IV students. There was a significant difference found between Form I students and Form III students. In view of this contradiction, the law of parsimony suggests that the null hypothesis be accepted.

Examination of data between the contract and the control schools at the Form III level shows significant differences at the .01 level but no significant differences between the Form II level students and the Form IV level students. The significant difference at the Form III level suggests a possible basis for rejecting the null hypothesis. However, since there is a significant difference at the .05

level between means of students at the Form I level in the contract schools compared to the control school, the data from the control school do not make a useful contribution to the analysis.

Hypothesis 2. There is no difference in congruence between occupational choice and activity interest among students who choose agriculture as a vocation prior to and following a course of study in the principles and practices of agriculture.

It was found that students who had participated in courses in the principles and practices of agriculture increased in their desire to participate in agriculture related activities. Therefore, the null hypothesis is rejected.

Discussion

The author wishes to draw attention to the negative significant difference found between Form III and Form IV students in the contract schools and suggest that this is perhaps best described by the inability of the instrument to adequately measure the attitudes held by the students.

Another possible influence to consider is the time when the instrument was administered in the sequence of scheduled school events, and it is possible that a point of diminishing returns had been reached by the end of the third year of agricultural training and slight regression began to take place among the students.

It is possible that an instrument of greater sensitivity executed on a longitudinal basis may have resulted in the drawing of conclusions that appeared so apparent on the surface in the experience of the author.

APPENDICES

APPENDIX A

SURVEY OF ATTITUDE

NAME: _____ SCHOOL NUMBER: _____

SCHOOL: _____ FORM: _____ AGE: _____

DIRECTIONS:

Listed below are some statements that reflect attitudes. Below each is a scale of numbers. Place a check mark on the number that expresses your attitude according to the following description:

A. A check at the one (1) position will indicate that you have strong positive feelings toward the statement.

B. A check at the two (2) position will indicate your general agreement, but there might be reservations in your thinking.

C. A check in the three (3) position will indicate that you neither agree or disagree with the statement.

D. A check in the four (4) position will indicate that you disagree in general with the statement, but you have reservations in your thinking.

E. A check in the five (5) position will indicate that you have strong feelings of disagreement toward the statement.

EXAMPLE:

Providing free education is an obligation of any government.

1 ✓2 3 4 5

In the sample statement the scale is checked at the two (2) position, indicating that the evaluator agrees with the statement generally, but has certain reservations in his thinking before accepting unconditionally.

Please read each statement carefully. If there are questions, ask the administrator to explain anything you do

not understand. Take your time and check all statements.

STATEMENTS OF ATTITUDE

1. Wherever we live, we depend upon agriculture for our existence.

1 2 3 4 5

2. Population growth increases the demand upon the farmer.

1 2 3 4 5

3. It is not necessary for the farmer to keep up with new scientific developments.

1 2 3 4 5

4. Government officials need to be informed in the agricultural affairs of the country.

1 2 3 4 5

5. Secondary schools should offer a course in agriculture to acquaint all students with the importance of agriculture in nation building.

1 2 3 4 5

6. Farmers need a good education in order to improve the methods of production.

1 2 3 4 5

7. Agriculture is as important as other subjects in a general education.

1 2 3 4 5

8. Agriculture supplies many jobs to people who are not working on the farm.

1 2 3 4 5

9. A country's wealth has no relationship to its agriculture.

1 2 3 4 5

10. We become better citizens of our country when we understand the problems of agriculture.

1 2 3 4 5

11. The study of plant and animal production is necessary to a good general education.

1 2 3 4 5

12. City living is more pleasant than living on the farm.

1 2 3 4 5

13. You become more useful to your family when you have learnt something about agriculture.

1 2 3 4 5

14. Farming requires the making of decisions, the developing of plans, and the solving of problems.

1 2 3 4 5

15. To be successful, the farmer must learn new scientific developments.

1 2 3 4 5

16. It is not necessary that government officials be informed on agricultural matters.

1 2 3 4 5

17. All farming should be under governmental management.

1 2 3 4 5

18. All land should be held in trust by Government and leased to the farmers.

1 2 3 4 5

19. Good farming practices and high standards of living go together.

1 2 3 4 5

20. The wealth of farmers is closely related to the wealth of the country.

1 2 3 4 5

21. All citizens are responsible for the prevention of soil erosion.

1 2 3 4 5

22. Agriculture should only be taught to the students of lower ability in secondary schools.

1 2 3 4 5

23. Living on the farm is more pleasant than living in the city.

1 2 3 4 5

24. Members of families who get their living from the soil are more willing to assist each other than those who work in town.

1 2 3 4 5

25. Government should not claim ownership to land.

1 2 3 4 5

26. Farmers have a lower living standard than do city people.

1 2 3 4 5

27. Every family should own land upon which to grow crops.

1 2 3 4 5

28. Industry serves as the basis of the Kenya economy.

1 2 3 4 5

29. Modern education should train students to do things as well as to understand things.

1 2 3 4 5

30. Mothers should train their daughters in domestic arts rather than work in the fields.

1 2 3 4 5

31. Fathers should work and manage the shamba with their sons.

1 2 3 4 5

32. Mechanization of Kenya agriculture will create more jobs to reduce the unemployment problem

1 2 3 4 5

33. There should be no individual ownership of land.

1 2 3 4 5

34. All lands should be held in trust by the tribal leadership.

1 2 3 4 5

35. Land consolidation is necessary to efficient farm practices.

1 2 3 4 5

36. Education in agriculture is more important to the men of Kenya than it is to the women.

1 2 3 4 5

37. Continuous use of the land is more important to the small holder than to the large-scale farmer.

1 2 3 4 5

38. Ownership of land encourages the use of better farming methods.

1 2 3 4 5

39. Women should not be allowed the same social status as men.

1 2 3 4 5

40. As the methods on the farm improve, less hand labour is required.

1 2 3 4 5

41. Most women think household labour for hire as unrespectable.

1 2 3 4 5

42. Soil erosion is the concern only of the farmer.

1 2 3 4 5

43. Farming is dirty work and therefore should be left for the uneducated, low income earner.

1 2 3 4 5

44. Agriculture is a scientific subject like that of Biology and Chemistry.

1 2 3 4 5

45. People who work in agriculture do not share the same prestige as those in other kinds of work.

1 2 3 4 5

46. The work of agriculture is not based upon science.

1 2 3 4 5

47. The work of the farm should be left to the women of Kenya.

1 2 3 4 5

48. The subject of agriculture should be taught in the secondary schools of Kenya.

1 2 3 4 5

49. Agricultural subject matter requires the practical approach to learning.

1 2 3 4 5

50. It is not important that all people own land.

1 2 3 4 5

51. Agriculture is the basis of the Kenya economy.

1 2 3 4 5

52. Kenya's development depends upon how well farmers develop their land.

1 2 3 4 5

53. People who work in agriculture share the same social standing as people in other kinds of work.

1 2 3 4 5

54. Mechanization of Kenya agriculture will increase the unemployment problem.

1 2 3 4 5

55. Farmers do not need to be educated since they work only with the soil.

1 2 3 4 5

56. Co-operative efforts return better gains to the individual than does individual effort.

1 2 3 4 5

57. Industry is more important to the development of Kenya than agriculture.

1 2 3 4 5

58. Education is more important to a clerk than to a farmer.

1 2 3 4 5

59. Ownership of land is not necessary for all people.

1 2 3 4 5

60. Modern agricultural practices are essential to economic development.

1 2 3 4 5

61. An educated farmer will be more successful than the uneducated farmer.

1 2 3 4 5

62. Agricultural education is more important to the women than to the men.

1 2 3 4 5

63. Agriculture should not be taught in secondary schools.

1 2 3 4 5

64. Ownership of land should be the aim of all peoples in Kenya.

1 2 3 4 5

65. Women should have the same social status as men.

1 2 3 4 5

66. Farming should be a family operation, furnishing jobs for all of the family members.

1 2 3 4 5

67. The men should do the work of the farm in Kenya.

1 2 3 4 5

68. Lack of the appreciation of agriculture results in subsistance farming.

1 2 3 4 5

69. Individual effort results in greater rewards than does co-operative efforts.

1 2 3 4 5

70. Ownership of land should be everyone's right.

1 2 3 4 5

APPENDIX B

VOCATIONAL PREFERENCE SURVEY

NAME: _____ SCHOOL NUMBER: _____

SCHOOL: _____ FORM: _____ AGE: _____

DIRECTIONS:

This questionnaire has no right or wrong answers. You are asked to make a choice between two activities according to the one that you are most interested in or would rather do.

Also, listed below are some jobs in occupational areas in which students find employment after completion of school. Review these and select the area of vocational preference that interests you most. Place your selection in the blank space below.

1. Education -- This vocational area is represented by teachers, headmasters, librarians, University lecturers, laboratory demonstrators, educational inspectors, primary school teachers.

2. Law -- This area is represented by lawyers, judges, magistrates, police inspectors, policemen, private investigators.

3. Religion Social -- This area is represented by ministers, preachers, missionary social workers, Red Cross assistants.

4. Agriculture -- This area is represented by agricultural officers, farmers, veterinary officers, farm managers, farm equipment salesmen, technical assistants.

5. Engineering -- This area is represented by mechanics, carpenters, architects, road engineers, building contractors.

6. Medical -- This area is represented by doctors, medical assistants, research specialists, laboratory technicians.

7. Sales Clerical -- This area is represented by accountants, office managers, clerks, businessmen, route salesmen, bursars, bank tellers.

office assistants, school clerks.

_____ is my choice of vocational preference.

DIRECTION:

Place an X on the line opposite the activity that appeals to you most, or the activity in which you are most interested.

Example: I would rather

____ 1. Take a math course
__X__ 2. Study literature

In the example the student has indicated that he would rather study literature, so an X is placed on the line opposite the activity in which he is most interested.

Following are 84 paired activities. Make a choice of one activity in each pair.

ACTIVITIES

I would rather:

____ 1. Teach in a secondary school
____ 2. Advise farmers on the planting of crops

____ 3. Advise teachers in planning lessons
____ 4. Advise clients on legal matters

____ 5. Advise students on vocational opportunity
____ 6. Counsel young people about to be married

____ 7. Determine cost of tuition and boarding of students, and plan the school budget
____ 8. Study ways and implement means of reducing manufacturing cost on a product

____ 9. Demonstrate scientific theory to secondary school students in the laboratory
____ 10. Teach nurses how to take blood samples from patients

____ 11. Prepare schedule and daily routine for school classes
____ 12. Summarize sale receipts for monthly report to the Head Office

13. Maintain farm records on dairy production
14. Prepare term grade reports on students

15. Plan a cropping system for the farm
16. Draft rules, bylaws, and regulations for a company organization

17. Spray livestock to control parasites
18. Assist applicants to obtain welfare

19. Adjust and calibrate farm machinery for planting of maize
20. Work on the development of a stronger metal

21. Carry out population effect research on maize
22. Seek methods of combating the spread of smallpox

23. Grade and candle eggs for market
24. Prepare a sales window display

25. Enforce law and order among the people of a community
26. Decide school policy and maintain discipline in a school

27. Represent a client in the law courts
28. Be an authority on soil conservation

29. Represent a client in a divorce case
30. Counsel people on moral problems

31. Investigate facts of client's claim and represent interest of the client
32. Prepare operational report on machinery adaptability under field conditions

33. Draft the last will and testament of a client
34. Prescribe medicine for the sick

35. Give legal opinion before a court of law
36. Answer technical questions concerning quality of merchandise

37. Serve on the Board of Governors of a secondary school
38. Plan a syllabus for students in secondary school

39. Attend training courses for local church leaders
40. Attend course on the revision of construction standards

____ 41. Plan a program for world missions
____ 42. Assist in a medical clinic

____ 43. Supervise and train evangelist staff for church work
____ 44. Supervise and train salesmen to promote sales of product

____ 45. Operate a welfare food station
____ 46. Clear land of bush to plant crops

____ 47. Visit the sick at home or in hospital
____ 48. Arbitrate on or solve differences between parties in dispute

____ 49. Test a new machine for its adaptability to certain work
____ 50. Teach students a new principle or idea

____ 51. Build a machine to perform a certain task
____ 52. Read x-rays and prescribe treatment for patients

____ 53. Plan safety standards for machines
____ 54. Plan a sales promotion program for salesmen

____ 55. Test materials for their suitability in use for construction
____ 56. Conduct fertility research in the production of maize

____ 57. Inspect structures for safe conditions
____ 58. Patrol a community to prevent crime

____ 59. Read technical material on mechanical design
____ 60. Read accounts of social problems and assistance given to those in need

____ 61. Perform test in laboratory to confirm a medical diagnosis
____ 62. Write a test to evaluate the effectiveness of teaching

____ 63. Conduct research to find the cause of a disease condition
____ 64. Make a sales survey to determine effect of sales promotion work

____ 65. Prescribe diets to be followed by patients
____ 66. Plan a feeding ration for dairy cattle

____ 67. Treat a mentally disturbed person
____ 68. Prosecute a case in criminal law

69. Organize a health clinic in a rural area
70. Establish a church in a remote area

71. Design a new technique for vaccinations
72. Test quality of new materials for Government

73. Plan advertisement for a specified product
74. Plan a syllabus for teaching biology

75. Attend a customer in the store
76. Cultivate a field of pyrethrum

77. Compile monthly reports of sales
78. Draft legal documents

79. Contact potential new customers
80. Visit the bereaved to console them

81. Demonstrate new equipment to a customer
82. Redesign equipment to correct for weaknesses

83. Attend to a dissatisfied customer's complaint
84. Give medical assistance at all hours of the day or night

APPENDIX C

MEANS, STANDARD DEVIATIONS AND t VALUES OF STUDENTS' ATTITUDES SCORES BY FORM

TABLE IV

SCHOOL NUMBER 1

Forms	Number of Students		Means	S.D.	t Value
	Control	Contract			
1 vs. 2	34	29	2.58 2.46	.43 .50	1.23
1 vs. 3	34	19	2.58 2.57	.43 .32	.08
1 vs. 4	34	20	2.58 2.52	.43 .23	.52
2 vs. 3	29	19	2.46 2.57	.50 .32	1.20
2 vs. 4	29	20	2.46 2.52	.50 .23	.79
3 vs. 4	19	20	2.57 2.52	.32 .23	.51
1 & 2 vs. 3 & 4	63	39	2.52 2.55	.38 .27	.31

TABLE V

SCHOOL NUMBER 2

Forms	Number of Students		Means	S.D.	t Value
	Control	Contract			
1 vs. 2	71	60	2.45 2.41	.52 .68	.33
1 vs. 3	71	33	2.45 2.38	.52 .58	.61
1 vs. 4	71	15	2.45 2.36	.52 .41	.57
2 vs. 3	60	33	2.41 2.38	.68 .58	.25
2 vs. 4	60	15	2.41 2.36	.68 .41	.26
3 vs. 4	33	15	2.38 2.36	.58 .41	.09
1 & 2 vs. 3 & 4	131	46	2.43 2.37	.60 .54	.59

TABLE VI

SCHOOL NUMBER 3

Forms	Number of Students		Means	S.D.	t Value
	Control	Contract			
1 vs. 2	29	65	2.54 2.48	.15 .41	1.74
1 vs. 3	29	54	2.54 2.57	.15 .47	.33
1 vs. 4	29	52	2.54 2.58	.15 .57	.37
2 vs. 3	65	54	2.48 2.57	.41 .47	1.32
2 vs. 4	65	52	2.48 2.58	.41 .57	1.07
3 vs. 4	54	52	2.57 2.58	.47 .57	.10
1 & 2 vs. 3 & 4	94	106	2.44 2.58	.36 .52	.94

TABLE VII

SCHOOL NUMBER 4

Forms	Number of Students		Means	S.D.	t Value
	Control	Contract			
1 vs. 2	69	68	2.32 2.31	.25 .33	.23
1 vs. 3	69	55	2.32 2.18	.25 .22	3.02**
1 vs. 4	69	51	2.32 2.41	.25 .21	1.75
2 vs. 3	68	55	2.31 2.18	.33 .22	2.04*
2 vs. 4	68	51	2.31 2.41	.33 .21	1.44
3 vs. 4	55	51	2.18 2.41	.22 .21	-4.24**
1 & 2 vs. 3 & 4	137	66	2.32 2.29	.28 .24	.75

*Significant at the .05 level.
**Significant at the .01 level.

TABLE VIII

SCHOOL NUMBER 5

Forms	Number of Students		Means	S.D.	t Value
	Control	Contract			
1 vs. 2	65	79	2.30 2.27	.42 .32	.41
1 vs. 3	65	60	2.30 2.17	.42 .26	1.95
1 vs. 4	65	56	2.30 2.29	.42 .19	.10
2 vs. 3	79	60	2.27 2.17	.32 .26	1.94
2 vs. 4	79	56	2.27 2.29	.32 .19	.32
3 vs. 4	60	56	2.17 2.29	.26 .19	-2.32*
1 & 2 vs. 3 & 4	144	96	2.28 2.22	.36 .24	1.54

*Significant at the .05 level.

TABLE IX

SCHOOL NUMBER 6

Forms	Number of Students		Means	S.D.	t Value
	Control	Contract			
1 vs. 2	33	28	2.34 2.31	.24 .39	.37
1 vs. 3	33	28	2.34 2.25	.24 .19	2.00*
1 vs. 4	33	29	2.34 2.32	.24 .37	.29
2 vs. 3	28	28	2.31 2.25	.39 .19	1.02
2 vs. 4	28	29	2.31 2.32	.39 .37	.07
3 vs. 4	28	29	2.25 2.32	.19 .37	1.15
1 & 2 vs. 3 & 4	61	57	2.33 2.28	.31 .30	.95

*Significant at the .05 level.

TABLE X

SCHOOL NUMBER 7

Forms	Number of Students		Means	S.D.	t Value
	Control	Contract			
1 vs. 2	31	28	2.27 2.51	.25 .21	.70
1 vs. 3	31	7	2.27 2.19	.25 .25	.79
1 vs. 4	31	11	2.27 2.09	.25 .24	2.01*
2 vs. 3	28	7	2.51 2.19	.21 .25	1.55
2 vs. 4	28	11	2.51 2.09	.21 .24	2.75**
3 vs. 4	7	11	2.19 2.09	.25 .24	.77
1 & 2 vs. 3 & 4	59	18	2.29 2.13	.25 .24	2.52*

*Significant at the .05 level.
**Significant at the .01 level.

TABLE XI

SCHOOL NUMBER 8

Forms	Number of Students		Means	S.D.	t Value
	Control	Contract			
1 vs. 2	65	17	2.54 2.26	.64 .56	2.71**
1 vs. 3	65	8	2.54 2.50	.64 .29	.17
1 vs. 4	65	33	2.54 2.49	.64 .58	.41
2 vs. 3	47	8	2.26 2.50	.56 .29	1.78
2 vs. 4	47	33	2.26 2.49	.56 .58	-2.81**
3 vs. 4	8	33	2.50 2.49	.29 .58	.07
1 & 2 vs. 3 & 4	112	41	2.42 2.50	.55 .56	.78

**Significant at the .01 level.

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