

**USING SUPERVISED AGRICULTURAL EXPERIENCE PROGRAMME AS
A TEACHING APPROACH TO CHANGE STUDENTS' ATTITUDE
TOWARDS PRACTICAL AGRICULTURE AMONG SECONDARY SCHOOL
AGRICULTURE STUDENTS: A CASE OF MIGORI COUNTY, KENYA**

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ABSTRACT: *Agricultural education in secondary schools in Kenya is offered to achieve various outcomes among the learners as anchored in the school syllabus. One of the key learning outcomes is a positive attitude in practical agriculture. This study was done among form three agriculture students in Migori County and focused on finding out if there was a difference in attitude towards practical agriculture between students who took part in a supervised agricultural experience programme and those who did not take part. A learning outcome test was used to gather relevant data before and after the programme implementation. Analysis of data was done using SPSS (Version 22). Descriptive statistics (frequencies and averages) were used to present data while charts were used to present the data. Inferential statistics (Independent sample t-test, one-way ANOVA and Tukey's post hoc) were used to test the null hypothesis at $\alpha=.05$ significance level. The study discovered that there was a statistically significant difference in attitude towards practical Agriculture between secondary school Agriculture students exposed to SAE and those not exposed to SAE.*

KEYWORDS: Supervised agricultural experience, learning outcome, attitude, secondary students, agricultural education

INTRODUCTION

Agriculture is a practical subject which calls on the learners to be more focused on practical activities, however its teaching in Kenyan schools has been theory oriented. The subject has been taught in Kenya for long but teaching and training methods are still focused on transferring knowledge which is majorly applied in examinations (Vandenbosch, 2006). Practical teaching which should be the main component of the teaching and learning processes in Agriculture has many challenges (Waithera, 2013), including the mere lack of the requisite facilities. Agricultural instruction in Kenyan schools has also been seen to be done without proper guidelines hence knowledge transfer has remained theoretical. This has compounded the problem of lack of interest and poor performance of students in Agriculture (Daluba, 2013). Although secondary school Agriculture teaching and learning had been in existence for long, teaching and learning strategies still focus on transferring knowledge which is judged to be useful in examinations (Tesha, 2018). The teaching of secondary school Agriculture in Kenya has been isolated from the actual farming situations since the beginning of the 8-4-4 system of education (Ngugi, Isinika & Kitali, 2002). Teachers who are the curriculum implementers are isolated from the practical realities of Agriculture and farming due to

the reality that schools cannot support travels to places of agricultural interest such as model farms, agricultural research stations and agricultural information centres where they can get the updated information on the state of agricultural knowledge and practices. This theoretical approach in teaching of Agriculture has a direct effect on the students' learning of Agriculture in schools and the impacts on the future of agricultural practices. It is fundamentally important to shift from theory-based to practical and hands-on strategies in agricultural instructions in schools. The theoretical approach in teaching and learning of the subject has led to many secondary school students taking agriculture to perceive the subject as a dirty one hence few enrol for it. They just want to read it theoretically to achieve higher grades that can catapult them to other careers other than agriculture. There is need therefore to change how this subject is taught in Kenya so that learners can appreciate that this is a subject through which one has to soil their hands to be called an agriculturalist.

In the United States of America (USA), it has been witnessed that young people keep shifting from the rural to urban areas (Glassman, Elliot & Knight, 2006) due to the poor attitude they have towards practising agriculture. This problem compounded by the general negative perceptions in Agriculture has brought a multiplying effect to this catastrophe. As society moved further away from the farm, the United States Department of Agriculture (USDA) realized the need for educating its population about Agriculture. In 1981, the USDA marked the start of the Supervised Agricultural Experience (SAE) programme with an overall intention of educating students on the significant roles and overall function Agriculture has in society (Farm Bureau Federation, 1983). The SAE programme has been used effectively to teach Agriculture since then. Agricultural knowledge and positive attitudes towards practical work are listed benefits students gain from SAEs (Dyer & Williams, 1994).

There is an urgent call to have many people especially school-going young people practice agriculture if the future of agricultural production is to be assured.

The Problem

Agriculture is significant Kenya, therefore the need for more students taking up Agriculture. The students' enrolment in KCSE Agriculture and uptake in post-secondary institutions is on a downward trend. It is important therefore that Kenya urgently changes how Agriculture is taught in schools in order to improve the learners' interest in this subject. These problems which contribute to the afore-mentioned could be due to poor acquisition of knowledge and skills based on how Agriculture is taught in schools. It is against this backdrop that this research was conducted to find out how to improve the attitude of the school students in practical Agriculture through supervised agricultural experience programme in secondary schools.

Purpose of the Study

The purpose of the study was to determine how attitude in practical secondary school agricultural education can be improved through supervised agricultural experience programme.

Objectives and Hypotheses of the Study

The objective of the study was:

- i. To find out the difference in attitude towards practical Agriculture between secondary school Agriculture students exposed to SAE and those not exposed to SAE.

The hypothesis of the study was:

- i. There is no statistically significant difference in attitude towards practical Agriculture between secondary school Agriculture students exposed to SAE and those not exposed to SAE

LITERATURE

Students' Attitudes towards Practical Agriculture

Attitude is an inward feeling displayed in outward behaviour of individuals (Waithera, 2013). People always display on the outside what they feel inside. There are three components of attitude; affective, cognitive and behavioural (Borg & Gall, 1989). The affective component refers to individuals feelings about the attitude object, cognitive is an individual's belief or knowledge about the attitude object and behavioural is an individual's predisposition to act towards the attitudes object in a particular way. The teachers and learners have certain feelings, beliefs and knowledge with regard to Agriculture as a subject. The status of Agriculture as a less serious subject dates back to the colonial period. There was the creation of indigenous schools to offer academic education which was offered only to the Europeans who were the rulers and Asians who were their assistants. Agriculture was offered to the worker and Africans received what was meant to be for the worker. This led to resentment and a negative attitude towards the training offered to the Africans (Konyango, 2010). This seems to have been carried forward to date with the learners.

Six attitudinal factors have been identified by Boliyan (2015). These are: attitude in Agriculture, the will to study the subject, perceived usefulness of the subject, value attached to Agriculture, feelings towards the subject and interest in it were identified. It has been further identified that influence of parents greatly affects learners' attitude towards the subject and career prospects. In Nigeria for example, the general observable trend is that parents who are health workers, lawyers, politicians, members of the disciplined forces among others wish their children to take up related careers. In view of this, the general assumption would have been that successful agriculturalists would be at the front burner in encouraging their sons and daughters to take after their careers and leverage on the enormous potential the Agriculture as a profession has to offer; however, this seems not to be the case (Adebo & Sekunmade, 2013). Therefore, it is prudent to look into the current attitude of successful professionals in Agriculture who are parents or guardians in order to determine their perspective to their wards taking Agriculture as a profession in order to give insight and recommendations that will be

focused towards ensuring that these great influencers of students' choice of career properly play their role in orienting, motivating and educating wards people them to leverage on the many career prospects in the agricultural sector (Olorunfemi, Oladipo, Oladele, & Oladele, 2016).

Most Agriculture schools in Kenya use land and other available facilities properly in teaching practical Agriculture. However, the actual status of these learning resources and the students' participation in running them tends to make students have negative perceptions against them (Njoroge & Orodho, 2014). The learners see the resources as properties of the school hence cannot appreciate the values they have to offer in their school life. They consequently see Agriculture as just a subject which enables them to navigate the education pathway.

METHODOLOGY

Research Design

The study used the pre-test post-test none-equivalent control group design, a quasi experimental design where subjects are non-randomly assigned to treatment and control groups. Experimental group members were given a pre-test, involved in the experiment and then given a post-test. The non-equivalent control group received a pre-test, not subjected to the treatment, and then a post-test was administered. The control group would have characteristics that are resemble the treatment group, but the participants would lack random assignment to this group due difficulty in doing so (SAGE, 2019).

Research Location

The study was conducted in Migori County, Kenya. The location of the County is as shown in Figure 1.



Figure 1. The location of the study area

Sampling Methods

Using Cochran's (1977) formula for determining sample size, 384 students of Agriculture were selected. The equation for calculating sample size is shown here-in:
Unlimited population: $N = \frac{z^2 \times \hat{p} (1 - \hat{p})}{\epsilon^2}$

Where;

ϵ^2

z = the z score

ε = the margin of error

N = population size

\hat{p} = the population proportion

According to this study, the researcher adopted 95% confidence with a margin of error of 5%, assuming a population proportion of .5, and unlimited population size. Taking note that z for a 95% confidence level is 1.96 from the z-table. Substituting the formula therefore;

$$N = \frac{1.96^2 \times .5(1 - .5)}{.05^2} = 384.16$$

Consequently, a sample of 384 was arrived at distributed as listed in Table 1.

Table 1. Sample of Students Included in the Study Based on Types of Schools

School Type	Number Of Schools	Total Agriculture Students	Number Of Schools Sampled	Sample Size
Boys'	13	390	2	48
Girls'	17	420	2	48
Mixed	179	2,880	12	288
Total	214	3,690	16	384

Instrumentation and Data Collection

A test was used to collect data. The test was constructed using Likert scale. It collected information on the knowledge in agriculture before implementation and after implementation of the programme. Before the programme began, a test was given with items addressing knowledge in agriculture. Data was collected to ascertain the student's knowledge in the specific agriculture content. After this, the students were assigned into the experimental and control groups (having only one group in a school to avoid diffusion of information to control groups). The experimental group was instructed about the programme which involved growing of coriander crop. They grew the crop taking part in all agronomic practices from land preparation, planting to harvesting and disposal. The control group did not take part in the programme. After this, another round of data collection from the two independent groups and comparisons made with respect to knowledge in agriculture.

Data Analysis

The collected data was first cleaned up for any errors such as incompleteness or inaccurate marking of responses. Data was then coded and recorded to reduce mass for ease of analysis. Data was then entered into the computer for analysis using Statistical Packages for Social Sciences Version 22. Descriptive statistics was used in describing nominal data for this study. Data was further analysed and presented using measures of central tendency i.e. means and percentages where appropriate. The data was measured as indices generated from score in the 13 test items, each with a minimum of 1 and a maximum of 5. The maximum score for the student's attitude would be 5 implying that the higher the score, the higher the attitude towards practical Agriculture. This was

interpreted as: 1-1.84 = very low attitude, 1.85-2.64 = low attitude, 2.65-3.44 = moderate attitude, 3.45-4.24 = high attitude and 4.25-5.0 = very high attitude.

RESULTS AND DISCUSSIONS

Agriculture is the Simplest and Most Basic among the School Subjects

The respondents were asked their opinion on whether or not Agriculture is the simple and the most basic among the subjects they study in school and the responses are as shown in Table A₁. Before the SAEP, 1.0% of the respondents in the experimental group strongly disagreed, 13.0% disagreed, 6.8% were undecided, majority (52.1%) agreed while slightly higher than a quarter (27.1%) strongly agreed that Agriculture is the simple and the most basic among the subjects. After the SAEP, none of the respondents in the experimental group strongly disagreed, none disagreed, majority (62.5%) were undecided, none agreed while 37.5% strongly agreed that Agriculture is the simple and the most basic among the subjects showing a decline in the group mean from 3.91 in the pre-test to 3.75 in the post-test both of which were high attitudes scores.

It can also be seen that before the SAEP, 3.6% of the students in the control group strongly disagreed, 7.3% disagreed, 8.9% were undecided, 28.1% agreed while majority (52.1%) strongly agreed that Agriculture is the simple and the most basic among the subjects. After the SAEP, 3.6% of the respondents in the control group strongly disagreed, 5.7% disagreed, 8.9% were undecided, 28.1% agreed while the majority (53.6%) strongly agreed that Agriculture is the simple and the most basic among the subjects, with a pre-test mean of 4.18 to a post test mean of 4.17, both of which were high scores.

Effectiveness of Agriculture Subject to Students of Differing Abilities and Levels

The respondents were asked their opinion on effectiveness of Agriculture subject to students of different abilities and the results are as illustrated in Table A₁. Prior to the SAEP, 8.9% of the respondents in the experimental group strongly disagreed, 17.7% disagreed, 12.0% were undecided, majority (51.0%) agreed and 10.4% strongly agreed that Agriculture is effective to learners of different abilities. After the SAEP, none of the respondents in the experimental group strongly disagreed, none disagreed, none were undecided, majority (62.5%) agreed while 37.5% strongly agreed that Agriculture is effective to learners of different abilities. This indicated a moderate pre-test score of 3.36 and a very high post-test score of 4.38.

On the other hand, before the SAEP, slightly more than a fifth (22.9%) of the students in the control group strongly disagreed, 15.1% disagreed, 23.4% were undecided, and 22.9% agreed while another 15.7% strongly supported the opinion that Agriculture is effective to learners of different learning capabilities. After the SAEP, about a fifth (20.9%) of the respondents in the control group strongly disagreed, 15.6% disagreed, 24.0% were undecided, 23.4% agreed while 16.1% strongly agreed that Agriculture is effective to learners of different abilities, an indication of pre-test score of 2.92 and a post-test score of 2.91 showing no major increase. From the findings, it can be said that as a result of the programme, there was more shift in the experimental group towards higher attitude levels regarding Agriculture being effective to learners of different abilities than can be witnessed among learners who did not take part in the programme.

It is always important that the instructor selects the most appropriate teaching strategy, though this may not be possible especially for large classes as affirmed by Pius Communications (2019), combining all of the learner differences within each classroom enables the teachers to seek strategies that help them to teach all students effectively in mixed-ability classes.

Suitability of Agriculture Subject to Students of Different Gender

The respondents were asked their opinion on whether Agriculture subject is more suited to boys than girls and the results are as illustrated in Table A₁. Before engaging in SAEP, 24.0% of the respondents in the experimental group strongly disagreed, 19.3% disagreed, 43.2% were undecided, 6.8% agreed and another 6.8% in that order strongly agreed that Agriculture subject is more suited to boys than girls. After the SAEP, none of the respondents in the experimental group strongly disagreed and disagreed that Agriculture subject is more suited to boys than girls while 13.5% were still undecided, half of them (50.0%) agreed while 36.5% strongly agreed that Agriculture subject is more suited to boys than girls. This showed an increase in the attitude from a low pre-test score of 2.53 to a very high post-test score of 4.23.

On the other hand, before the programme, 44.8% of the students in the control group strongly disagreed, 16.1% disagreed, 15.1% were undecided, and 12.5% agreed while another 11.5% were strongly in support of the opinion that Agriculture subject is more suited to boys than girls. After the SAEP, 43.2% of the respondents in the control group strongly disagreed, 16.1% disagreed, 14.6% were undecided, another 14.6% agreed while 11.5% strongly agreed that Agriculture subject is more suited to boys than girls, showing nearly the same means for pre-test and post-test at 2.27 and 2.35 respectively. It can be seen that after the programme, more respondents in the experimental group than control group had increased their attitude towards the fact that Agriculture is more suited to boys than girls, consequently it can be said that practical Agriculture in which they were involved to some extent proved to be more boy-friendly than girl-friendly. It can further be said that the perception about masculinity of agricultural activities was low but increased after they took part in this programme. This is in contrast with the findings of Darko, Yuan, Opoku, Ansah and Liu (2016) which found out that gender had no significant influence on students' attitude towards the learning of agricultural science. This is also despite the fact that women provide insignificant contribution in the agricultural sector where they contribute a large portion of the measured contributions to agricultural labour, and their share of the measured agricultural labour-force has a big impact on agricultural productivity at national level (Quisumbing, Meinzen-Dick, Raney, Croppenstedt, Behrman, and Peterman, 2014).

Opinion on Secondary School Agriculture Preparation of Students with Practical Skills Needed for the Future

The respondents were asked their opinion on whether secondary school Agriculture prepares students with practical skills needed for the future and the results are as illustrated in Table A₁. Prior to taking part in SAEP, only 4.7% of the respondents in the experimental group strongly disagreed that secondary school Agriculture prepares students with practical skills needed for the future, 16.1% disagreed, 40.1% were undecided. Another 16.7% agreed while 22.4% strongly agreed that secondary school Agriculture prepares students with practical skills needed for the future. In the period

following SAEP, none of the respondents in the experimental group strongly disagreed, disagreed and were undecided that secondary school Agriculture prepares students with practical skills needed for the future. Majority (62.5%) agreed while 37.5% strongly agreed that secondary school Agriculture prepares students with practical skills needed for the future. This was a pre-test score of 3.36 (moderate) and a post-test score of 4.38 (very high).

On the other part, before the programme, 9.9% of the students in the control group strongly disagreed, 10.9% disagreed, 6.8% were undecided, and 32.3% agreed while another a significant number (40.1%) were strongly in support of the fact that secondary school Agriculture prepares students with practical skills needed for the future. After the SAEP, 9.9% of the respondents in the control group strongly disagreed, 12.0% disagreed, 12.0% were undecided, another 31.3% agreed while 34.9% strongly agreed that Secondary school Agriculture prepares students with practical skills needed for the future, showing a slight decline in the post-test score of 3.69 from a pre-test score of 3.78. It can also be said in this case that there was a greater change among the respondents in the experimental group with respect to the opinion that Agriculture prepares them for the future and that the knowledge obtained today could be applied in future.

Opinion on Agriculture Field Practices Appropriateness to Learners

The secondary school Agriculture students were asked to indicate the appropriateness of agricultural field practices to the learners and the results are as illustrated in Table A₁. Before SAEP, 7.3% of the respondents in the experimental group strongly disagreed to the statement that the field practices are appropriate to the learners, about half (49.4%) of them disagreed, 6.3% were undecided on whether the field practices are appropriate to the learners or not. Another 19.8% agreed while 17.2% strongly agreed to the statement that the field practices are appropriate to the learners. After the SAEP implementation, none of the respondents in the experimental group strongly disagreed, disagreed or were undecided to the statement that the field practices are appropriate to the learners. Majority (62.5%) agreed while 37.5% strongly agreed that the field practices are appropriate to the learners. This was a pre-test score of 2.90 and a post-test score of 4.38 in this group.

In the control group, before the SAEP, 15.6% of the respondents strongly disagreed, 5.7% disagreed, 6.2% were undecided, and 42.7% agreed while about a third (29.8%) were strongly in support of the statement that the agricultural field practices are appropriate to the students of Agriculture. In the post test period, 15.6% of the respondents in the control group strongly disagreed, 5.7% disagreed, 6.3% were undecided, another 42.7% agreed while 29.7% strongly agreed that the field practices in Agriculture are appropriate to the learners, and indication of little change in group pre-test and post-test scores of 3.73 and post-test score of 3.75. It can be seen therefore that there was an increase in the learner's perception regarding appropriateness in the field practices in Agriculture among the participants who took part in the programme while there was no change among those who did not take part.

The Climatic Conditions in My School Affect the Teaching and Learning of Agriculture

The study participants were asked to indicate if the climatic conditions in their school affect the teaching and learning of Agriculture and the results are as illustrated in Table A₁. Before engaging in the programme, 14.1% of the respondents in the experimental group strongly disagreed to the statement that climatic conditions in their school affect the teaching and learning of Agriculture, slightly more than a fifth (21.4%) disagreed, 5.2% were undecided on whether the climatic conditions in their school affect the teaching and learning of Agriculture. About a half (48.4%) of the participants agreed while 10.9% strongly agreed that the climatic conditions in their schools affect the teaching and learning of Agriculture. After the SAEP implementation, none of the respondents in the experimental group strongly disagreed or disagreed that the climatic conditions in their school affect the teaching and learning of Agriculture. Only 1.0% were undecided while slightly more than half (51.0%) agreed and another 47.9% strongly agreed that the climatic conditions in their school affect the teaching and learning of Agriculture. It was an increase in the group score with moderate (3.21) in the pre-test and very high (4.47) in the post-test.

In the control group before the SAEP, 32.3% of the respondents strongly disagreed, 19.3% disagreed, 9.4% were undecided, and 20.3% agreed while about a fifth (18.8%) were strongly in support of the statement that the climatic conditions in their school affect the teaching and learning of Agriculture. In the post test period, 32.3% of the respondents strongly disagreed, 19.3% disagreed, 9.9% were undecided, another 20.8% agreed while 17.7% strongly agreed that the climatic conditions in their school affect the teaching and learning of Agriculture. This was a pre-test score of 2.71 and a post-test score of 2.72. It should be noted that agricultural practices in any locality greatly depend on climate and even weather events. After the respondents in the experimental group took part in the venture, there was a big increase in the number of those who appreciated that climate indeed affects agricultural activities, contrary to their counterparts in the control group who did not grow the crop hence were not able to appreciate the effects of climate on production of crops in the school.

Willingness of Students in Form Three to Select Agriculture as a Study Subject

The study participants were asked to indicate if Form Three students willingly select Agriculture as one of the subjects of study and the results are as illustrated in Table A₁. Before engaging in the programme, 6.3% of the respondents in the experimental group strongly disagreed to the statement that students in Form Three willingly select Agriculture as one of the subjects of study, slightly more than half (52.1%) disagreed, 5.2% were undecided on whether the students in Form Three willingly select Agriculture as one of the subjects of study. 22.9% of the participants agreed, while 13.5% of them strongly agreed that the students in Form Three willingly select Agriculture as one of the subjects of study. After the SAEP implementation, none of the respondents in the experimental group strongly disagreed or disagreed that the students in Form Three willingly select Agriculture as one of the subjects of study. Only 3.1% were undecided while slightly more than half (51.6%) agreed and another 45.3% strongly agreed that the students in Form Three willingly select Agriculture as one of the subjects of study. These were moderate pre-test score of 2.85 and a high post-test score of 4.42.

In the control group, before the SAEP, 13.0% of the respondents strongly disagreed, 9.9% disagreed, 8.9% were undecided, and 43.8% agreed while 24.5% strongly supported the statement that the students in Form Three willingly select Agriculture as one of the subjects of study. In the post test period, 13.0% of the respondents in the control group strongly disagreed, 9.9% disagreed, 9.9% were undecided, another 43.2% agreed while 24.0% strongly agreed that the students in Form Three willingly select Agriculture as one of the subjects of study. This was moderate score for the pre-test and post-test category at 3.51 and 3.55 respectively. Several studies have been done to show forces behind students' choice of Agriculture as well as other study subjects for example Muchema (2013) revealed low student enrolment in Agriculture in Kiambu East District Kenya. The study further identified parental influence and career guidance as key factors for downward trend in enrolments in Agriculture subject. Availability of teaching resources was also cited as an influence of students' choice to take Agriculture.

Practising and Working on the Farm is Necessary for a Career in Agriculture

The respondents were asked to indicate their opinion on if practising and working on the farm is necessary for a career in Agriculture and the results are as illustrated in Table A₁. In advance of the SAEP, 9.9% of the respondents in the experimental group strongly disagreed to the opinion that practising and working on the farm is necessary for a career in Agriculture, majority (53.6%) disagreed, 6.8% were undecided on the idea that practising and working on the farm is necessary for a career in Agriculture. Moreover, 18.8% of the respondents agreed, while 10.9% of them strongly agreed that growing a crop on a farm is necessary and pleasant for future professionals in Agriculture. After the programme was undertaken, none of the respondents in the experimental group strongly disagreed or disagreed that practising and working on the farm is necessary for a career in Agriculture. Only 1.0% were undecided while half (50.0%) of them agreed and a further 49.0% strongly agreed that practising and working on the farm is necessary for a career in Agriculture. This was a moderate pre-test score of 2.67 and a very high post-test score of 4.48.

For those not taking part in the SAEP, 17.2% strongly disagreed, 9.9% disagreed, 15.1% were undecided, and 36.5% agreed while 21.4% strongly agreed practising and working on the farm is necessary for a career in Agriculture. This was during the pre-test period. In the post test period, 17.2% of the respondents in the control group strongly disagreed, 10.4% disagreed, 17.2% were undecided, 34.4% agreed with 20.8% strongly agreeing that practising and working on the farm is necessary for a career in Agriculture, showing 3.35 and 3.31 pre-test and post-test scores respectively. It can be seen therefore that there was an increase in the mean in the post test among the experimental group compared to control group, what can be attributed to the influence of the programme.

Most Careers in Agriculture do not Involve a Great Amount of Manual Labour

The study sought to find out the respondents' opinion regarding the fact that agricultural careers do not involve a lot of manual labour and the results are as illustrated in Table A₁. Before the SAEP, 14.1% of the respondents in the experimental group strongly disagreed to the opinion that agricultural careers do not involve a lot of manual labour, 17.2% disagreed while 6.8% were undecided. Furthermore, 17.7% of the respondents agreed, while 44.3% of them strongly agreed that agricultural careers involve little

manual labour. After the programme was undertaken, none of the respondents in the experimental group strongly disagreed, disagreed, undecided or agreed on the opinion that agricultural careers do not involve a lot of manual labour. All of them strongly agreed that agricultural careers do not involve a lot of manual labour, showing a moderate pre-test score of 3.61 and a very high post-test score of 5.00.

For those not taking part in the SAEP, 26.6% strongly disagreed, 7.8% disagreed, 12.0% were undecided, and 35.4% agreed while 18.2% strongly agreed that agricultural careers do not involve a lot of manual labour as reported for pre-test. In the post-test period, 26.6% of the respondents in the control group strongly disagreed, 7.8% disagreed, 14.1% were undecided, a third (33.3%) agreed with 18.2% strongly agreeing that agricultural careers do not involve a lot of manual labour, an indication of 3.11 and 3.09 pre-test and post-test scores respectively. This shows that there was an increase in the post-test scores for the experimental group while for the control group that did not take in SAEP, the pre-test and post-test means were near constant.

I Can Define Practical Agricultural Education and Training and Provide an Example

The study sought to find out the level of the respondents' ability to define agricultural education and training and provide relevant examples and the results are as illustrated in Table A₁. Before the SAEP, 7.3% of the respondents in the experimental group strongly disagreed to the opinion that they can define agricultural education and training and provide relevant examples, 14.6% disagreed while 5.2% were undecided. Moreover, 22.4% of the respondents agreed, while majority (50.5%) strongly agreed that they can define agricultural education and training and provide relevant examples. After the programme was undertaken, none of the respondents in the experimental group strongly disagreed, disagreed, undecided or agreed on the opinion that they can define agricultural education and training and provide relevant examples. All (100.0%) strongly agreed that they could define agricultural education and training and provide relevant examples, showing a moderate pre-test score of 3.94 and a very high post-test score of 5.00 in this group.

For control group, 10.9% strongly disagreed, 8.3% disagreed, 10.9% were undecided, and 45.3% agreed while 24.5% strongly agreed that they could define agricultural education and training and provide relevant examples. In the post-test result, 15.1% of the respondents in the control group strongly disagreed, 6.8% disagreed, 13.5% were undecided, 32.3% agreed with another 32.3% strongly agreeing that they could define agricultural education and training and provide relevant examples, giving 3.66 and 3.60 pre-test and post-test scores in that order. The group taking part in SAEP therefore showed a higher increase in score while for the control group that did not take in SAEP, the pre-test and post-test means were almost similar.

Agriculture Farm Work Contributes Positively to the Economy of Our Country

Agriculture is the backbone of Kenyan economy hence this study sought to find out the respondents' opinion regarding positive contribution of Agriculture farm work to the economy and the result is as illustrated in Table A₁. Prior to the SAEP, 10.4% of the participants in the experimental group strongly disagreed to the opinion that Agriculture farm work contributes positively to the economy, 14.6% disagreed while 5.7% were

undecided. Moreover, about a half (49.5%) of the respondents agreed, while another 19.8% strongly agreed that Agriculture farm work contributes positively to the economy. After the programme was undertaken, none of the respondents in the experimental group strongly disagreed, disagreed, or were undecided on the opinion that Agriculture farm work contributes positively to the economy. Majority (62.5%) agreed and another 37.5% strongly agreed that Agriculture farm work contributes positively to the economy, giving a moderate pre-test score of 3.54 and a very high post-test score of 4.38 for the experimental group.

For control group, 15.6% strongly disagreed, 5.2% disagreed, 12.0% were undecided, and about a third (31.8%) agreed while just more than a third (35.4%) strongly agreed that Agriculture farm work contributes positively to the economy. In the post-test, 15.1% of the respondents in the control group strongly disagreed, 6.8% disagreed, 13.5% were undecided, 32.3% agreed with another 32.3% strongly agreeing that Agriculture farm work contributes positively to the economy, an indication of 3.66 and 3.60 pre-test and post-test scores in that order. The experimental therefore showed a higher post-test score while for the control group that did not take in SAEP, the pre-test and post-test means were near similar.

I Would Prefer to Live in Rural Area and Practice Agriculture

Agriculture and agricultural practices are mostly rural-based and one willing to engage in Agriculture should be willing to be a rural dweller. This study hence sought to find out if the respondents would prefer to live in rural area and practice Agriculture. The results are as illustrated in Table A₁. Data collected before SAEP showed that 10.4% of the participants in the experimental group strongly disagreed to the opinion that they can live in rural area and practice Agriculture, 17.7% disagreed while just 4.2% were undecided. More than a half (55.2%) of the respondents agreed while another 12.5% strongly agreed that they can live in rural area and practice Agriculture. After the SAEP initiative, no respondents in the experimental group strongly disagreed, disagreed, or were undecided on the opinion that they can live in rural area and practice Agriculture. Majority (62.5%) agreed and another 37.5% strongly agreed that they can live in rural area and practice Agriculture, giving a moderate pre-test score of 3.55 and a very high post-test score of 4.38 for those taking part in the SAEP venture.

In the group not involved in SAEP, 14.6% strongly disagreed, 10.4% disagreed, 7.8% were undecided, and 40.1% agreed while just less than a third (27.1%) strongly agreed that they can live in rural area and practice Agriculture. In the post-test, 13.0% of the respondents in the control group strongly disagreed, 12.0% disagreed, 9.4% were undecided, 40.6% agreed with a quarter (25%) strongly agreeing that they can live in rural area and do agricultural activities, an indication of 3.55 and 3.53 pre-test and post-test scores respectively. The experimental group consequently showed a higher post-test score associated with this exposure while for the control group that did not take in SAEP, the pre-test and post-test means showed very minimal variation.

I Have Personal Interest in the Subject and Working on the Farm in General

The respondents were asked to indicate if they have personal interest in Agriculture and farm work and the results are as illustrated in Table A₁. In the period before SAEP, 16.1% of the participants in the experimental group strongly disagreed to the opinion

that they have personal interest in Agriculture and farm work. Another 16.1% disagreed while just 40.1% were undecided. Furthermore, 14.6% of the respondents agreed while another 13.0% strongly agreed that they have personal interest in Agriculture and farm work. After the SAEP, none of the respondents in the experimental group strongly disagreed, disagreed, or were undecided they have personal interest in Agriculture and farm work. Half of them (50.0%) agreed and another half (50.0%) strongly agreed that they have personal interest in Agriculture and farm work. This showed a moderate pre-test score of 3.18 and a very high post-test score of 4.50 for those involved in SAEP venture.

For the SAEP none-participants, 29.2% strongly disagreed that they have personal interest in Agriculture and farm work. It is seen also that 8.3% disagreed, 6.8% were undecided, and a third (33.3%) agreed while 22.4% strongly agreed that they have personal interest in Agriculture and farm work. Post-test data showed that 29.2% of the respondents in the control group strongly disagreed, 8.3% disagreed, 6.8% were undecided, 33.3% agreed with 22.4% strongly agreeing that they have personal interest in Agriculture and farm work, an indication of no change in pre-test and post-test means at 3.11. The experimental group consequently showed a higher post-test score associated with this exposure while for the control group that did not take in SAEP, the pre-test and post-test means showed very no change in the group means.

Working in the Farm is not a Dirty Job for Me

The respondents were asked to express their attitude about farm work by indicating if farm work is dirty and the results are as illustrated in Table A₁. In the period before SAEP, many respondents (42.2%) in the experimental group strongly disagreed that farm work is not a dirty job, majority (52.6%) disagreed while just 2.1% were undecided. Furthermore, 3.1 of the respondents agreed while none of them strongly agreed that farm work is not a dirty job. After the respondents had taken part in SAEP, majority (94.3%) of them strongly disagreed that farm work is a dirty job, 3.6% disagreed and 0.5% were undecided that farm work is not a dirty job. Another 1.6% agreed and none of them strongly agreed that farm work is not a dirty job. This was a very low pre-test score of 1.66 and a very low post-test score of 1.09 for those involved in SAEP venture.

For the group not taking part in SAEP, 72.4% strongly disagreed that farm work is not a dirty job. It is seen also that 13.5% disagreed, 8.3% were undecided, and 4.2% agreed while only 1.6% strongly agreed that farm work is not a dirty job. Post-test results revealed that there was a small change in students' attitude towards the idea that farm work is not a dirty job with post-test percentages of 72.4% strongly disagreeing that farm work is a dirty job. It is seen also that 14.1% disagreed, 8.3% were undecided, and 3.6% agreed while only 1.6% strongly agreed that farm work is not a dirty job, giving mean scores of 1.49 and 1.48 for pre-test and post-test respectively. It can be said therefore that the experimental group had a higher increase in the post-test score associated with this exposure while for the control group that did not take in SAEP, the pre-test and post-test means showed little change in the group means before and after.

Testing of Hypothesis on Students' Attitude towards Practical Agriculture

The second objective of the study was to find out the difference in attitude towards practical Agriculture between secondary school Agriculture students exposed to SAE and those not exposed to SAE. To measure this objective, a null hypothesis was formulated. The second null hypothesis stated that there is no statistically significant difference in attitude towards practical Agriculture between secondary school Agriculture students exposed to SAE and those not exposed to SAE. To test the hypothesis, a one-way ANOVA, a paired sample t-test and an independent sample t-test were computed at 95% confidence level. The results are presented in Tables 2, 3, 4 and 5.

Mean Index of Student's Attitude in Practical Agriculture

There were 15 test items used to measure the student's attitude towards practical Agriculture. The mean index score from these items can be summarised as shown in Table 2.

Table 2. Group Statistics for Change Attitude towards Practical Agriculture

Category	Indicator	n	Group statistics		
			Mean	Std. Deviation	Std. Error mean
Experimental	Attitude towards practical Agriculture before SAEP	192	3.2152	.71001	.05124
	Attitude towards practical Agriculture after SAEP	192	4.2793	.38122	.02751
	Mean Difference (Change in attitude)		1.0641	-.32879	
Control	Attitude towards practical Agriculture before SAEP	192	3.2510	.69780	.05036
	Attitude towards practical Agriculture after SAEP	192	3.2533	.69740	.05033
	Mean Difference (Change in attitude)		.00228	-.0004	

As can be seen from Table 2, the experimental group had a mean of 3.21 ($SD = 0.71$) and a standard error of the mean of .05 in Agriculture before the SAEP. This mean is interpreted as moderate. However after the SAEP, the group had a mean of 4.28 ($SD = 0.11$) and a standard error of the mean of .01 in Agriculture content knowledge. This mean is interpreted as very high. For the control group, mean of 3.25 ($SD = 0.70$) and a standard error of the mean of .05 in Agriculture before the SAEP were reported. This mean is also interpreted as moderate. After the SAEP, this group had a mean of 3.25 ($SD = 0.70$) and a standard error of the mean of .05 of attitude in practical Agriculture. This mean is interpreted as moderate. It can be said therefore that the students who took

part in SAEP had a bigger increase in attitude towards practical Agriculture than those who did not take part. It can also be seen that the control group had a higher standard deviation and a higher standard error of the mean, showing that the control group was more spread out in knowledge than experimental group and with a higher variability. This concurs with the findings of the study by Baliyan and Nenty (2015) which looked at the factors underlying the attitude of secondary schools in Botswana towards Agriculture and gave a recommendation that the attitude of students towards Agriculture can be improved by using encouragement and motivation strategies including allowing students to take part in practical self-owned agricultural activities in schools. This is also supported by Chukwudum and Ogbuehi (2013) who looked at the school farm as an instructional initiative to develop interest among primary school children in Nigeria and concluded that the school farm gives agricultural orientation to children especially the ones lacking agricultural background and increases learners' interest and attitude in the subject. It went ahead to recommend that all schools should have operational crop and livestock farms which for primary use in teaching.

One-Way ANOVA Test for Differences in Attitude towards Practical Agriculture

One-way ANOVA test was conducted to show if there were significant differences within the groups and to identify the group with significant increase in attitude towards practical Agriculture. The results are shown in Table 3.

Table 3. Post SAEP ANOVA Results for Equality of Means for Attitude in Practical Agriculture

		Sum of Squares	df	Mean Square	F	Sig.
Experimental	Between Groups	.014	7	.002	1.972	.061
	Within Groups	.184	184	.001		
	Total	.194	191			
Control	Between Groups	10.094	7	1.442	1.880	.075
	Within Groups	82.803	184	.450		
	Total	92.897	191			

Data for the experimental group showed that the 24 respondents from each school had these means: Masara had an attitude mean of 4.26 ($SD = 0.04$); Nyango 4.22 ($SD = 0.01$); Sori 4.15 ($SD = 0.04$); Nyamome 3.94 ($SD = 0.00$); Tuk Jowi 4.26 ($SD = 0.00$); Agenga 3.98 ($SD = 0.00$); Kubweye 3.95 ($SD = 0.05$); Nyamuga 4.27 ($SD = 0.02$). The difference in attitude towards practical Agriculture therefore, was insignificant, $F(7, 184) = 1.97, p = .064$.

In the control group, the 24 respondents from Abwao had a mean in attitude of 3.25 ($SD = 1.07$); Kakrao had 3.23 ($SD = 0.58$); Akala had a mean of 3.23 ($SD = 0.57$); Moi Suba had a mean of 3.23 ($SD = 0.57$); Bishop Okinda had a mean of 3.23 ($SD = 0.57$); Onyalo had an average of 3.19 ($SD = 0.70$); Nyarach had a mean of 3.26 ($SD = 0.57$);

Nyikendo had a mean of 3.28 ($SD = 0.57$). The difference in attitude towards practical Agriculture among schools therefore, was insignificant, $F(7, 184) = 1.88, p = .082$. These findings confirm that the eight schools in each group had means that were not statistically different.

Paired Sample T-test for Group Differences in Attitude towards Practical Agriculture

An independent sample-test test was conducted to show the level of differences in attitude towards practical Agriculture by comparing pre-SAEP and post-SAEP means in each group. The results are shown in Table 4.

Table 4. Paired Sample T-test Results for the Differences in Attitude towards Practical Agriculture between Experimental and Control Groups

		Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Experimental	Attitude before average – attitude after average	1.06413	-.94189	-.06798	1.19821	191	.000
Control	Attitude before average – attitude after average	.00228	-.02508	-.00181	1.259	191	.210

From Table 4, it can be reported that the group taking part in SAEP had a larger positive change in the mean in attitude towards practical Agriculture compared to their control group counterparts giving pre-SAEP and post-SAEP mean differences of 1.06 and 0.00 respectively. The experimental group mean increase in attitude was therefore statistically significant, $t(191) = 1.20, p = .001.$, while for the control group, the increase was not statistically significant, $t(191) = 1.26, p = .210$.

Independent Sample T-test for Differences in Attitude towards Practical Agriculture between Experimental and Control Groups

To determine if there were differences in attitude towards practical Agriculture between the two study groups, an independent sample t-test was done and the results are as shown in Table 5.

Table 5. Independent Sample T-test for the Differences in Attitude towards Practical Agriculture

		t-test for Equality of Means				
		t	Df	Sig. (2-tailed)	Mean Diff.	Std. Error Diff.
Overall attitude before SAEP	Equal variances assumed	-.498	382	.618	-.03581	.07185
	Equal variances not assumed	-.498	381.885	.618	-.03581	.07185
Overall attitude after SAEP	Equal variances assumed	17.888	382	.000	1.02604	.05736
	Equal variances not assumed	17.888	295.785	.000	1.02604	.05736

As can be seen from Table 5, pre-SAEP independent sample t-test revealed that the group means for experimental ($M = 3.22$, $SD = 0.71$) and control ($M = 3.25$, $SD = 0.69$) groups were not statistically different on the attitude towards practical Agriculture, $t(382) = 0.50$, $p = .622$. Post-SAEP t-test revealed that there was a statistically significant difference in students' attitude towards practical Agriculture between the experimental and control groups ($M = 4.28$, $SD = 0.38$ & $M = 3.25$, $SD = 0.701$ respectively), $t(295.79) = 17.89$, $p = .001$. There was a statistically significant difference in attitude towards practical Agriculture between students taking part and those not taking part in the programme. Therefore, the null hypothesis that there is no statistically significant difference in attitude towards practical Agriculture between secondary school Agriculture students exposed to SAEP and those not exposed to SAEP is rejected.

CONCLUSION

The study concluded that when students taking Agriculture were taught through SAEP, they had a more positive attitude in doing practical Agriculture. SAEP therefore positively influenced student's attitude towards practical Agriculture.

FUTURE RESEARCH

The study revealed that when students take part in hands-on activities, their attitude towards practical agriculture increased. However, practical agriculture is not done in most schools visited during the study hence more studies should be done to ascertain why schools do not embrace this.

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Appendix A: Data results for the learning outcome test**Table A1. Data on Attitude towards practical Agriculture**

Timing	Category	Question and Score										Total	Mean	
		SD		D		U		A		SA				
		f	%	f	%	f	%	f	%	f	%	f	%	
		Question: Agriculture is the simplest and most basic among the school subjects												
Pre-experiment	Experimental	2	1.0	25	13.0	13	6.8	100	52.1	52	27.1	192	100.0	3.9115
	Control	7	3.6	14	7.3	17	8.9	54	28.1	100	52.1	192	100.0	4.1771
Post-experiment	Experimental	0	0.0	0	0.0	120	62.5	0	0.0	72	37.7	192	100.0	3.7500
	Control	7	3.6	11	5.7	17	8.9	54	28.1	103	53.6	192	100.0	4.1667
		Question: Agriculture subject is effective to students of differing abilities and levels												
Pre-experiment	Experimental	17	8.9	34	17.7	23	12	98	51	20	10.4	192	100.0	3.3646
	Control	44	22.9	29	15.1	45	23.4	44	22.9	30	15.6	192	100.0	2.9167
Post-experiment	Experimental	0	0.0	0	0.0	0	0.0	120	62.5	72	37.5	192	100.0	4.3750
	Control	40	20.9	30	15.6	46	24.0	45	23.4	31	16.1	192	100.0	2.9115
		Question: Agriculture subjects is more suited for boys than girls												
Pre-experiment	Experimental	46	24.0	37	19.3	83	43.2	13	6.8	13	6.8	192	100.0	2.5313
	Control	86	44.8	31	16.1	29	15.1	24	12.5	22	11.5	192	100.0	2.2708
Post-experiment	Experimental	0	0.0	0	0.0	26	13.5	96	50.0	70	36.5	192	100.0	4.2292
	Control	83	43.2	31	16.1	28	14.6	28	14.6	22	11.5	192	100.0	2.3490
		Question: Secondary school Agriculture prepares students with practical skills needed for the future												
Pre-experiment	Experimental	9	4.7	31	16.1	77	40.1	32	16.7	43	22.4	192	100.0	3.3594
	Control	19	9.9	21	10.9	13	6.8	62	32.3	77	40.1	192	100.0	3.7813
Post-experiment	Experimental	0	0.0	0	0.0	0	0.0	120	62.5	72	37.5	192	100.0	4.3750
	Control	19	9.9	23	12.0	23	12.0	60	31.3	67	34.9	192	100.0	3.6927
		Question: I find Agriculture field practices appropriate to the learners												
Pre-experiment	Experimental	14	7.3	95	49.4	12	6.3	38	19.8	33	17.2	192	100.0	2.9010
	Control	30	15.6	11	5.7	12	6.3	82	42.7	57	29.8	192	100.0	3.7292
Post-experiment	Experimental	0	0.0	0	0.0	0	0.0	120	62.5	72	37.5	192	100.0	4.3750
	Control	20	10.4	11	5.7	12	6.3	82	42.7	57	29.7	192	100.0	3.7448
		Question: The climatic conditions in my school affect the teaching and learning of Agriculture												
Pre-experiment	Experimental	27	14.1	41	21.4	10	5.2	93	48.4	21	10.9	192	100.0	3.2083
	Control	62	32.3	37	19.3	18	9.4	39	20.3	36	18.8	192	100.0	2.7135
Post-experiment	Experimental	0	0.0	0	0.0	2	1.0	98	51.0	92	47.9	192	100.0	4.4688
	Control	62	32.3	37	19.3	19	9.9	40	20.8	34	17.7	192	100.0	2.7240

		Question: Students in Form Three willingly choose/select Agriculture as a study subject												
Pre-experiment	Experimental	12	6.3	100	52.1	10	5.2	44	22.9	26	13.5	192	100.0	2.8542
	Control	25	13.0	19	9.9	17	8.9	84	43.8	47	24.5	192	100.0	3.5052
Post-experiment	Experimental	0	0.0	0	0.0	6	3.1	99	51.6	87	45.3	192	100.0	4.4219
	Control	25	13.0	19	9.9	19	9.9	83	43.2	46	24.0	192	100.0	3.5521
		Question: Practising and working on the farm is necessary for a career in Agriculture												
Pre-experiment	Experimental	19	9.9	103	53.6	13	6.8	36	18.8	21	10.9	192	100.0	2.6719
	Control	33	17.2	19	9.9	29	15.1	70	36.5	41	21.4	192	100.0	3.3490
Post-experiment	Experimental	0	0.0	0	0.0	2	1.0	96	50.0	94	49.0	192	100.0	4.4792
	Control	33	17.2	20	10.4	33	17.2	66	34.4	40	20.8	192	100.0	3.3125
		Question: Most careers in Agriculture do not involve a great amount of manual labour												
Pre-experiment	Experimental	27	14.1	33	17.2	13	6.8	34	17.7	85	44.3	192	100.0	3.6094
	Control	51	26.6	15	7.8	23	12.0	68	35.4	35	18.2	192	100.0	3.1094
Post-experiment	Experimental	0	0.0	0	0.0	0	0.0	0	0.0	192	100.0	192	100.0	5.0000
	Control	51	26.6	15	7.8	27	14.1	64	33.3	35	18.2	192	100.0	3.0885
		Question: I can define practical agricultural education and training and provide an example												
Pre-experiment	Experimental	14	7.3	28	14.6	10	5.2	43	22.4	97	50.5	192	100.0	3.9427
	Control	21	10.9	15	8.3	21	10.9	87	45.3	47	24.5	192	100.0	3.6406
Post-experiment	Experimental	0	0.0	0	0.0	0	0.0	0	0.0	192	100.0	192	100.0	5.0000
	Control	18	9.4	16	8.3	25	13.0	85	44.3	48	25.0	192	100.0	3.6719
		Question: Agriculture farm work contributes positively to the economy of our country												
Pre-experiment	Experimental	20	10.4	28	14.6	11	5.7	95	49.5	38	19.8	192	100.0	3.5365
	Control	30	15.6	10	5.2	23	12.0	61	31.8	68	35.4	192	100.0	3.6615
Post-experiment	Experimental	0	0.0	0	0.0	0	0.0	120	62.5	72	37.5	192	100.0	4.3750
	Control	29	15.1	13	6.8	26	13.5	62	32.3	62	32.3	192	100.0	3.5990
		Question: I would prefer to live in rural area and practice Agriculture												
Pre-experiment	Experimental	20	10.4	34	17.7	8	4.2	106	55.2	24	12.5	192	100.0	3.4167
	Control	28	14.6	20	10.4	15	7.8	77	40.1	52	27.1	192	100.0	3.5469
Post-experiment	Experimental	0	0.0	0	0.0	0	0.0	120	62.5	72	37.5	192	100.0	4.3750
	Control	25	13.0	23	12.0	18	9.4	78	40.6	48	25.0	192	100.0	3.5260
		Question: I have personal interest in the subject and working on the farm in general												
Pre-experiment	Experimental	31	16.1	31	16.1	77	40.1	28	14.6	25	13.0	192	100.0	3.1823
	Control	56	29.2	16	8.3	13	6.8	64	33.3	43	22.4	192	100.0	3.1146
Post-experiment	Experimental	0	0.0	0	0.0	0	0.0	96	50.0	96	50.0	192	100.0	4.5000
	Control	56	29.2	16	8.3	13	6.8	64	33.3	43	22.4	192	100.0	3.1146
		Question: Working in the farm is not a dirty job for me												

Pre-experiment	Experimental	81	42.2	101	52.6	4	2.1	6	3.1	0	0.0	192	100.0	1.6615
	Control	139	72.4	26	13.5	16	8.3	8	4.2	3	1.6	192	100.0	1.4896
Post-experiment	Experimental	181	94.3	7	3.6	1	.5	3	1.6	0	0.0	192	100.0	1.0938
	Control	139	72.4	27	14.1	16	8.3	7	3.6	3	1.6	192	100.0	1.4792