

TECHNICAL SKILLS REQUIRED IN COCOA PRODUCTION BY SENIOR SECONDARY STUDENTS FOR PROMOTING FOOD SECURITY

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ABSTRACT: *This study was carried out to determine the extent of technical skills acquired in cocoa production by senior secondary students for promoting food security in Cross River State. The study adopted survey research design. Four purposes of study and four corresponding research questions, as well as two hypotheses guided the study. The instrument used for the study was a structured questionnaire which has four points rating scale of Highly Acquired (HA), Acquired(A) Rarely Acquired(RA) and Not Acquired (NA) with their nominal values of 4,3,2, and 1 respectively. The instrument which contains 27 items was validated by three experts from the university of Calabar. The specialists' observations and corrections were incorporated at the final stage of the production of the instrument. The reliability of the instrument was determined by using cronbach alpha to analyse the result of the preliminary test, and 0.92 was obtained as the reliability coefficient. The data collected with the instrument were analysed using mean and standard deviation for the research questions while t-test was used to test the hypotheses formulated. The result of the analysis revealed that the senior secondary students of agricultural science in Cross River State acquired technical skills in pre-planting operations, post-planting operations as well as harvesting and post-harvesting operations. On the basis of the findings, the following recommendations among others were that in the teaching of crop production the teachers should lay more emphasis on those skills in cocoa production that the students do not have.*

KEYWORDS: Technical skills, cocoa production, food security.

INTRODUCTION

There is a high level of unemployment in Nigeria among the graduates (Okoro,2006). Ozoro in Okoro (2006) reported that the graduates unemployment could be attributed to lack of saleable technical skills and knowledge that will enable them take up the jobs that are available. He further explained that graduates who possess skills have many jobs waiting for them, especially in agricultural sector. Nigeria is agrarian society and as such needs people who possess technical skills in the area of agriculture in order to take up jobs in agro industries. In Nigeria, farmers produce food crops such as rice, cassava, maize, yam, potato, and many others as well cash crops

like cocoa, coffee, palm oil and kernel, coconut and many others. These crops require special skills for their production.

Allen (2000) defined skill as a special ability in a particular field, especially acquired by learning and practice. Delacroix (2000) explained skill as the ability to do something well after learning and practicing it. Turnbull (2010) stated that skill is the ability to do something well.

According to Okeme (2014), skill is a well established habit of performing task in a manner acceptable in a particular profession. Ben (2010) explained skills as ability and capacity acquired through deliberate systematic and sustained effort. Skill is the manifestation of acquired knowledge, it is a knowledge that is translated into practical use. In the context of this study; skill means the ability to do anything well and expertly. Technical skill on the other hand is referred to as the knowledge and abilities needed to accomplish mathematical, engineering, scientific or computer-related activities or duties, as well as other specific task (Beatrice and Owusu, 2002). They further explained that technical skill is a talent and expertise a person possess to perform a certain job or task. Technical skills are the knowledge and capabilities to perform specialized task. In another way, it is referred to as the skills that is required for the accomplishment of a specific task. Technical skills need to be developed in individual for performance of specific tasks. Technical skills are very important for a nation's natural resource and for promoting economic stability. The wealth of a society is determined to a large extent by the development of technical skills in such a society. The behavior of a nation in the comity of nations may be influenced by the technical skills possessed by that nation. It is also important for its agricultural values, because most of the agricultural machines require some level of technical-know-how in their operations (Ben, 2010). Technical skills are required for proficiency in almost all areas of agricultural production and should be identified and emphasized during training. Technical skills are required by the senior secondary students for production of crop such as cocoa. Anochili (2010) identified the following technical skills in cocoa production such as skills in site selection, skills in pre-planting operations, skills in post-planting operations, skills in harvesting, processing, preservation and storage.

The agricultural science teachers train the students on the production of crops such as cocoa and others. The teachers expect that on graduation, the students should be able to acquire adequate skills in cocoa production. Cocoa belongs to the family of *Malvaceae* and genus is *theobroma*. Cocoa was discovered in the 18th century at the Amazon basin and later spread to other tropical areas of South America and West Africa (Opeke, 2007). The cocoa trees seldom reach a height of 7.5 meters. To flourish well, it needs to be shaded from direct effect of the sun and wind velocity particularly in the early growth stages. The cocoa tree has broad dark leaves about 25cm long and pale in colour.

Cocoa can be cultivated in many tropical locations around the world now. (Falusi, 2010). Cocoa (*Theobroma cocoa*) was introduced into Nigeria from the American continent in 1874 and was first planted in Cross River State, but commercial planting began when the crops was re-introduced into western Nigeria. (Opeke, 2007). Cocoa farming gained prominence in Nigeria in

1965, by then Nigeria was recognized as the largest producer of cocoa world wide. According to Amalu (2000), Nigeria is the fourth largest producer of cocoa world wide, after Cote D'voire, Brazil and Ghana. In Nigeria, Etung Local Government Area in Cross River State is the second highest producer of cocoa which made it possible for the federal government to establish cocoa research institute of Nigeria at Ajassor in Etung Local Government Area in Cross River State. Etung in Cross River State ranks the second largest producer of cocoa after Ondo State in Nigeria. Cross River State produces not less than 30,000,00 kilogram of cocoa annually which is the best grade in the world in terms of flavor and quality (Amalu, 2000). Cocoa is one of the main cash crops exported to earn foreign exchange in Nigeria. Cocoa production provides employment opportunity and generates income for the up keep of the farmer and his family. Cocoa is used to produce numerous consumer products. However, the decline in cocoa production was attributed to the discovery and exploitation of petroleum in the 1970s. Nigeria has for years over depended on the exploitation of crude oil as a main source of foreign exchange earnings and thereby neglecting agriculture as a versatile renewable and sustainable avenue for generating foreign exchange and employment (Nwuzor,2009). Among other factors responsible for the decline in cocoa production in Nigeria and Cross River State in particular is the gap created by the extermination of cocoa marketing board, old age of cocoa farmers, rural-urban drift by the youths who would have been cocoa farmers, high cost of farm labour and most importantly lack of technical skill, (Nwuzor,2009).

Cocoa production is one way to enhance food security, Food security is explained as a condition of assuring the availability of food, price stability of basic food stuffs at the local, national and international levels. Furthermore, Food and Agricultural Organisation (FAO) (2006) reported that food security is a situation when all people at all times have both physical and economic access to the basic food that they need. In the context of this study, food security is conceptualized as a situation whereby every individual at all times have physical and economic access to the right type, sufficient and nutritious food that meets their dietary needs for a healthy life. Realizing the importance of agriculture in the economy of Nigeria, the Federal Republic of Nigeria under the auspices of Comparative Education Study and Adaptation Centre (CESAC, 1985) incorporated Agricultural Science in the curriculum of secondary schools with the aim of developing technical skills in crop and animal production.

Cocoa is one of the crops being studied at the senior secondary school. The students who offer Agricultural Science should be able to show possession of technical skills in cocoa production. This expectation is based on the general objectives of agricultural science in senior secondary schools curriculum which includes; to stimulate and sustain students interest in agriculture, to enable students acquire useful knowledge and practical technical skills in agriculture, to prepare students for further learning in agriculture and to prepare students for occupation in agricultural science (CESAC, 1985). It is expected that the students should be able to produce at least two crops and also rear two animals of their choices. Then, through close observation, it appears that the senior secondary school graduates cannot manage cocoa farm due to lack of technical skills required in the establishment and management of cocoa. The need arises for identifying the

technical skills required in cocoa production by the senior secondary schools students in Cross River State for promoting food security.

Statement of the Problem

Nigeria is the fourth largest producer of cocoa in the world after Cote' voire, Brazil and Ghana and Cross River State ranked the second largest producer of cocoa after Ondo State in Nigeria, (Andrew, 2009). However, realizing the importance of agriculture in the economy of Nigeria, the Federal Republic of Nigeria, under the auspices of Comparative Education Study and Adaptation Committee (CESAC, 1985) incorporated Agricultural Science in the curriculum of secondary schools with the aim of developing technical skills in crops and animal production. Cocoa is one of the crops being studied at the senior secondary school level. Therefore, it is expected that the senior secondary school students who offer Agricultural Science should be able to show possession of technical skills in cocoa production on graduation. Students, on graduation from secondary school should be able to produce at least two crops and also rear two animals of their choices; but through close observation, it appears that the senior secondary school graduates cannot manage cocoa farm due to lack of technical skills required to enable them establish cocoa farms and manage it. It is on the basis of these that it becomes necessary to identify the technical skills acquired in cocoa production by the senior secondary school students in Cross River State.

Purpose of the Study

The main purpose of the study is to determine the extent of technical skill acquired in cocoa production by the students of agricultural science in senior secondary schools in Cross River State for promoting food security. Specifically the study sought to

- i. determine the technical skills acquired in pre-planting operation in cocoa production by the SS III students for promoting food security;
- ii. determine the technical skills acquired in planting operations in cocoa production by the SS III students for promoting food security;
- iii. determine the technical skills in post planting operations in cocoa production; and
- iv. determine the technical skill acquired in harvesting and post-harvesting operation in cocoa production for promoting food security.

Research Questions

The following research questions guided the study

1. To what extent are technical skills acquired by secondary school students in pre-planting operations in cocoa productions for promoting food security?
2. To what extent are technical skills acquired by secondary school students in planting operations in cocoa production for promoting food security?
3. To what extent are technical skills acquired by secondary school students in post-planting operation cocoa production by the SSIII students for promoting food security?
4. To what extent have the students acquired the technical skills in harvesting and post-harvesting operation in cocoa production?

Hypotheses

The following hypotheses were tested in the course of the study.

H0₁: There is no significant difference between the mean ratings of the agricultural science students and agricultural science teachers on the technical skills required in pre-planting operation in cocoa production for promoting food security.

H0₂: There is no significant difference between the mean ratings of the agricultural science students and agricultural science teachers on technical skills in post-planting operation in cocoa production for promoting food security.

METHODOLOGY

The study adopted a survey research design; and was carried out in Cross River State of Nigeria. Cross River is one of the 36 states in Nigeria and situated in the south-south geo-political zone in Nigeria with Calabar as its headquarters. The state comprises of three(3) senatorial districts (Cross River south, central and north). The state has eighteen local government areas.

The population for the study was 723 which comprised of 21 agricultural science teachers and 402 senior secondary school (SS III) students in public secondary schools in Cross River State. A total of 402 students were randomly sampled while all the 21 agricultural science teachers were used for the study. Therefore, the sample for the study was 423. A structured questionnaire was used as the instrument for data collection. The questionnaire which contained 28 items were constructed on four points rating scale of highly acquired (HA), acquired(A), rarely acquired, and not acquired (NA) with their nominal values as 4,3,2 and 1 respectively.

The reliability of the instrument was determined by carrying out a pilot study using 20 agricultural science teachers and 25 SS III students. The data collected were analyzed using cronbach alpha to determine the internal consistency of the items which yielded 0.92. The data for the study were collected by the researchers by administering the instruments to the respondents. A total of 423 questionnaire were administered while 408 were retrieved which represents 96.45% retrieval. All the data collected were analysed using mean statistics and standard deviation for the research questions and the hypotheses formulated were tested using t-test statistics. In taking decision, a cut off point of 2.50 was used as bench mark for decision making. Any item in the questionnaire with mean score of 2.50 and above was regarded as the skills acquired by the senior secondary students in cocoa production and any item with the mean score less than 2.50 was regarded as skills not acquired by the senior secondary students in cocoa production. In testing the hypothesis, the t-calculated was compared with t-table and if the t-calculated was less than the t-critical value, the null hypothesis was accepted and if the t-calculated was greater than the t-critical, the null-hypothesis was rejected at 0.05 level of significance.

RESULTS AND DISCUSSION

Research question 1: What are the technical skills in pre-planting operation in cocoa production acquired by the senior secondary students for promoting food security?

Table 1: Mean ratings and standard deviation of the respondents on technical skills acquired in pre-planting operations in cocoa production for promoting food security.

SN	Item statements	$\bar{X}$	SD	Remarks
1	Technical skills in site selection for cocoa farm.	1.89	0.94	Not acquired
2	The technical skills in nursery preparation for planting of cocoa seeds	2.93	0.92	Acquired
3	Technical skills in land preparation for planting of cocoa seedlings	2.57	1.15	Acquired
4	Technical skills in selecting appropriate varieties of cocoa seeds for planting.	2.85	0.99	Acquired
5	Technical skills in soil testing to determine the fertility of the soil on the cocoa farm	2.29	0.97	Not Acquired
6	Skills in dressing the cocoa seed before planting	2.84	0.95	Acquired
7	Technical skills in identifying healthy seeds of cocoa for planting	3.04	0.92	Acquired
	Grand mean	2.63	0.97	

The table 1 above revealed that items 2,3,4,6 and 7 had their mean scores above the cut off point which ranged between 2.57 and 2.04 with their corresponding standard deviations, this implies that the respondents agreed that the students acquired the technical skills in pre-planting operations those items but items 1 and 5 had their mean score below the cut-off point. This implies that the respondents disagreed with the two items on selection and determination of fertility of the soil.

Research question 2: What are technical skills in planting operation in cocoa production acquired by the senior secondary students for promoting food security?

Table 2: Mean ratings and standard deviation of the respondents on technical skills acquired in planting operations in cocoa production for promoting food security.

SN	Item statements	$\bar{X}$	SD	Remarks
1	Technical skills in inter-cropping of cocoa with other crops.	2.75	1.03	Acquired
2	Technical skills in marking of the planting holes	2.65	0.99	Acquired
3	Technical skills in determining the depth of planting of cocoa seeds	2.76	0.98	Acquired
4	Technical skills in determination of planting distance of cocoa on the field.	2.69	1.01	Acquired
5	Technical skills in seed rate determination in cocoa planting	2.68	1.07	Acquired
6	Technical skills in the replacement of vacancies after planting.	2.64	1.03	Acquired
	Grand mean	2.69	1.01	

Table 2 above revealed that all the items had their mean scores above the cut –off point of 2.50 with their corresponding standard deviations. This signifies that the respondents agreed that the students acquired technical skills in planting operations in cocoa production.

Research question 3: What are the technical skills in post-planting operation in cocoa production acquired by the senior secondary students for promoting food security?

Table 3: Mean ratings and standard deviation of the respondents on technical skills acquired in post-planting operations in cocoa production for promoting food security

SN	Item statements	$\bar{X}$	SD	Remarks
1	Technical skills in mulching the cocoa seedlings after planting.	3.31	1.05	Acquired
2	Technical skills in provision of shade for the young cocoa seedlings	3.10	0.87	Acquired
3	Technical skills in pruning of the cocoa plant.	3.09	0.89	Acquired
4	Technical skills in pests and disease control of cocoa.	2.86	1.19	Acquired
5	Technical skills in mixing and spraying agro-chemicals on the cocoa plants.	2.56	0.97	Acquired
6	Technical skills in determining fertilizer type to be applied to the cocoa plant.	2.88	0.93	Acquired
7	Technical skills in applying fertilizer using appropriate methods	2.91	1.08	Acquired
	Grand mean	2.95	0.99	

Table 3 showed that all the items had their mean scores above the cut-off point of 2.50 with their corresponding standard deviations ranging between 0.87 and 1.19. This showed that the senior

secondary schools students required the technical skills in planting operations in cocoa production.

Research question 4: What are the technical skills in harvesting and post-harvesting operation in cocoa production acquired by the senior secondary students for promoting food security?

Table 4: Mean ratings and standard deviation of the respondents on technical skills acquired in harvesting and post-harvesting operations in cocoa production for promoting food security.

SN	Item statements	$\bar{X}$	SD	Remarks
1	Technical skills in recognizing matured and ripe cocoa pod	3.26	0.97	Acquired
2	Technical skills in harvesting cocoa using appropriate techniques.	2.89	1.11	Acquired
3	Technical skills in breaking cocoa pods	2.93	0.92	Acquired
4	Technical skills in fermentation of cocoa seeds.	2.90	1.03	Acquired
5	Technical skills in determining appropriate fermentation method	2.83	1.12	Acquired
6	Technical skills in drying of cocoa seeds	3.01	1.01	Acquired
7	Technical skills in winnowing to remove debris from the cocoa seeds.	2.83	1.12	Acquired
	Grand mean	2.95	1.04	

Table 4 above revealed that all the items in the table had their mean scores above the cut-off point of 2.50 with their corresponding standard deviations. This implies that the respondents agreed that the students acquired the technical skills in harvesting and post-harvesting of cocoa in cocoa production.

Table 5: t-test analysis of the mean responses of the students and the teachers on technical skills acquired in post-planting operations in production for promoting food security in Cross River State.

SN	Item statements	Students $\bar{X}$ S^2_1	Teachers $\bar{X}$ S^2_1	t-cal	t-critical	Interpretation
1	Technical skills in mulching the cocoa seedlings.	3.31 0.83	3.14 0.91	-0.39	1.96	*
2	Technical skills in provision shade for the young cocoa seedlings	3.10 1.05	2.90 0.82	0.43	1.96	*
3	Technical skills pruning of the cocoa plant.	3.09 0.75	2.59 0.85	0.49	1.96	*
4	Technical skills in pests and disease control of cocoa.	2.86 0.97	2.76 1.41	0.75	1.96	*
5	Technical skills in mixing and spraying agro-chemicals on the cocoa plants.	2.56 0.75	3.28 0.95	-6.89	1.96	*
6	Technical skills in determining fertilizer type to be applied to the cocoa plant.	2.88 0.96	3.00 0.89	-5.23	1.96	*
7	Technical skills in applying fertilizer using appropriate methods	2.91 1.09	2.95 1.07	-0.33	1.96	*

N1 = 387, N2 = 21, *= No significant difference, ** = Significant difference, df = 406

Table 5 above revealed that all the items had their t-calculated less than the t-critical with degree of freedom of 406 at 0.05 level of significance. Therefore, the null-hypothesis was accepted. This signifies that the students and the teachers had the same opinion on the technical skills acquired in post-planting operations in cocoa production for promoting food security in Cross River State.

Table 6: t-test analysis of the mean responses of the agricultural science teachers and students on technical skills acquired in pre-planting operations in cocoa production for promoting food security in Cross River State.

SN	Item statements	Students $\bar{X}$ S^2_1	Teacher s $\bar{X}$ S^2_1	t-cal	t-critical	Interpretation
1	Technical skills in site selection for cocoa farm.	1.84 1.02	1.95 0.86	-0.57	1.96	*
2	The technical skills in nursery preparation for planting of cocoa seeds	3.06 0.75	2.80 1.08	0.13	1.96	*
3	Technical skills in land preparation for planting of cocoa seedlings	2.72 1.19	2.66 1.15	-6.84	1.96	*
4	Technical skills in selecting appropriate varieties of cocoa seeds for planting.	3.05 0.70	2.85 1.06	0.14	1.96	*
5	Technical skills in soil testing to determine the fertility of the soil on the cocoa farm	3.08 0.91	2.14 1.10	2.79	1.96	*
6	Skills in dressing the cocoa seed before planting	3.19 0.97	2.90 0.88	1.21	1.96	*
7	Technical skills in identifying healthy seeds of cocoa for planting	2.98 1.08	2.80 1.03	0.78	1.96	*

1 = 387, N2 = 21, * = No significant difference, ** = Significant difference, df = 406

Table 6 above revealed that all the items had their t-calculated below the t-tabulated of 1.96 with degree of freedom of 406 at 0.05 level of significant. Therefore, the null hypothesis was accepted. This implies that the opinions of the students did not differ from, that of the teachers on the technical skills acquired in pre-planting operation in cocoa production for promoting food security in Cross River State of Nigeria.

Major Findings

Based on the analysis of the data, the following findings emanated;

1. Students acquired technical skills in pre-planting operations except the skills in site selection and the skills in soil testing to determine fertility of the soil.
2. Students acquired the technical skills in planting operations in cocoa production.
3. Students acquired technical skills in post-planting operations
4. Students acquired technical skills in harvesting and post-harvesting operations in cocoa production.
5. The null-hypotheses formulated were accepted meaning that the opinions of the two groups of respondents, the students and the teachers did not differ in the pre-planting and post-planting operations in cocoa production for promoting food security.

DISCUSSION OF FINDINGS

The work found that the senior secondary students acquired the skills in pre-planting operations, planting operation, harvesting and post harvesting operation; but lacked the skills in site selection and skills in soil testing to determine the fertility of the soil. These findings are in line with (Beatrice and Owusu, 2002) who reported that graduates of secondary schools can confidently establish and manage cocoa farms.

CONCLUSION

This study was carried out in Cross River State using the agricultural science students and agricultural science teachers as the subjects of the study. A survey research was adopted for the study. The study used structured instrument for data collection and the data collected were analysed using mean and standard deviation. The finding revealed that the students possessed the technical skills in pre-planting operations, planting operation, post-planting operations as well as harvesting and post harvesting operations. The study also revealed that the students lack the skills in site selection and testing of the soil to determine the fertility of the soil. This study is concluded by recommending that the government of Cross River State should improve the welfare of the agricultural science teachers in the state in order to motivate the teachers to continue to carryout effective teaching in the school, so that the students will be skillful in not only in cocoa production but in other crops and fields of agriculture.

Recommendations

Based on the findings of the study, the following recommendations are made;

1. The agricultural science teachers should continue to improve on their efforts in teaching the students in order to ensure that students continue to acquire the technical skills in cocoa production.
2. The teachers should drill the students more on the skills in cocoa production in which the students lack.

3. The Cross River State government should ensure that the teachers welfare are taken care of, so that the teachers will continue to do their best in teaching the students.
4. The graduating students of senior secondary schools should be encouraged by the Cross River State government to engage in cocoa production as one of the ways of reducing unemployment and promoting food security in the state.

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