ENTREPRENEURIAL SKILLS NEEDED IN HARVESTING AND MARKETING OF CASSAVA ROOTS FOR SELF-RELIANCE BY SENIOR SECONDARY AGRICULTURAL SCIENCE STUDENTS IN ENUGU STATE

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Abstract

The study focused on the entrepreneurial skills needed in harvesting and marketing of cassava roots (tubers) for self-reliance by senior secondary agricultural science students. The study was carried out in Enugu State, Nigeria using a descriptive survey research method. Two research questions and two null hypothesis guided the study to achieve the purpose of the study. The null hypothesis was tested at 0.05 level of significance at the appropriate degree of freedom. The population of the study consisted of 380 respondents. There was no sampling because the population was manageable. Structured questionnaire were used for data collection made up 25 items. The instrument was validated by three experts and Cronbach Alpha statistics was used to determine the internal consistency of the instrument and a coefficient of 0.87 was obtained. A total of 380 questionnaire was distributed and 362 retrieved and analysed using weighted mean and standard deviation to answer the research questions and t-test and Analysis of Variance was used to test the null hypothesis. The findings of the study revealed among others that secondary agricultural science students need entrepreneurial skills such as harvesting cassava tubers when the roots have not become fibrous, harvesting as the need arises, selling on the spot, determining when to sell etc. in harvesting and marketing of cassava roots in Enugu State. The null hypothesis tested showed that most of the items in null hypothesis 1and 2 were rejected while some were accepted. Based on these findings it was recommended that teachers of agricultural science should use more of demonstration and practical skills in delivering their lessons; regular field trips and excursion to established cassava enterprises should be organised for the students.

Key words: Entrepreneurial Skills, Cassava crop, harvesting, marketing and self-reliance.

Introduction

Cassava (*Manihot spp)* is an important root crop grown in the tropics. This is because it is a major source of carbohydrate both in human and animal food. According to Ubakamma, Ezeani, Eruchalu, and Okafor (2000) there are varieties of cassava plant (cultivars) on each locality where it is grown. The varieties are distinguished on the basis of leaf, shape, size, plant height, flower, colour, tuber shapes, and earliness to maturity, yield and hydrocyanic content. The maturity of cassava plants is shown by shedding of old leaves without new leaves forming. Okafor (2007) noted that early maturing varieties of cassava form edible roots in about nine months and some as early as six months. Okafor maintained that the food quality of the roots particularly the starch content increases with time up to an optimal period of 12 to 15 months after planting after which there is loss of quality mainly due to increased lignification and root (tuber) decay. This is why cassava roots (tubers) should be harvested in time to avoid tuber loss.

Harvesting according to Emone (2005) is the cutting, digging, gathering, and handling of mature cassava roots (tubers) up to their final removal from the field. Iwena (2008) opined that this could be done either manually by the use of cutlass and hoes or mechanically using mechanical harvesters like cassava pullers. In Enugu State which is the study area, cassava roots (tubers) can be harvested by any of these methods. Furthermore, cassava tubers are also harvested when the soil is moist for ease of harvesting and for minimizing damage to the roots (tubers). This is done as the need arises (piece meal) over a period of time since the keeping quality of cassava roots (tubers) after harvesting is poor. In the context of this study, harvesting of cassava is the cutting, digging and gathering of matured cassava tubers with the machete or hoe with the aim of marketing.

Marketing is defined by Ogieva (2003) as the exchange of activities conducted by individuals and organisations for the purpose of satisfying human wants. Asogwa (2010) saw marketing as the sum totals of all business activities that direct the flow of sales of products and services from the producers to the consumers or end users. Such activities include processing, assembling of products, sorting, storage, transportation, grading, and financing of these activities. In the context of this study, due to the perishability of cassava roots and the potential toxicity as a result of the presence of cyanogenic glucocides in many varieties, harvesting of fresh tubers and its marketing is very essential (Okafor & Onuoha, 2010) to ensure that the actual value of cassava tubers are communicated to the consumers. This implies that proper organization and specialised skills are needed not only for the reason of profit marking but also for the perishable nature of cassava roots (tubers).

Skill according to Osinem and Nworji (2005) is the proficiency displayed by someone in the performance of a given task. That is a person's ability in performing a given task as well as a result of training and practice. One of such is the entrepreneurial skills. Entrepreneurial skill is defined by Hisrich and Micheal (2002) as the ability to create something new with value by devoting the necessary time and effort, assuming the accompanying financial and social risks and receiving the resulting rewards of monetary and personal satisfaction and independence. This ability according to Obi and Omeje (2010) involves the acquisition of skills, ideas, managerial competencies necessary for self-employment to

propel and sustain wealth creation. With reference to this study entrepreneurial skill in harvesting and marketing of cassava roots is the acquisition of skills, ideas, and managerial competencies of harvesting of cassava roots (tubers) so as to retain its quality and its marketing to generate income for self-reliance.

Self-reliance according to Leghara and Mba (2009) is the acquisition and development of right habits, attitudes and saleable skills with which one can explore his environment as well as means of surviving in the face of unemployment. It is the ability of one to do or decide things by himself rather than depending on other people for help. With reference to this study, to be self- reliant in harvesting and marketing of cassava products involves the identification of entrepreneurial skills needed in harvesting cassava roots into various products such as cutting, digging, gathering, and handling of matured cassava tubers with machete or hoe, and marketing skills such as processing, assembling, grading, sorting, storage, transportation etc.

In Enugu State which is the study area, harvesting and marketing of cassava products has contributed to the economy of the state and the nation as a whole. As a result, it has made harvesting and marketing of cassava products suitable for self-reliance by senior secondary agricultural science students. In the context of this study, senior secondary agricultural science students are people who are very interested in studying agricultural science at the senior secondary school and has enrolled in agricultural science. These group of students have passed the Basic Certificate Examination (BCE) in junior secondary school and are offering agricultural science as a vocational subject in the senior secondary level.

Agricultural science education according to Alawa, Abanyam, and Okeme (2010), is a programme of instruction systematically organised for learners to acquire knowledge, skills, and attitudes in various aspects of agriculture. In the context of this study, it is the teachers of agricultural science that are charged with the responsibility of imparting agricultural knowledge, skills and attitudes to students in the senior secondary schools. A teacher of agricultural science is one trained in both knowledge and skills as well as methodology of imparting these skills to the students in agricultural science. It is expected that these teachers will equip the students with adequate skills in agricultural science especially in harvesting and marketing of cassava roots (tubers). For these teachers to improve their knowledge in agricultural science especially in cassava harvesting and marketing, they need the assistance of agricultural extension workers.

Agricultural extension workers are trained personnel employed by the government with the aim of disseminating new research information on the improved techniques of farming to farmers, helping them to improve on their farming skills and general welfare, as well as the development of leadership qualities in them (Ugwuoke & Ejiofor, 2010). In the area of the study which is Enugu State, these agricultural extension workers would be of great help in identifying the entrepreneurial skills needed in harvesting and marketing cassava roots (tubers) by senior secondary agricultural science students for self-reliance.

For senior secondary agricultural science students in Enugu State to possess entrepreneurial skills in various activities involved in harvesting and marketing of cassava roots (tubers), what they need to know and be able to do in order to become self-reliant after graduation from school need to be identified. This is because it is expected that senior secondary agricultural science students should acquire enough skills in harvesting and marketing of cassava roots (tubers) as contained in their syllables to take up this enterprise in cassava production after graduation from school. Unfortunately, the teaching method mostly used in senior secondary school agriculture lay much emphasis on the theoretical aspect of harvesting and marketing of cassava roots (tubers) and deprive the students of the practical knowledge that is needed in skill acquisition. This has contributed to most of these students roaming about the streets aimlessly, idling their time, planning and carrying out one crime or the other such as stealing, robbery, drug addiction and peddling while some migrate to the urban areas in search of good paid jobs that are not readily available. Incidentally if these youths were adequately trained to acquire skills especially entrepreneurial skills in harvesting and marketing of cassava roots (tubers), they will become self-reliant as quickly as possible after graduation from school.

The major purpose of the study was to identify entrepreneurial skills needed by senior secondary agricultural science students for self-reliance in harvesting and marketing of cassava roots (tubers) into various products in Enugu State.

Research Questions

The following research questions guided the study:

1. What are the entrepreneurial skills needed by senior secondary agricultural science students for self-reliance in harvesting cassava roots (tubers) in Enugu State.
2. What are the entrepreneurial skills needed by senior secondary agricultural science students for self-reliance in marketing of cassava roots (tubers) in Enugu State.

Hypothesis

The following null hypothesis was tested at 0.05 level of significance

H_{o1}: There is no significant difference between the mean ratings of the responses of extension workers from Awgu, Enugu, and Nsukka agricultural zones of Enugu State regarding the entrepreneurial skills needed by senior secondary agricultural science students for self-reliance in harvesting cassava roots (tubers) in Enugu State.

H$_{o2}$:   There is no significant difference between the mean ratings of the responses of agricultural science teachers with degree and agricultural extension workers on the entrepreneurial skills needed by senior secondary agricultural science students for self-reliance in marketing of cassava roots (tubers) in Enugu State.

Research Method

The descriptive survey research was used to carry out this study. A survey research design is that in which generalizations are made over the entire population from an ample of a sample population (Uzoagulu, 2011). The design was used because the researcher made use of questionnaire to collect data from the agricultural extension workers and teachers with degree teaching agricultural science in senior secondary schools on entrepreneurial skills needed in harvesting and marketing of cassava roots (tubers) in Enugu State.

The study was conducted in Enugu State. Enugu State is made up of six agricultural zones namely Agbani, Awgu, Enugu, Enugu-Ezike, Obollo-Afor, and Udi. Enugu State is mostly grassland with scattered forests. The core of the state's economy is agriculture.

The population of the study comprised of 380 respondents made up of 286 teachers of agricultural science with degree in senior secondary schools in Enugu State (Source: Statistics Unit Post Primary Schools Management Board, Enugu, 2017) and 94 agricultural extension workers in the six agricultural zones in Enugu State (Source: Statistics Unit Enugu State Agricultural Development Programme Office, Enugu, 2017). The entire population was used for the study because the population size was manageable, therefore no sampling was made.

A self-structured questionnaire item was used as instruments for data collection. The questionnaire contained a total of 25 structured entrepreneurial skill items generated from an extensive review of literature and information from cassava farmers in cassava production enterprises. Each entrepreneurial skill item had a four-point response scale of Very Highly Needed (VHN)-4; Highly Needed (HN)-3; Moderately Needed (MN)-2; Not Needed (NN)-1

The instrument was subjected to face validation by three experts from the department of Technology and Vocational Education ESUT. They validated the instrument to ensure the appropriateness of the measuring instrument and that the instrument was structured to address the purpose of the study (Uzoagulu, 2011). The comments of the validators were used to modify the final instrument used for data collection.

The reliability of the instrument was determined by using Cronbach Alpha reliability method to determine the internal consistency of the instrument. The cluster yielded a coefficient reliability of 0.87.

A total of 380 copies of the questionnaire was distributed to the respondents with the help of three research assistants. These assistants were given orientation to assist the researcher in administering the instruments to the respondents. A total of three hundred and sixty-two copies (362) properly filled and returned was used for data analysis.

The data was analysed using weighted mean with standard deviation to answer the research questions. The analysis of variance and t-test were used to test the null hypothesis of no significant difference at probability level of 0.05. The analysis of variance was used to determine whether location of the agricultural extension workers affected their responses. The mean, standard deviation, and analysis of variance are presented on the same table for each research question. The decision was based using real limits of the mean thus:

Very Highly Needed (VHN) – 3.50-4.00

Highly Needed (HN) – 2.50-3.49

Moderately Needed (MN) – 1.50-2.49

Not Needed (NN) – 1.00-1.49

The null hypothesis was rejected if the F-calculated was less than the critical F-ratio, but accepted if the F-calculated exceeds the critical F-ratio.

Results

The results obtained from the data analysed are presented in tables below according to the research question and hypothesis that guided the study.

Research Question 1

What are the entrepreneurial skills needed by senior secondary agricultural science students for self-reliance in harvesting cassava roots (tubers) in Enugu State.

Null Hypothesis 1

There is no significant difference between the mean ratings of the responses of extension workers from Awgu, Enugu and Nsukka agricultural zones of Enugu State on the entrepreneurial skills needed by senior secondary agricultural science students for self-reliance in harvesting cassava roots (tubers) in Enugu State.

To answer this research question and null hypothesis, the results are presented in table one below:

Table 1: Mean ratings of agricultural science teachers with degree and agricultural extension workers and analysis of variance of agricultural extension workers from Awgu, Nsukka and Enugu Zones regarding the entrepreneurial skills needed by senior secondary agricultural science students for self-reliance in harvesting cassava roots (tubers) in Enugu State.

S/N	Entrepreneruial skills needed in harvesting cassava crop	Number of respondents N=362	$\bar{X}$	SD	Decision	Awgu Zone N = 13		Nsukka Zone N = 26		Enugu Zone N = 11		F-cal	F-Tab	Decision
						$\bar{X}_1$	SD1	$\bar{X}_2$	SD2	$\bar{X}_3$	SD3			
1	Harvest when the tubers have not become fibrous or woody	362	3.59	0.60	VHN	4.00	0.00	3.19	0.40	3.55	0.52	19.85	3.18	S
2	Harvest when cassava is matured at 12 - 15 months	362	3.44	0.61	HN	4.00	0.00	3.31	0.47	3.36	0.67	10.29	3.18	S
3	Harvest when roots are old enough to accumulate starch	362	3.31	0.69	HN	3.00	0.00	3.42	0.50	3.45	0.52	4.68	3.18	S
4	Harvest when 2 or 3 leaves turn yellow or fall off	362	3.12	0.72	HN	2.00	0.00	3.27	0.67	2.00	1.00	22.38	3.18	S
5	Harvest when the soil starts cracking but not before 9 months	362	3.07	0.66	HN	2.00	0.00	3.12	0.59	2.91	0.94	14.74	3.18	S
6	Harvest when the soil is moist for easy harvesting and to minimize damage	362	3.44	0.62	HN	4.00	0.00	3.38	0.49	3.09	0.70	11.51	3.18	S
7	Harvest in piece-meal as need arises	362	3.43	0.68	HN	3.00	0.00	3.46	0.51	3.18	0.60	4.61	3.18	S
8	Harvest cassava with cutlass, hoe or machines	362	3.51	0.66	VHN	3.00	0.00	3.42	0.58	3.00	1.00	2.86	3.18	NS

			X	SD										
9	Harvest by lifting the lower part of the stem and pulling the roots out of the ground by hand	362	3.57	0.62	VHN	4.00	0.00	3.46	0.51	3.64	0.50	6.56	3.18	S
10	Harvest using mechanical devices to loosen the roots	362	3.10	0.79	HN	3.00	0.00	3.38	0.57	3.27	0.65	2.45	3.18	NS
11	Remove the pulled roots from the base of the plant by hand or cutlass, then pick the roots by hand	362	3.52	0.61	VHN	4.00	0.00	3.12	0.33	3.73	0.47	37.15	3.18	S
12	Take the harvested tubers to packing shed	362	3.46	0.71	HN	3.00	0.00	3.62	0.50	3.55	0.52	9.10	3.18	S
13	Remove decayed tubers, smaller roots and sand attached to the tubers	362	3.38	0.73	HN	3.00	0.00	3.77	0.43	3.45	0.52	16.51	3.18	S
	Grand Cluster Values Grand Cluster Values	**362**	**3.38**	**0.66**	**HN**	**3.23**	**0.00**	**3.38**	**0.50**	**3.24**	**0.66**	12.51	3.18	S

Note: VHN = Very Highly Needed, HN = Highly Needed, X = Mean, SD = Standard Deviation, S = Significant, NS = Not Significant

Table 1 shows that mean ratings of 3.59, 3.51, 3.57 and 3.52 were recorded for items 1, 8, 9 and 11 respectively, thereby showing that the relevant entrepreneurial skills are needed by senior agricultural science students for harvesting of cassava. Similarly, mean ratings of 3.44, 3.31, 3.12, 3.07, 3.44, 3.43, 3.10, 3.48 and 3.38 were obtained for items 2, 3, 4, 5, 6, 7, 8, 10, 12 and 13 respectively. This shows that those skills were perceived by the respondents as highly needed (HN) by the agricultural science students.

A grand mean of 3.38, with standard deviation of 0.66, was obtained for the 13 items, which is indicative of fact that the entrepreneurial skills generally, highly needed by senior agricultural science students for self-reliance in harvesting of cassava in Enugu State. The low standard deviation obtained for all the items indicates that the agricultural science teachers and agricultural extension workers did not differ remarkably in their views regarding the relevance of the entrepreneurial skills to senior agricultural science students' self-reliance harvesting of cassava.

Table 1 also shows that the calculated F-value at .05 level of significance and 2 degree of freedom (between groups) and 47 degree of freedom (within group) for eleven (11) items ranged from 4.61 - 37.5 while the critical or table F-value is 3.18. Since the calculated F-value is greater than the critical value, the null hypothesis is then rejected. This invariably means that there is significant difference with regards to these eleven items in the mean ratings of agricultural extension workers from Awgu, Enugu and Nsukka agricultural zones of Enugu State on the entrepreneurial skills needed by senior secondary agricultural science students for self-reliance in harvesting of cassava crop in Enugu State. However, the items that showed no significant differences are items 8, 10. They have their f-calculated as 2.86 and 2.45 respectively. This implies that the null hypothesis of no significant difference is not rejected for these two items. The table also showed that the cluster value for the F-calculated was 12.51 which was greater than the critical value therefore the null hypothesis of no significant difference is rejected for null hypothesis 5.

Research Question 2

What are the entrepreneurial skills needed by senior secondary agricultural science students for self-reliance in marketing of cassava roots (tubers) in Enugu State. The data showing the answer to this research question is presented in table two below

Null Hypothesis 2

There is no significant difference between the mean ratings of the responses of agricultural science teachers with degree and extensions workers on the entrepreneurial skills needed by senior secondary

agricultural science students for self-reliance in marketing of cassava roots (tubers) in Enugu State.The table showing the analysis of this null hypothesis is also shown in table 2 below.

Table 2: Mean rating and item by item t-test of difference between the mean ratings of agricultural science teachers with degree and agricultural extension workers regarding the entrepreneurial skills needed by senior secondary agricultural science students for self-reliance in marketing of cassava roots (Tubers) in Enugu State.

S/N	Entrepreneurial skills needed in marketing of cassava products	Respondents N = 362				Teachers N = 268 X_1	SD_1	Extension Workers N = 94 X_2	SD_2	t-cal	t-critical	Decision
			X	SD	Decision							
1	Advertise both harvested and processed cassava roots	362	3.59	.589	VHN	3.65	0.58	3.43	0.58	3.26	1.96	S
2	Make a market survey to identify the cost of different quality and quantity of cassava products in the market	362	3.61	.547	VHN	3.64	0.52	3.54	0.62	1.46	1.96	NS
3	Make a market survey to identify measures used and prices attached to each measures	362	3.64	.621	VHN	3.69	0.62	3.52	0.60	2.25	1.96	S
4	Fix the prices according to each product	362	3.50	.691	VHN	3.56	0.65	3.32	0.77	2.93	1.96	S
5	Package and grade the cassava roots and products according to quality and quantity	362	3.59	.626	VHN	3.66	0.58	3.38	0.71	3.76	1.96	S
6	Determine when to sell or store cassava product for maximum profit	362	3.60	.534	VHN	3.62	0.54	3.53	0.52	1.36	1.96	NS
7	Find distribution channels	362	3.59	.622	VHN	3.66	0.53	3.38	0.81	3.73	1.96	S
8	Keep all financial records including income and expenses	362	3.65	.588	VHN	3.70	0.56	3.50	0.64	2.83	1.96	S
9	Bargain prices of cassava products with the buyers	362	3.66	.561	VHN	3.69	0.58	3.57	0.50	1.78	1.96	NS
10	Sell on the spot or transport to buyers	362	3.49	.646	HN	3.55	0.65	3.32	0.59	2.99	1.96	S
11	Receive payment at the selling spot	362	3.54	.686	VHN	3.55	0.71	3.51	0.62	0.50	1.96	NS

12	Keep balance sheet to determine profit margin or calculate income and expenditure	362	3.67	.591	VHN	3.71	0.57	3.56	0.65	2.00	1.96	S
	Grand Cluster Values	**362**	**3.59**	**0.60**	**VHN**	**3.64**	0.59	**3.46**	0.63	2.40	1.96	S

Note: VHN= Very Highly Needed; HN= Highly Needed; X= Mean; SD= Standard Deviation; S= Significant; NS= Not Significant

Table 2 shows that mean ratings of 3.50 and above were recorded for items 1, 2, 3, 4, 5, 6, 7, 8, 9, 11 and 12, indicating that the relevant entrepreneurial skills were perceived by the respondents to be very highly needed (VHN) by senior agricultural science students. In a related development, a mean of 3.49 was obtained for item 10, showing that the entrepreneurial skill (sell on the spot or transport to buyers) was deemed to be highly needed (HN) by senior agricultural science students. A grand mean of 3.59, with standard deviation of 0.60, was obtained for all the 12 items, thereby showing that, generally, the identified entrepreneurial skills are needed by agricultural students for marketing cassava products. The low standard deviation (0.60) is indicative of the fact that the respondents did not differ markedly in their opinions regarding the extent to which the entrepreneurial skills are needed by senior secondary agricultural science students in marketing of cassava products.

Furthermore, table 2 shows that the calculated t-value, at 0.05 level of significance and 360 degree of freedom, for eight (8) items ranged from 2.00 - 3.76 while the critical t-value is 1.96. Since the calculated t-value is greater than the critical value, the null hypothesis for these eight (8) items is, therefore, rejected. This means that a significant difference exists in the mean ratings of eight (8) items responded to by agricultural science teachers with degree and agricultural extension workers regarding the entrepreneurial skills needed by senior secondary agricultural science students for self-reliance in marketing of cassava products in Enugu State. The items that showed no significance difference are items 2, 6, 9 and 11. They have their t-calculated as 1.46, 1.36, 1.78 and 0.50 respectively. This implies that the null hypothesis of no significance difference is not rejected for these four items.

Discussion of Findings

The result of the study revealed that all the thirteen entrepreneurial skills for harvesting cassava were all highly needed by senior secondary agricultural science students for self-reliance in harvesting cassava roots (tubers) they had a grand mean of 3.38 with standard deviation of 0.66. The result of the study agreed with the recommendation of International Institute of Tropical Agriculture IITA (1990) that it is best to harvest cassava at a time when the roots are old enough to have accumulated sufficient amount of starch but not old as to have excessively woody or fibrous roots. Erebor (1998) added that cassava can be harvested when 2 or 3 leaves turn yellow or fall and when the soil around starts cracking. This implies that there is need for-timely harvesting of cassava to reduce the probability of insect pests attack and prevent fungal attack on crops. Aniekwe, Onyia, Ngwu, & Mba (2005) added that cassava should be harvested when the starch content is at its peak. This is manifested by shading of old leaves without the new flush forming. They recommended harvesting cassava at 7 -15 months after planting depending on the cultivar. The result of the study was also in line with Okafor (2007) that cassava can be harvested by hand by lifting the lower part of the stem and pulling the roots out of

the ground, then removing them from the base of the plant manually. He further suggested the use of mechanical harvester that helps to minimize damage to the shelf life. Iwena (2008) added the use of cutlass to remove some soil and the stem being pulled gently so that the tubers are pulled along. Teachers of agricultural science should take the students to farm to demonstrate this skill because learners do not forget easily actions which they see being demonstrated. Aniekwe et al (2005) was in support of this by stressing that cassava should be harvested before the dry session starts to reduce loss of tubers during the dry season when the soil is hard and dry as well as in piece-meal over a period of time after maturity. This means that harvesting of cassava is done as the need arises since the keeping quality of cassava after harvesting is poor. Okafor (2007) agreed with this by opining that in practice cassava plots are hardly ever harvested at once or all at the recommended time of harvesting. This is because cassava roots once harvested deteriorates rapidly and cannot be kept in good condition for more than one or two days after harvesting. Therefore farmers only harvest what they need for the moment leaving the remaining roots not harvested until they are needed.

Basically in Enugu State, cassava can be harvested at any time of the year. Some farmers harvest as early as six months after planting while others may leave the crop for 18 - 24 months. This harvesting is done in piece meal as need arises. Therefore teachers of agricultural science in secondary school should put this in consideration while imparting harvesting skills to the students.

The null hypothesis tested (Table 1) showed that eleven items revealed that there is a significant difference in the mean ratings of agricultural extension workers from Awgu, Enugu and Nsukka agricultural zones of Enugu State on the entrepreneurial skills needed by senior secondary agricultural science students for self-reliance in harvesting of cassava crop in Enugu State. The significant difference is in line with International Institute for Tropical Africa (1990) report that the exact time for harvesting cassava depends on several factors; the cultivars, the rain fall, soil conditions, planting method and the temperature. Aniekwe, et al (2005) agreed with IITA (1990) report by stating that harvesting of cassava can be from 7 - 15 months after planting depending on the cultivar. The findings also revealed that there was no significant difference in the mean ratings of the respondents in two items (8 and 10). The items were harvest cassava when roots are old enough to accumulate starch and harvest cassava with cutlass, hoe, and machines. The reason may be due to the fact that there is a time when cassava will be harvested and it will not accumulate enough starch which is the main product of cassava. This is in line with Okafor (2007) that stressed that the ideal time to harvest cassava is when the plant is between twelve to fifteen months. This is to enable higher yield of fresh roots and extractable starch but not old enough to loose quality mainly due to increased lignification. This harvesting is mainly done manually using cutlass and hoe or mechanically using cassava pullers or harvesters (Iwena 2008).

The findings on research question two (table 2) of the study showed that all the itemized entrepreneurial skills were very highly needed by senior secondary agricultural science students in marketing of cassava processed products for self-reliance in Enugu State. This findings are in line with Murray, (2002) who noted that marketing of cassava processed roots required skills such as advertising, market survey, record keeping of purchases and sales, choice of type of transportation to be used depending on the quantity of processed products, containers, measures to be used to sell in order to increase patronage. Okafor (2007) added some basic skills such as ability to calculate time of production, time of consumption, search for market, sorting, grading, weighing, fixing prices of products and keeping financial records. It was also revealed that the farmer should receive payment at the selling sport. Miller (2006) agreed with this by advising that before a produce sells, the producer should start by examining the local market, so that he/she can get not only a feel for the prices of cassava products but also the type of products which the buyers pay the best price.

The null hypothesis tested showed eight items revealed significant difference existed in the mean rating of agricultural science teachers with degree and agricultural extension workers regarding the entrepreneurial skills needed by senior secondary agricultural science students for self-reliance in marketing of cassava processed products in Enugu State. This shows that their profession have influenced the respondents as regards to these items.

Conclusion/Recommendation

Entrepreneurial skills is a practical thing; it is learned. Learners must be exposed to new ideas over a period of time and in a variety of ways before they begin to respond to them. Incorporating the identified entrepreneurial skills into the curriculum for senor secondary schools agricultural science program could provide the step by step entrepreneurial skill-oriented activities required to stimulate and direct students interest towards self-reliance in cassava production which will help alleviate poverty and improve sustainability in food production.

This study has therefore identified various entrepreneurial skills in which cassava roots could be processed and marketed which could make senior secondary students to be self-reliant. It was therefore recommended that:

1. Teachers of agricultural science should use appropriate instructional method such as the use of practical/laboratory, field and demonstrations in delivering agricultural science lessons
2. The government should provide schools with adequate facilities and equipment for practical activities in agriculture
3. Regularly field trips and excursions should be organised for agricultural science to already established entrepreneurs and agricultural departments to widen their horizons by having the opportunity to see all these skills been practiced.

4.

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