SKILLS REQUIRED BY SENIOR SECONDARY AGRICULTURAL SCIENCE STUDENTS FOR CUCUMBER *(Cucumis sativus)* PRODUCTION FOR SELF-RELIANCE IN ENUGU STATE

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Abstract: *The main purpose of the study was to determine the skills required by senior secondary agricultural science students for commercial cucumber production for self-reliance in Enugu State. The study was guided by three research questions and three null hypotheses. A descriptive survey research design was adopted for the study. The population for the study was 314 respondents made up of 286 teachers of agricultural science and 28 agricultural extension workers in the six agricultural zones of Enugu State. The instrument used for data collection was a 26item questionnaire grouped into three sections according to the research questions that guided the study. The instrument was validated and reliability of the instrument was determined using Cronbach Alpha which yielded 0.79. Out of 314 copies of the questionnaire distributed, 308 copies were properly filled, returned and used for data analysis representing 98% return rate. Mean, standard deviation and t-test statistics were the statistical tools used. From the result of data analysed, the study identified pre-planting operation skills, planting and field management operation skills required by senior secondary school agricultural science students for cucumber production in Enugu State. The findings of the study showed that there is no significant difference in the mean ratings of extension workers and senior secondary agricultural science teachers on the identified cucumber operation skills for commercial production. Based on the findings, recommendations were made which include: that the curriculum designers should adopt training students in cucumber production for self-reliance after graduation from secondary schools and teachers of agricultural science in secondary schools should ensure that the identified skills are used in teaching the students in crop production and related topics for interest and skill development.*

Keywords: Skills, Cucumber Production and Self-reliance

INTRODUCTION

Cucumber *(cucumis sativus)* is a creeping vine that bears cucumiform fruits that are used as vegetables. It belongs to the group (cucurbitaceae) which includes squashes, melons, water melon and pumpkins (Hochmuth, 2019). Cucumber is a navue of Asia and Africa where it has been consumed for over 3,000 years. (Valenzuela, Hamasaki and Fukuda, 2013).

Cucumber production is very popular in many areas in Africa and other parts of the world. It was only cultivated n Northern Nigeria in the past, but now cultivated in other parts of Nigeria, Enugu inclusive.

Cucumber is a very tender, warm season plants that grow best in minimum temperature of 15.5^{o}C and maximum temperature of 32.20^{o}C (Scrader, Agaiar and Mayberry, 2012). The authors further opined that low temperature below 15.6^{o}C reduces germination rate of cucumber seeds. Supporting this, Sterm (2018) added that cucumber are warm season vegetables that requires warm temperature of 35°C for germination and will not germinate below 15°C and this should be maintained for 72 hours or until the radical emerges from the seed coat.

Cucumber performs well on a wide range of soils that are fertile with high moisture holding capacities. This was why Ogbodo, Okorie and Utobo (2013) opined that cucumber requires soil types which possess a high water holding capacity and good drainage. The authors went further to opinion that the soil for cucumber production should be rich in organic matter with a soil pH range of 5.5 to 7.0. This implies that cucumber can do well in the study area (Enugu State) especially in Ogbeke and Ugwogo Nike areas of Enugu State where cucumber is presently grown by farmers at a subsistence level.

The nutritional importance of cucumber is overwhelming. Sterm (2018) pointed out that cucumber has the advantage of being relatively low in calories and high in nutrients and an excellent source of fibre needed for a healthy digestive system. Furthermore, Hochmuth (2019), highlighted that cucumber contain high level of nutrients known as cucurbitacins, which may help prevent cancer by stopping cancer cells from proliferating and surviving. In supporting this, Valenzuela, et al (2013) reported that cucumber is a popular fresh market vegetable in salads and is also processed into other useful food products. The authors further stated that cucumber provides vitamin C, vitamin B, beta- carotene, calcium, phosphorus, iron, sodium, potassium and zinc.

The health benefits of cucumber as highlighted by Ogbodo et al, 2017) include re-hydrating the body, regulation of blood pressure, body weight reduction, cholesterol reduction, diabetes cure and antioxidant activity. In the view of Hochmuth (2009), cucumber have been linked to lowering the risk of obesity, diabetes, heart disease among others, while promoting a healthy complexion, increasing energy, and healthy body weight. In Nigeria, the commercial production and marketing of cucumber is gradually gaining importance. In the study area, cucumber is an important fruit of high nutritional and commercial value. An attempt to improve its production through the application of required skills by senior secondary agricultural science students will be a right step towards empowering the youths with saleable skills for sustainable livelihood.

Skills according to Mbah and Umurhurhu (2016) are the ability to make purposeful movements that are necessary to complete or master a particular task. This implies that skill is the ability to do something well. It is acquired through training to do a particular task. According to Alade (2016), skill is referred to as the ability to use one's knowledge effectively and readily in the execution of a task or performance-oriented activities. That is a person's ability in performing a given task as well as a result of training and practice. Skill with reference to this study can be regarded as performance activities needed by senior secondary agricultural science students in cucumber production on commercial basis. Acquisition of these skills in cucumber production will make them to be self-reliance on graduation.

Self-reliance according to Leghara and Mb a (2015), 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. For the secondary agricultural science students to be self- reliant in cucumber production they are required to acquire the skills in pre-planting, planting and field management operations.

Pre-planting operations according to Ndu (2012) are all the activities carried out before the actual planting of seeds. They include site selection, clearing of the land, stumping of the roots, tilling the soil with appropriate tools among others. This is followed by planting operations. The farmer need to carry out the actual planting which involves the actual process of placing planting materials into the soil. Such operations include opening the soil with appropriate tool for direct seed sowing, seed rate, spacing among others.

To ensure good development and adequate growth of the plant in the field, the farmer need to carry out field management operations. Such operations include: weeding the farm, mulching tender cucumber plant to moderate temperature, trimming the vine to prevent fruit from developing on a wet soil among others. All these activities when properly carried out ensures good production of cucumber in general and particularly in Enugu State.

In Enugu State, which is the study area, production and marketing of cucumber has contributed to the economy of the state and the nation as a whole. As a result, it has made the production and marketing of cucumber products suitable for self-reliance by senior secondary school students after graduation. In the context of this study, senior secondary agricultural science students are those who have passed the upper basic level and are interested in offering agricultural science at the senior secondary school, and have enrolled in agricultural science. These group of students have passed the Basic Certificate Examination (BCE) at senior Basic and are offering agricultural science as a vocational subject in the senior secondary level. This implies that these students can produce and market cucumber for self-reliance.

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 attitude 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 implementing these skills to the students in agricultural science (Osinem, 2016). It is expected that these teachers will equip the students with adequate skills in agricultural science especially in cucumber production. For these teachers to improve in their knowledge in agricultural science especially in commercial cucumber production, 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 and Ejiofor, 2012). In the area of study which is Enugu state, these agricultural extension workers would be of great help in identifying the skills required in commercial cucumber production by senior secondary agricultural science students for self-reliance. This is because it is expected that these agricultural science students are required to acquire enough skills in cucumber production as contained in their syllabus to take up this enterprise in cucumber production after graduation from school.

In the study area it has been observed that the teaching method mostly used in senior secondary school agriculture is the lecture method which deprives the students the practical knowledge that is needed in skill acquisition as recommended by the National policy on Education (FRN, 2013).

This has made most of these students roaming about the streets aimlessly idling away their time, planning and carrying out one crime or the other such as stealing, robbery, drug addiction among others. Some of them migrate to the urban areas in search of white collar jobs that are not readily available. It is expected that if skill training programme in cucumber production is organized for these students in senior secondary schools it will help them to fit into production work. This is because in the training programme, the students will be exposed to some skills required for pre-planting, planting and field management of cucumber.

If these skills required in cucumber production were identified and used in training the senior secondary agricultural science students while in school, there is the tendency that they could take jobs in cucumber production after graduation from school for self reliance. This will help to improve their living, limit rural urban migration, increase cucumber availability in the market and improve the overall economy of Nigeria.

The main purpose of the study was to identity the skills required by senior secondary agricultural science students for commercial cucumber production for self-reliance in Enugu State. Specifically, the study sought to determine.

1. The pre-planting operation skills required by senior secondary agricultural science students in cucumber production for self-reliance in Enugu State.
2. The planting operation skills required by senior secondary agricultural science students in cucumber production for self-reliance in Enugu State.
3. The field management operations skills required by senior secondary agricultural science students in cucumber production for self-reliance in Enugu State.

Research Questions

The following research questions guided the study.

1. What are the pre-planting operation skills required by senior secondary agricultural science students in cucumber production for self-reliance in Enugu State?
2. What are the planting operation skills required by senior secondary agricultural science students in cucumber production for self-reliance in Enugu State?
3. What are the field management operations skills required by senior secondary agricultural science students in cucumber production for self-reliance in Enugu State?

Hypotheses

The following null hypotheses were tested at 0.05 of significance.

Ho_1: There is no significant difference between the mean response of agricultural extension workers and agricultural science teachers on the pre-planting operation skills required by senior secondary agricultural science students in cucumber production for self-reliance in Enugu State.

Ho_2: There is no significant difference between the mean response of agricultural extension workers and agricultural science teachers on the planting operation skills required by senior secondary agricultural science students in cucumber production for self-reliance in Enugu State?

Ho_3: There is no significant difference between the mean response of agricultural extension workers and agricultural science teachers on the field management operations skills required by senior secondary agricultural science students in cucumber production for self-reliance in Enugu State.

Research method

This study adopted a descriptive survey research design. A survey research design is that in which generalization are made over the entire population from an ample of a sample population (Uzoagulu, 2013). The design was used because the researcher made use of questionnaire to collect data from the respondents.

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 naturally endowed with good agricultural environment favourable for cucumber production.

The population of the study comprised of 314 respondents made up of 286 teachers of agricultural science senior secondary schools of Enugu State (source: statistics unit post primary schools management Board, Enugu, 2021) and 28 agricultural extension workers in the six agricultural zones of Enugu State (source: Statistics Unit, Enugu State Agricultural Development Programme office, Enugu, 2021). The entire population was used for the study because the population size was manageable, therefore no sampling was made

A self-structured questionnaire was used as instruments for data collection. The questionnaire contains a total of 26th structured skill items generated from an extensive review of literature and information from extension workers and farmers in cucumber production enterprises. Each skill item has a four-point responses option of Very Highly Required (VHR), Highly Required (HR), Moderately Required (MR), and Not Required (NR) with a corresponding values of 4, 3, *2* and 1 respectively. The instrument was validated by three experts, two from Department of Technology and Vocational Education, and one from Department of Computer and Mathematics Education, all form Enugu State University of Science and Technology (ESUT).

The reliability of the instrument was determined by using Cronbach Alpha reliability method to determine the internal consistency of the instrument and a coefficient of 0.78 was obtained. A total of 314 copies of the questionnaire were distributed to the respondents with the help of three research assistants who were briefed by the researcher on how to administer and retrieve the instrument. Out of 314 copies of the questionnaire distributed 308 copies were properly filled returned and used for data analysis. Data collected were analyzed using mean and standard deviation to answer the research questions, while t-test was used to test the null hypotheses at .05 level of significant using SPSS Decisions were made using the real limits of number on four point rating scale such as follows: Very Highly Required (VHR) - 3.50-4.00, Highly Required (HR) - 2.50-3.49, Moderately Required (MR) – 1.50-2.49, Not Required (NR) – 1.00-1.49

The standard deviation was used to determine the homogeneity or otherwise of the opinions of the respondents. The t-test result was compared with the significant value (using SPSS) at .05 level of significance and at appropriate degree of freedom. The null hypotheses was significant where the probability value was less than the .05 significant level at appropriate degree of freedom, otherwise the null hypotheses was not significant.

Results

The results obtained from the data analyzed are presented in tables below according to the research questions and hypotheses that guided the study.

Research Question 1

What are the pre-planting skills required by senior secondary agricultural science students in cucumber production for self-reliance in Enugu State.

Table 1:

Mean responses with standard deviation of the respondents on the Pre-Planting Operation Skills

S/N	Skills required for pre-planting operations include:	Extension workers N = 27 X_1	SD_1	Agric. Science teachers N = 281 X_2	SD_2	Overall X_G	SD_1	Decision
1	Clear the weed very low for easy tilling	3.44	0.56	2.85	0.83	3.15	0.84	High required
2	Pack dry weed from farm land or burn where necessary	3.35	0.73	3.09	0.81	3.22	0.81	High required
3	Stump stem and roots on the farm before tillage operation	3.27	0.86	3.23	0.68	3.25	0.68	High required
4	Till the soil with appropriate tools for optimum root penetration	3.25	0.96	3.19	0.66	3.22	0.67	High required
5	Fumigate the soil with appropriate fungicides before planting cucumber seeds	3.28	0.94	3.08	0.60	3.18	0.61	High required
6	Select appropriate cultivars based on other desirable qualities.	3.39	0.62	3.05	0.78	3.22	0.78	High required
7	Identify disease resistant varieties of cucumber.	3.46	0.82	2.95	0.78	3.21	0.78	High required
8	Carryout seed germination test on the selected seeds before treatment.	3.10	0.52	3.18	0.66	3.14	0.66	High required
9	Treat cucumber seeds with recommended fungicides before planting	3.05	0.82	2.95	0.78	3.00	0.78	High required
10	Establish nutrient status of the soil before planting.	3.24	0.77	3.40	0.81	3.32	0.79	High required
	Cluster Mean/Standard Deviation	**3.28**	**0.76**	**3.10**	**0.74**	**3.19**	**0.74**	**High required**

Note: $\overline{x}$ = mean, SD = Standard Division; HR = Highly Required

Table 1 indicates that the items overall mean rating ranges from 3.00 and 3.25 depicting highly required. This shows that the items are the pre-planting operation skills required by senior secondary agricultural science students in Enugu State in cucumber production for self-reliance. The overall cluster mean rating of

3.19 indicates highly required. This implies that pre-planting operation skills are highly required by senior secondary agricultural science students for cucumber production. The low standard deviation of 0.74 shows that the respondent's opinions do not differ remarkably on their responses to the items.

Hypothesis 1

There is no significant difference between the mean response of extension workers and agricultural science teachers on pre-planting operation skills required by senior secondary agricultural science students in cucumber production for self-reliance.

Table 1:

Summary of t-test Analysis on the Mean Responses of the Respondents on Pre-Planting Operation Skills

Variables	N	T	df	Sig. (2 tailed)	Mean difference	Std. Error difference	Decision
Extension workers agricultural science teachers	27 281	1.238	306	0.136	7.08610	4.92525	NS

The result of t-test analysis in Table 2 shows that the t-value at 0.05 level of significant and 306 degree of freedom for the items is 1.23 with a significant value of 0.13. As the significant value of 0.13 is more than the 0.05 level of significant, the null hypothesis is not significant. This means that there is no significant difference with respect to the items on the mean responses of extension workers and agricultural science teachers on pre-planting operation skills required by senior secondary agricultural science students in Enugu State in cucumber production for self-reliance.

Research Question 2

What are the planting operation skills required by senior secondary agricultural science students in cucumber production for self-reliance in Enugu State.

Table 2:

Mean Responses and Standard Deviation of the Respondents on the Planting Operation Skills

S/N	Skills required for Planting operation includes:	Extension workers N = 27		Agric. Science teachers N = 281		Overall		Decision
		X_1	SD_1	X_2	SD_2	X_G	SD_1	
11	Maintain approximately 1.5 pound of seeds per hectare	3.36	0.73	3.09	0.68	3.22	0.69	High required
12	Conduct thinning for direct seeded cucumber	3.17	0.58	2.91	0.78	3.04	0.79	High required
13	Open the soil with appropriate tool for direct seed sowing	3.42	0.71	3.07	0.73	3.25	0.72	High required
14	Sow 2-3 seeds per hole to increase germination rate	3.14	0.82	3.02	0.82	3.08	0.81	High required
15	Maintain in-row spacing of 21-31cm and within row spacing of 91.183cm	3.25	0.96	3.19	0.79	3.22	0.79	High required
16	Sow seed of 2-5cm sowing depth	3.16	0.82	2.96	0.78	3.06	0.78	High required
17	Replace un-germinated cucumber seeds after 8 days of initial planting	3.22	0.49	3.07	0.66	3.15	0.65	High required
	Cluster Mean/Standard Deviation	**3.25**	**0.73**	**3.04**	**0.75**	**3.15**	**0.75**	**High required**

Note: $\overline{x}$ = mean, SD = Standard Division; HR = Highly Required

The data presented in Table 3 above shows that the mean ratings of the respondents on the items ranges from 3.04 and 3.25 indicating highly required. This shows that respondents identified the items as planting operation skills required by senior secondary agricultural science students in cucumber production for self-reliance in Enugu State. The overall cluster mean of 3.15 further revealed that the teachers and extension workers identified the itemized as the planting operation skills highly required by senior secondary agricultural science students for cucumber production of self-reliance in Enugu State. The low standard deviation of 0.75 shows that the respondents have consensus opinions to the itemized skills for planting operations of cucumber production.

Hypothesis 2

There is no significant difference between the mean responses of the respondents on planting operation skills

Table 4:
Summary of t-test Analysis on the Mean Responses of the Respondents on Planting Operation Skills

Variables	N	T	df	Sig. (2 tailed)	Mean difference	Std. Error difference	Decision
Extension Workers Agricultural Science Teachers	27 281	0.813	306	0.173	3.10641	2.78081	NS

The data obtained from the t-test analysis in Table 4 shows that the t-value at 0.05 level of significant and 306 degree of freedom for the items is 0.81 with a significant value of 0.17. Since the significant value of 0.17 is more than the 0.05 level of significant the null hypothesis is not significant. This means that there is no significant difference with respect to the items on the mean responses of extension workers and agricultural science teachers on planting operation skills required by senior secondary agricultural science students in cucumber production for self-reliance in Enugu State.

Research Question 3

What are the field management skills required by senior secondary agricultural science students in cucumber production for self-reliance in Enugu State?

Table 5:

Mean responses with standard deviation of the respondents on the Field Management Operation Skills

S/N	Skills required for field management	Extension Workers N=27		Agric Science Teachers		Overall		Decision
		X_1	SD_1	X_2	SD_2	X_G	SD_G	
18	Weed twice in the first 6-8 weeks after planting for good yield.	3 15	0.73	3.22	0.75	3.19	0.75	Highly Required
19	Maintain recommended soil moisture level through irrigation or drainage.	3.25	0.60	3.14	0.64	3.20	0.64	Highly Required
20	Much tender cucumber plant to moderate temperature and moisture in the soil.	3.06	0.82	2.98	0.72	3.02	0.72	Highly Required
21	Train the vines to prevent fruiting from developing on a wet soil.	3.45	0.78	2.88	0.81	3.17	0.81	Highly Required Highly Required
22	Remove old and diseased cucumber plants from the field.	2.75	0.51	2.82	0.67	2.79	0.66	Highly Required
23	Safe application of herbicides for effective weed control.	3.19	0.58	3.04	0.66	3.12	0.65	Highly Required
24	Apply fungicides to control fungi diseases	3.45	0.50	3.38	0.87	3.43	0.87	Highly Required
25	Spray cucumber plants with insecticide to reduce insect vector during pre-flowering	3.42	0.68	3.04	0.85	3.25	0.84	Highly Required
26	Apply 90-168kg N: 56-224kg P and 0-224kg/ha of K based on need.	2.98	0.82	3.43	0.68	3.21	0.95	Highly Required
	Cluster Mean/Standard Deviation	**3.14**	**0.71**	**3.16**	**0.72**	**3.18**	**0.78**	**Highly Required**

Note: $\bar{x}$ = mean, SD = Standard Division; HR = Highly Required

The analysis of data presented in Table 5 above shows that the mean rating of the items ranges from 2.79 to 3.43 indicating that the respondents identified the items as field management skills required by senior secondary agricultural science students in cucumber production for self-reliance in Enugu State. The overall cluster mean of 3.18 also depicts highly required. The standard deviation of 0.78 shows that the respondents have homogeneity in their responses to the items field management skills required by senior secondary agricultural science students in cucumber production for self reliance.

Hypothesis 3

There is no significant difference between the responses of extension workers and agricultural science teachers on field management skills required by senior secondary agricultural science students in cucumber production for self-reliance.

Table 6:
Summary of t-test Analysis on the Mean, Responses of the Respondents on Field Management Skill

Variables	N	t	df	Sig. (2 tailed)	Mean difference	Std. Error difference	Decision
Extension workers agricultural science teachers	27 281	0.815	306	0.673	2.90049	2.54298	NS

The result of data analysis obtained from the t-test in Table 6 shows that the t-value at 0.05 level of significant and 306 degree of freedom for the items is 0.815 with a significant value of 0.67. Since the significant value of 0.67 is more than the 0.05 level of significant the null hypothesis is not significant.

This means that there is no significant difference with respect to the items on the mean responses of extension workers and agricultural science teachers on field management skills required by senior secondary agricultural science students in cucumber production for self-reliance.

Discussion of Findings

The finding of this study on pre-planting operation for cucumber revealed that the senior secondary agricultural science students highly required skills in clearing the weed very low for easy tilling, packing dry weed from farm land or burn where necessary and stumping stem and roots on the farm before tillage operations among others. This finding are in line with the submission of Uzo (2012) who stated that the skills in pre-planting operations include: clearing the land, pack the weeds, breaking up the soil clods to prepare seedbed, make ridges and create farrows. Also, the findings of the study showed that there was no significant difference between the mean responses of agricultural science teachers and extension workers on the identified pre-planting operation of cucumber. The implication of no significant difference was that agricultural science teachers and extension workers shared the same opinion on the itemized skills as pre-planting operation for cucumber production. This finding was in line with Alawa and Okeke (2015) that status had no influence on the pre-planting operation in agricultural activities for effective farming practices and sustainable food production.

The findings of this study showed that the senior secondary agricultural science students required all the 7 skills in planting operations for cucumber production. The identified skills include: maintaining approximately 1.5 pounds of seed per hectare, sowing 2 to 3 seeds per hole to increase germination rate, sowing seeds at 2-5cm sowing dept, among others. These findings are in consonance with Nebechukwu (2014) who reported that planting operation of any crop involves the sowing or planting of crops and the progression from young plants, test for the viability of the seeds before sowing, plant or sow seeds at recommended depth and so on. The result of data analysis further depicted that there was no significant difference in the mean rating of agricultural science teachers and extension workers on the identified skills in planting operations for cucumber production. This showed that the status of the respondents had no significant influence to the identified planting operations required by agricultural science students for cucumber production in Enugu State.

The result revealed that the required skills on field management operation include: weed twice in the first 6-8 weeks after planting, maintain recommended soil moisture level through irrigation or drainage, apply insecticides to reduce insect vector among others. This finding is corroborated by that of the study conducted

by National Root crop Research Institute (2008) where the skills in field management operations were found to include the following: use of fertilizer based on recommendations, apply fungicides to control fungi diseases, among others.

The findings from the hypotheses tested indicated that, there is no significant difference in the mean responses of the two groups of respondents on the identified skills required by the senior secondary agricultural science students in field management for cucumber production in Enugu State. The implication of the findings of the study was that the professional experiences of the two groups of respondents had no significant influence on the itemized skills required by senior secondary agricultural science students in field management for commercial cucumber production.

Conclusion

Most senior secondary agricultural science students after graduation in Enugu State do not take to farming but instead they migrate to towns and cities in search for white collar jobs that are very rare to obtain. Consequently, they join the bad wagon of unemployed graduates who depend on relatives and government handout for survival. The reason for this trend is that, the level of skills acquired by these students while in school was very low. The perceived negative attitudes of the students towards developing interest in crop production and cucumber production in particular necessitated this study. The study therefore, identified twenty six skills required by the students for carrying out pre-planting, planting and field management operations of cucumber production at commercial scale for sustainable livelihood in the study area. Such skills need to be incorporated into the curriculum of secondary schools as well as programme of skill acquisition centres in Enugu State.

Recommendations

Based on the findings, discussions and conclusion of the study, the following recommendations were made:

1   The curriculum designers should consider the identified skill areas in developing the curriculum for training students in cucumber production self-reliance of the students.

2   The teachers of agricultural science in secondary schools should ensure that the identified skills are used in teaching the students in crop production and related topics for interest and skill development.

3   The government should ensure that the identified skills required for cucumber production are incorporated in the quality training and retraining of the teachers for better teaching of the students in agricultural science.

REFERENCES

Alade, LA *(2016), Evaluation of Technical Education Curriculum in Colleges of Education in south Western* Nigeria. Unpublished Ph.D. Thesis. Development of Teacher Education University of Ibadan.

Alawa, D. A. & Okeke (2015). Work skills required by secondary school graduates for entry[1] in to cocoyam production enterprise in Cross Rivers State, Nigeria. *Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS) 6(6) 418-424*

Federal Republic of Nigeria (2013). *National policy on Education.* Lagos, NERDC press.

llochmuth, R.C. (2019). *Green house cucumber production Florida Green house vegetable production Handbook,* vol. 3 Florida: Horticultural sciences Department, Florida cooperative Extension services.

Laghara, B.N. & Mba, C. N. (2015). Competencies/skills needed by STM Teachers Towards the Development of Relevant skills in student. *Journal of science Teachers Association of Nigeria.* 50ᵗʰ Annual Conference. HEBN Publishers PLC.

Mbah, C.O. & Umurhurhu, E. B. (2016), Improving the teaching learning of computer aided drafting and designing (CADD) for effective skill development in Nigerian tertiary institution. *International Technology Research Journal (1NTERJ) 4(1),* 24-29.

Ndu, A.U. (2012). *Guidelines on Agricultural science practical for schools and colleges.* Divine Educational publications.

Nebechukwu, A.N, (2014) *Work skills Needed by secondary school graduates for Entering into Cocoyam production Enterprises* in Enugu state, Nigeria. Department of vocational Teacher Education, University of Nigeria Nsukka.

Ogbodo, E.N., Okorie, P.O. & Utobo, E. B. (2013) Introducing cucumber for cultivation at New Different zone in Ebonyi state, South Eastern Nigeria . *Libyan Agriculture Research center journal international* 1(6):336-343.

Osinem, E.C(2016) *Managing Agricultural Education and Training: Resources, principal and Methods.* Enugu; Belong International publishers

Post Primary schools Management Board (2019) Statistics on the Number of Agricultural science Teachers in Enugu state.

Schrader, W.L., Aguiar, J.L. & Mayberry, K.S. (2021). Cucumber production in California University. Retrieved October 16, 2011 from *http://www.anrculalog.ucdavis.edu.*

Stem, K.R. (2018). *Fruit and vegetables,* Microsoft Encarta®2009. Microsoft corporation.

Ugwuoke, C.U. & Ejiofor, T.E. (2012). Skills Required by secondary school Graduates for success in pineapple production Enterprise in Nsukka, Agricultural zone in Enugu State. Journal of the Nigerian Vocational Association; 15(1): 172 – 183.

Uzo, J. U. (2012). *Tropical vegetable production.* In Mbah B.N. & Nnanyelugo D.O (Eds) food crops production, utilization and Nutrition. Proceedings of a course Held at the university of Nigeria, Nsukka, 10-23 April, pp 45-49

Uzoagulu, A.E. (2013), *Practical Guide to writing Research project Report in Tertiary Institutions.* Enugu: John Jacobs Classic

Valenzuela, H., Hamasaki, R.T. & Fukuda, S, (2013). *Crop production Guidelines'.* Field cucumber production Guidelines for Hawaii. Hawaii: University of Hawaii Cooperative Extension Service.