

## Skills Needed by Agricultural Education Students for Sustainable Vegetable Production in Enugu State

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**ABSTRACT:** *The main purpose of the study was to determine the skills needed by agricultural education students for sustainable vegetable production in Enugu State. The study was guided by five research questions and five null hypotheses. A descriptive survey research design was adopted for the study. The population for the study was 96 comprising of 33 extension agents and 63 registered vegetable farmers in Enugu State. The instrument used for data collection was a 42 item structural questionnaire grouped into five sections. The instrument was validated by three experts and reliability of the instrument was determined using Cronbach Alpha Statistics which yielded 0.79. Out of 96 copies of the questionnaire distributed 89 were properly filled and returned representing 92.71% return rate. Mean, standard deviation and t-test statistics were the statistical tools used. From the result of data analysed, the study identified the pre-planting skills, planting, post planting skills, harvesting skills and marketing skills required by agricultural education students for sustainable vegetable production in Enugu State. The findings of the study showed that there is no significant difference between mean responses of extension agents and vegetable farmers on the identified skills. Based on the findings, recommendations were made which include that the lecturers of agricultural education programme should ensure that the identified are skills used in teaching the students in crop production course of study and the government should ensure that the skills required for vegetable production are incorporated in the quality training and retraining of the students.*

**KEY WORDS:** skills, vegetable, agricultural education and sustainable vegetable production

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### INTRODUCTION

There has been an increasing concern in all quarters for improved skills in food production and security following the increasing population and demand for affordable food. Agricultural production in contemporary society requires adoption of improved seed, farming techniques and

the utilization of farm mechanization in managing the farming activities. Offordile (2012) opined that there is need to increase effort of farmers in all aspects of agricultural activities, including vegetable production as a component of crop production.

Vegetable production is part of crop production that deals with growing of vegetables as horticultural food crops. Vegetables are food crops which have their edible portions or parts characterized by high moisture content, high level of vitamins and minerals. According to Asogwa and Ohagwu (2015) growing vegetables can be an attractive venture because there relatively short time from planting to harvesting than most crops and there are relatively simple requirements for production. Vegetables as pointed out by Asiegbu (2015) in Asogwa and Ohagwu (2015), may be classified into green or leaf, root, tuber, bulb and fruit vegetables. It is important to note that vegetables are high sources of vitamins and minerals to both man and animals, for this reason the demand is relatively high.

Asouzu (2016) noted that vegetables do well when they are grown using organic manure. Growing vegetables organically requires an additional set of skills and knowledge. Vegetable production is the rational combination of input resources to obtain horticultural crop products. Food and Agricultural Organization FAO (2019) stated that vegetables can make a significant difference to small holder livelihoods. The organization further stated that vegetable production needs only a small area of land, with minimal capital outlay and not only can it provide access to a valuable food under subsistence condition, but also has the potential to provide an initial step, towards establishing an income base for poorer households. Vegetables from a large and diverse commodity group, generally share similarities in cultivation methods, although they do not have botanical features in common. For example, tomatoes, melon and watermelon are commonly classified as vegetables, although traders and consumers commercially classify them as fruits. Accordingly, Uka (2012) observed that most vegetables are bulky and perishable, in contrast to staple foods that can be stored. As a result of improvement in science and technology especially in the area of transportation and communication, vegetable production has improved even in areas where land and climatic conditions are challenging.

Vegetable production is a component of crop production which is a course of study to students of agricultural education in tertiary institution. Agricultural education students are students who underwent four years programme in studying agricultural courses such as animal production, soil science, crop production among others. These students are expected to have mastered activities involved in agriculture theoretically, practically and develop interest in food production. For instance, in the tertiary institutions agricultural skills such as vegetable nursery, pre-planting, planting and post-planting operation are presented to agricultural education students in their four years of study to enable them become self-reliant and contribute meaningfully to development of their society on graduation. In addition, Aneke (2014) noted that agricultural education programme is a course that provides the students with the skills and knowledge in all areas of agricultural activities such as production, processing, marketing among others to equip them on graduation. Akpe (2018) stated that these agricultural activities provide economic substance to many countries. Agricultural education programme is a vocational training programme that provides the students with vocational skills and pedagogical competencies for teaching the agricultural skills. Acquisition of skills in animal production, crop production (vegetables) and

others are presented to students for effective competency development. Skills in vegetables production involve the pre-planting skills, planting skills, post planting and harvesting skills.

Skills according to Mbah and Umurhurhu (2016) are the ability to make purposeful movements that are necessary to complete or master a particular task. Onoh (2021) defined skill as the ability to perform expertly well, with dexterity and tact through what one has learnt and practiced in training. It is the professional abilities to perform or carry out a task very well. Skills acquisition is seen as a major tool for capacity building of students in agricultural science. This study therefore regards skill acquisition as activity designed to expose agricultural education students in pre-planting, planting, post planting and harvesting skills activities in vegetable production for sustainability. The pre-planting skills according to Emeka (2017) include site selection, clearing, gathering the material (input), planning for resources such as fund. The planting skills involves ability to place the vegetables properly, maintain correct spacing, speed treatment before planting among others; while the post plant are all activities such as irrigation, fertilizer application, weed control, staking were necessary, supplying, thinning among others. The agricultural education students are expected to be exposed to these skills during their period of study to make them competently engage, retain and remain self-reliant in vegetable on graduation.

Skill enhancement in the view of Nwobu, Amusa, and Olaitan (2019) and Mbah and Onoh (2016) is effort geared towards improving the level of knowledge, skills and attitude possessed by an individual for proficiency in a given task or job. Improving capacity in vegetable production implies equipping the human capital the skills involved in vegetable production increase the supply of the needed vegetable to the society. In the context of this study, effort is geared towards identifying the vegetable production skills to increase its production. This is pertinent based on the observation by the researchers indicating that there is low supply of required vegetable, which might be as a result of low skill acquired while in tertiary institution. For instance, Oketobo and Okeme (2014) noted that lecturers in the universities emphasis mostly on theory rather than practical and this does not allow the students to acquire relevant skills. Alio and Uzo (2010) noted that this emphasis was laid on theory and this was as a result of what was inherited from the colonial masters who emphasis on liberal course that lack skill acquisition.

The skills involved in vegetable production could be provided to the students in agriculture through the intervention of the extension agents and vegetable farmers who have carried operation for several years. The agricultural extension agents are personnels who are equipped to provide farmers with the technical advice as a guide to improve their farming methods (Aneke, 2014). The extension agents help to educate farmers on improved techniques of farming. They do this through farm and home visit, field demonstration providing useful farm advice and techniques and in the skill acquisition centers among others.

### **Statement of Problem**

Every year thousands of students are turned out into the society where there is no jobs. Nigerian streets are littered with students who ordinarily would have found employment in some agribusinesses organization; or would have demonstrated their skills and resourcefulness if there is enabling environments and reliable management structures on ground.

The researcher deemed it necessary to expose the students to skills involved in vegetable production to keep them engaged and self reliant and even become job creators. Because their, being idle has resulted to their engagement in uncivil attitudes such as kidnapping, armed robbery, militant among others. Organizing and developing skills acquisition programme for agricultural students could be a sure way of solving political, social and economic problems of the nation.

### **Purpose of the Study**

The main purpose of this study was to determine skills needed by agricultural education students for sustainable in vegetable production in Enugu State, Specifically, the study sought to determine the;

1. pre-planting skills needed by agricultural education students for sustainable capacity building in vegetable production in Enugu State.
2. planting skills needed by agricultural education students for sustainable capacity building in vegetable production in Enugu State.
3. post planting skills needed by agricultural education students for sustainable capacity building in vegetable production in Enugu State.
4. harvesting skills needed by agricultural education students for sustainable capacity building in vegetable production in Enugu State.
5. marketing skills needed by agricultural education students for sustainable capacity building in vegetable production in Enugu State.

### **Research Questions**

The following research questions guided the study;

1. What are the pre-planting skills needed by agricultural education students for sustainable vegetable production in Enugu State?
2. What are the planting skills needed by agricultural education students for sustainable vegetable production in Enugu State?
3. What are the post planting skills needed by agricultural education students for sustainable vegetable production in Enugu State?
4. What are the harvesting skills needed by agricultural education students for sustainable vegetable production in Enugu State?
5. What are the marketing skills needed by agricultural education students for sustainable vegetable production in Enugu State?

### **Hypotheses**

The following null hypotheses were tested at 0.05 level of significance.

- Ho<sub>1</sub> There is no significant difference between the mean score of extension agents and vegetable farmers on the pre-planting skills needed by agricultural education students for sustainable vegetable production in Enugu State.
- Ho<sub>2</sub> There is no significant difference between the mean score of extension agents and vegetable farmers on the planting skills needed by agricultural education students for sustainable vegetable production in Enugu State.
- Ho<sub>3</sub> A significant difference does not exist on the mean score of extension agents and vegetable farmers on the post planting skills needed by agricultural education students for sustainable vegetable production in Enugu State.

- HO<sub>4</sub> There is no significant difference between the mean score of extension agents and vegetable farmers on the harvesting skills needed by agricultural education students for sustainable vegetable production in Enugu State.
- HO<sub>2</sub> There is no significant difference between the mean score of extension agents and vegetable farmers on the marketing skills needed by agricultural education students for sustainable vegetable production in Enugu State.

## METHODS

The study adopted a descriptive survey research design. According to Alio (2018) and Nworgu (2015) descriptive survey research design is one in which a group of people or items are studied by collecting and analyzing data from only a few people or items considered to be representative of the entire group or the entire population if it is manageable. The design was appropriate considered appropriate because of the wide distribution of the respondents and the polychotomously structured instrument used for data collection from a sample deemed to be the representative of the population. The area of the study was Enugu State of Nigeria. Enugu State is one of the five States in south-East geopolitical zone of Nigeria. The population for the study comprised of 96 made up of 33 extension agents and 63 registered vegetable farmers in Enugu State (source; Department of Crop Production, Ministry of Agriculture Enugu State (2022)). The number was manageable hence, there was no sampling. A Structured questionnaire containing a total of 42 items was the instrument for data collection. The questionnaire was grouped into two parts. Part A contained the personal data of the respondents and part B contained 42 items grouped into five sections according to the research questions that guided the study. Each item had four response options of Very Highly Required (VHR), Highly Required (HR), Moderately Required (MR) and Not Required (NR), with numerical values of 4, 3, 2, and 1 respectively. The instrument was validated by three experts, two of them were in Electrical/Electronics Technology Education Programme of Department of Technology and Vocational Education and one in Measurement and Evaluation from Department of Computer Science and Mathematics Education all in Faculty of Education, Enugu State University of Science and Technology. The reliability of the instrument was determined by administering 20 copies of the questionnaire to 10 extension agents and 10 registered vegetable farmers in Ebonyi State. The data collected was analyzed using Cronbach Alpha and the reliability coefficient yielded .79. This is in line with Uzoagulu (2011) who noted that reliability coefficient above 0.6 indicates that the instrument is reliable. Out of 96 copies of the questionnaire distributed 89 were properly filled and returned, representing 92.71% return rate. 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 significantly using SPSS.

Decisions were made using the real limits of number on four-point rating scale 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. For the t-test statistics, 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 hypothesis was significant where the probability value was less than the .05 significant level at appropriate degree of freedom, otherwise the null hypothesis was not significant.

## RESULTS OF THE STUDY

The results of the study are presented according to the research questions and hypotheses that guided the study.

### Research Questions 1

What are the pre-planting skills needed by agricultural education students for sustainable vegetable production in Enugu State?

**Table 1: Mean scores and standard deviation on the pre-planting skills needed by agricultural education students for sustainable vegetable production in Enugu State.**

S/N	Pre-planting skills include; ability to;	Extension Agents N= 30		Vegetable farmers N= 59		Overall		Decision
		$\bar{X}_1$	SD <sub>1</sub>	$\bar{X}_2$	SD <sub>2</sub>	$X_G$	SD <sub>G</sub>	
1	formulate specific objectives for vegetable production	3.47	0.64	2.84	0.83	2.87	0.84	HR
2	identify relevant vegetable inputs	3.48	0.56	3.14	0.75	3.25	0.71	HR
3	draw timetable of activities based on the farming	3.47	0.69	3.28	0.81	3.36	0.70	HR
4	choose good topography for vegetable planting	3.33	0.55	3.19	0.75	3.29	0.74	HR
5	choose a farm site that has access to direct sunshine	3.25	0.59	2.94	0.79	2.95	0.78	HR
6	plough and harrow the vegetable farm site	3.43	0.78	2.98	0.82	3.00	0.81	HR
7	choose cultivation pattern according to the soil nature	3.48	0.67	2.84	0.94	2.96	0.94	HR
8	stump the farm site before cultivation	3.26	0.54	2.93	0.95	3.11	0.95	HR
9	source propagation materials	3.08	0.89	2.95	0.78	2.95	0.79	HR
10	form a good vegetable nursery	3.49	0.78	3.08	0.68	3.10	0.69	HR
11	avoid skimp on weed management	3.09	0.86	3.15	0.78	3.08	0.81	HR
<b>Cluster Mean &amp; Standard Deviation</b>		<b>3.35</b>	<b>0.69</b>	<b>3.03</b>	<b>0.81</b>	<b>3.08</b>	<b>0.80</b>	<b>HR</b>

Note: X-Mean; SD Standard Deviation; N-Number of respondents; HR- Highly Required

The result of data analysis on **Table 1** shows that the overall mean scores of the respondents range from 2.87 to 3.36 indicating that the itemized are the pre-planting skills needed by agricultural education students for sustainable vegetable production in Enugu State. The overall cluster mean of 3.08 further shows that the items are highly required. The low cluster standard deviation of 0.80 obtained from data analysis indicates that the respondents have consensus opinion in their responses to the items.

### Hypothesis 1

There is no significant difference between the mean score of extension agents and vegetable farmers on the pre-planting skills needed by agricultural education students for sustainable vegetable production in Enugu State.

**Table 2: Summary of t-test item by item analysis of mean scores of extension agents and vegetable farmers on the pre-planting skills needed by agricultural education students for sustainable vegetable production in Enugu State.**

Status	N	X	Mean Difference	df	T	Sig. (2tailed)	Decision
Extension Agents	30	3.35	3.0727	87	0.37	0.4791	Not significant
Vegetable Farmers	59	3.03			1		

The result of data analysis in **Table 2** shows that the t-value at 0.05 level of significant and 87 degree of freedom for the eight items is 0.371 with significant value of 0.4791. Since the significant value of 0.4791 is more than 0.05 level of significant, the null hypothesis is not the significant. The implication is that there is no significant different in the mean ratings of extension agents and vegetable farmers on the pre-planting skills needed by agricultural education students for sustainable vegetable production in Enugu State. Therefore the null hypothesis is upheld.

### Research Questions 2

What are the planting skills needed by agricultural education students for sustainable vegetable production in Enugu State?

**Table 3: Mean scores and standard deviation on the planting skills needed by agricultural education students for sustainable vegetable production in Enugu State**

S/N	planting skills include; ability to;	Extension Agents N= 30	Vegetable farmers N= 59	Overall	Decision
		$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_G$	
12	trim the vegetables properly	3.27	3.14	3.21	HR
13	space the seeds correctly	3.33	3.38	3.32	HR
14	propagate of the vegetable seed	3.46	3.44	3.46	HR
15	treat the seed correctly	3.32	3.03	3.31	HR
16	conduct/connect a good irrigation system	3.18	3.15	3.16	HR
17	plant considering the vegetable season	3.39	3.08	3.21	HR
	<b>Cluster Mean &amp; Standard Deviation</b>	<b>3.33</b>	<b>3.20</b>	<b>3.37</b>	<b>HR</b>

Note: X-Mean; SD-Standard Deviation; N = Number of respondents; HR = Highly Required

The result of data in **Table 3** analysis shows that the overall mean score of the respondents ranges from 3.16 to 3.46 indicating that the itemized are the planting skills needed by agricultural education students for sustainable vegetable production in Enugu State. The overall cluster mean of 3.37 further shows that the items are highly required. The low standard deviation of 0.83 obtained from data analysis indicates that the respondents have consensus opinion in their responses to the items.

### Hypothesis 2

There is no significant difference between the mean scores of extension agents and vegetable farmers on the planting skills needed by agricultural education students for sustainable vegetable production in Enugu State.

**Table 4: Summary of t-test items by item analysis of mean scores of extension agents and vegetable farmers on the planting skills needed by agricultural education students for sustainable vegetable production in Enugu State.**

Status	N	X	Mean Difference	df	T	Sig. (2tailed)	Decision
Extension Agents	30	3.35	3.0825	87	0.421	0.7151	Not significant
Vegetable Farmers	59	3.20					

The results of data analysis in **Table 4** shows that t-value of 0.05 level of significant and 87 degree of freedom for six items is 0.421 with significant value of 0.7151. Since the significant value of 0.7151 is more than 0.05 level of significant, the null hypothesis is not the significant. The implication is that there is no significant different in the mean scores of extension agents and vegetable farmers on the planning skills needed by agricultural education students for sustainable vegetable production in Enugu State. Therefore, the null hypothesis is upheld.

### Research Questions 3

What are the post planting skills needed by agricultural education students for sustainable vegetable production in Enugu State?

**Table 5: Mean score and standard deviation on the post planting skills needed by agricultural education students for sustainable vegetable production in Enugu State**

S/N	Posting planting skills include; ability to;	Extension Agents N= 30		Vegetable farmers N= 59		Overall		Decision
		$\bar{X}_1$	SD <sub>1</sub>	$\bar{X}_2$	SD <sub>2</sub>	$\bar{X}_G$	SD <sub>G</sub>	
18	practice appropriate irrigation technique	3.35	0.53	3.08	0.81	3.12	0.81	HR
19	drain soil water if moisture is in excess	3.27	0.93	3.24	0.68	3.25	0.76	HR
20	weed the farm with approved method	3.29	0.89	3.19	0.66	3.19	0.67	HR
21	adopt appropriate pest and diseases control method	3.25	0.95	3.09	0.60	3.14	0.61	HR
22	maintain farm hygiene till vegetable harvesting	3.08	0.87	3.15	0.78	3.09	0.78	HR
23	apply fertilizer on the soil according to growth and yield	3.00	0.82	2.95	0.72	2.95	0.78	HR
24	use supporting stake on the vegetables	3.02	0.86	3.19	0.66	3.19	0.68	HR
25	mulching the vegetable	3.27	0.93	3.24	0.68	3.25	0.76	HR
<b>Grand Mean &amp; Standard Deviation</b>		3.18	0.84	3.13	0.70	3.13	0.72	HR

Note: X Mean; SD - Standard Deviation; N = Number of respondents; HR-Highly Required

The result presented in **Table 5** depicts that the respondents overall mean rating ranges from 2.95 to 3.25 which shows that the itemized are the post planting skills highly required by agricultural education students for sustainable vegetable production in Enugu State. The overall cluster mean of 3.13 further indicated that the items are the post planting skills required by agricultural education students for sustainable vegetable production in Enugu State. The low standard deviation of 0.72 shows that the respondents' responses do no differ remarkably.

### Hypothesis 3

There is no significant difference between the mean scores of extension agents and vegetable farmers on the post planting skills needed by agricultural education students for sustainable vegetable production in Enugu State



**Table 6: Summary of t-test analysis on the mean ratings of extension agents and vegetable farmers on the post planting skills needed by agricultural education students for sustainable vegetable production in Enugu State**

Status	N	X	Mean Difference	df	T	Sig. (2tailed)	Decision
Extension Agents	30	3.18	1.2191	87	0.643	0.385	Not significant
Vegetable Farmers	59	3.13					

**Table 6** above shows that the t-value of 0.05 level of significant and 87 degree of freedom for the seven items is 0.643 with significant value of 0.385. Since the significant value of 0.385 is more than the 0.05 level of significant the null hypothesis is not significant. This invariably depicts that there is no significant difference on the mean scores of extension agents and vegetable farmers on the post planting skills needed by agricultural education students for sustainable vegetable production in Enugu State.

#### Research Questions 4

What are the harvesting skills needed by agricultural education students for sustainable vegetable production in Enugu State?

**Table 7: Mean rating and standard deviation on the harvesting skills needed by agricultural education students for sustainable vegetable production in Enugu State**

S/N	Harvesting skills includes ability to;	Extension Agents N= 30		Vegetable farmers N= 59		Overall		Decision
		$\bar{X}_1$	SD <sub>1</sub>	$\bar{X}_2$	SD <sub>2</sub>	$\bar{X}_G$	SD <sub>G</sub>	
26	identify if vegetable are ready to harvest vegetable	3.29	0.82	3.52	0.54	3.41	0.68	HR
27	use cutting tool in vegetable harvesting	3.32	0.92	3.35	0.82	3.34	0.87	HR
28	keep good record of activities as they unfold during harvesting	3.43	0.79	3.30	0.85	3.37	0.87	HR
29	care/maintain equipment used for harvesting	3.14	0.63	3.05	0.96	3.21	0.80	HR
30	draw harvesting time table	3.00	0.88	3.26	0.78	3.13	0.83	HR
31	organise an improved storage system after harvesting	3.48	0.50	3.22	0.72	3.35	0.61	HR
<b>Grand Mean &amp; Standard Deviation</b>		3.29	0.74	3.29	0.78	3.31	0.76	HR

**Note:** X-Mean; SD - Standard Deviation; N-Number of respondents; HR-Highly Required

The result presented in **Table 7** depicts that the respondents overall mean scores ranges from 3.13 to 3.41 which shows that the itemized are the harvesting skills highly needed by agricultural education students for sustainable vegetable production in Enugu State. The overall cluster mean of 3.31 further indicated that the respondents totally agreed to the items as the harvesting skills required by agricultural education students for sustainable vegetable production in Enugu State. The low standard deviation of 0.76 shows that the respondents have homogenous responses to the items.

**Hypothesis 4**

There is no significant difference between the mean scores of extension agents and vegetable farmers on the harvesting skills needed by agricultural education students for sustainable vegetable production in Enugu State

**Table 8: Summary of t-test analysis on the mean scores of extension agents and vegetable farmers on the harvesting skills needed by agricultural education students for sustainable vegetable production in Enugu State**

Status	N	X	Mean Difference	df	T	Sig. (2tailed)	Decision
Extension Agents	30	3.29	1.2191	87	0.893	0.782	Not significant
Vegetable Farmers	59	3.29					

Table 8 above shows that the t-value of 0.05 level of significant and 87 degree of freedom for the 10 items is 0.893 with significant value of 0.782. Since the significant value of 0.782 is more than the 0.05 level of significant the null hypothesis is not significant. This invariably depicts that there is no significant difference on the mean ratings of extension agents and vegetable farmers on the harvesting skills needed by agricultural education students for sustainable vegetable production in Enugu State.

**Research Question 5**

What are the marketing skills needed by agricultural education students for sustainable vegetable production in Enugu State?

**Table 9: Mean rating and standard deviation of the responses on marketing skills needed by agricultural education students for sustainable vegetable production in Enugu State**

S/N	marketing skills required include the ability to;	Extension Agents N= 30		Vegetable farmers N= 59		Overall		Decision
		$\bar{X}_1$	SD <sub>1</sub>	$\bar{X}_2$	SD <sub>2</sub>	$\bar{X}_G$	SD <sub>G</sub>	
32	maintain a good human relation with customers	3.26	0.67	2.92	0.97	2.98	0.76	HR
33	capture customer's interest to buy their vegetable products	3.06	0.55	2.97	1.03	3.01	0.83	HR
34	identify market outlets for vegetable enterprise	3.10	0.71	2.99	0.96	3.17	0.87	HR
35	relate well with competitors	3.06	0.55	3.04	1.01	3.05	0.78	HR
36	establish a good marketing plan	3.28	0.83	2.91	1.03	3.09	0.95	HR
37	package the product very well	3.17	1.03	3.42	0.98	3.27	0.93	HR
38	communicate marketing ideas through written/oral presentation	3.04	0.93	3.18	0.79	3.10	0.81	HR
39	negotiate sales	3.15	1.13	2.93	0.82	3.13	0.84	HR
40	adopt good sale technique	3.42	0.91	3.05	0.96	3.27	0.96	HR
41	handle customers complaints satisfactorily	2.95	0.75	2.91	0.97	2.92	0.87	HR
42	understand the business environment	3.11	1.07	3.07	0.94	3.09	1.01	HR
<b>Grand Mean &amp; Standard Deviation</b>		3.15	0.83	3.04	0.95	3.10	0.96	HR

Note; X Mean; SD-Standard Deviation; HR Highly Required

The data presented in **Table 9** shows that the overall mean for the items ranges between 2.92 to 3.27 indicating that the items are marketing skills needed by agricultural education students for sustainable vegetable production in Enugu State. The cluster mean of 3.10 further indicates that all items are highly required for sustainable vegetable production. The low cluster standard deviation of 0.96 also shows that the respondents do not differ remarkably on the itemized as the marketing skills needed by agricultural education students for sustainable vegetable production in Enugu State.

### Hypothesis 5

There is no significant between the mean responses of extension agents and vegetable farmers on the marketing skills needed by agricultural education students for sustainable vegetable production in Enugu State.

**Table 10: Summary of t-test analysis of mean score of extension agents and vegetable farmers on the marketing skills needed by agricultural education students for sustainable vegetable production in Enugu State.**

Status	N	X	Mean Difference	df	T	Sig. (2tailed)	Decision
Extension Agents	30	3.15	0.42921	87	1.039	1.08	Not significant
Vegetable Farmers	59	3.04					

The result of t-test analysis presented in Table 10 shows that the t-value at 0.05 level of significant and 87 degree of freedom for the items is 1.039 with a significant value of 1.08. Since the significant value of 1.08 is more than the .05 level of significant the null hypothesis is not significant. This indicates that there is no significant difference with the regard to the items on the mean responses of extension agents and vegetable farmers on the marketing skills needed by agricultural education students for sustainable vegetable production in Enugu State.

## DISCUSSION OF FINDINGS

The result of findings from research question one indicated the pre-planting skills needed by agricultural education students for sustainable vegetable production in Enugu State. The identified skills include ability to formulate specific objectives for vegetable production, identified relevant vegetable inputs, draw timetable of activities based on the farming, understand the soil topography in vegetable planting, choose a farm site that with access to direct sunshine, plough and harrow the vegetable farm site, choose cultivation pattern according to the soil nature, stump the farm site before cultivation, source propagation materials, form a good vegetable nursery and avoid skimp on weed management. The findings of the study are in agreement with Alawa and Okeke (2015) that ability formulate specific objectives for vegetable production, identified relevant vegetable inputs and draw timetable of activities based on the farming are among the pre-planting skills needed for coconut farming. The implication of the findings was that the identify highly needed skills should be used in training agricultural education students for sustainable vegetable production. Further, the findings of the study depicted that there is no significant difference between the mean ratings of extension agents and vegetable farmers on the

pre-planting skills needed by agricultural education students for sustainable vegetable production in Enugu State. The implication of no significant difference was that extension agents and vegetable farmers share the same view on the itemized skills as pre-planting skills required by agricultural education students for sustainable vegetable production.

The data obtained in research question two indicated the ability to trim the vegetables properly, space the seeds correctly, propagate of the vegetable seed, conduct/connect a good irrigation system, treat the seed correctly and plant considering the vegetable season are the planting skills needed by agricultural education students for sustainable capacity building in vegetable production in Enugu State. The findings of the study indicated that the farmers and extension agents view the items to be the planting skills needed by agricultural education students for sustainable capacity building in vegetable production in Enugu State. These findings are in line with the findings of Asogwa and Ohagwu (2015) that planning skills cover skills in space the seeds correctly, propagating the vegetable seed and conducting/connecting a good irrigation system. The findings of the study further revealed that there is no significant difference between the mean ratings of extension agents and vegetable farmers on the planting skills needed by agricultural education students for sustainable vegetable production in Enugu State. The implication of no significant difference was that extension agents and vegetable farmers share the same view on the itemized skills as planting skills required by agricultural education students for sustainable vegetable production.

Also, the findings of the study depicted the post planting skills needed by agricultural education students for sustainable vegetable production in Enugu State. The study revealed that the post planting skills highly required for vegetable production include the ability to practice appropriate irrigation technique, drain soil water if moisture is in excess, weed the farm with approved method, adopt appropriate pest and diseases control method, maintain farm hygiene till vegetable harvesting, apply fertilizer on the soil according to growth and yield and use supporting stake on the vegetables. This is in line with Nwobu, Amusa and Olaitan (2019) who noted that vegetable production requires the farmer to have good knowledge of planting skills and ability to maintain farm hygiene till vegetable harvesting. This showed that the identified post planting skills are highly required for effective vegetable production. The identified skills indicated that there is no significant difference between the mean ratings of extension agents and vegetable farmers on the pre-planting skills needed by agricultural education students for sustainable vegetable production in Enugu State. This is an indication that status of the respondents has no significant influence on the itemized post planting skills required for vegetable production.

The result of the study on research question four showed that the listed harvesting skills are needed by agricultural education students for sustainable vegetable production in Enugu State. The result of analysis depicted that the harvesting skills include the ability to identify ready to harvest vegetable, use cutting tool in vegetable harvesting, identify market outlets for vegetable enterprise, keep good record of activities as they unfold during harvesting. Care/maintain equipment used for harvesting, draw harvesting time table and organize an improved storage system after harvesting. The findings of the study was in agreement with Osinem (2018) and Asogwa and Ohagwu (2015) that ability to use cutting tool in vegetable harvesting, identify market outlets for vegetable enterprise and keep good record of activities as they unfold during

harvesting are among the harvesting skills needed for sustainable vegetable production. This indicated that the identified skills are highly required for vegetable production among the agricultural education students. The findings of the study indicated that there is no significant difference between the mean scores of extension agents and vegetable farmers on the identified harvesting skills needed by agricultural education students for sustainable vegetable production in Enugu State. This means that extension agents and vegetable farmers had the same opinion to the items as the harvesting skills highly needed for sustainable vegetable production.

Finally, the findings of the study indicated that the marketing skills needed for sustainable vegetable production include; ability to maintain a good human relation with customers, capture customer's interest to buy their vegetable products, identify market outlets for vegetable enterprise, relate well with competitors, establish a good marketing plan, package the product very well, communicate marketing ideas through written/oral presentation, negotiate sales, adopt good sale technique, handle customers complaints satisfactorily and understand the business environment. The findings of the study showed that marketing skill highly needed for sustainable vegetable production. The findings of the study are in agreement with Onoh (2011) that marketing skills required by entrepreneur must cover good interpersonal relationship, communicating with customers, determining the customers' needs and meeting them satisfactory and understanding the market condition. The implication of this was that the identified marketing skills are highly needed by farmers for selling of their products after harvesting in Enugu State. The result of null hypothesis based on the variable indicated that there is no significant difference between the mean responses of extension agents and vegetable farmers on the marketing skills needed by agricultural education students for sustainable vegetable production in Enugu State.

## **CONCLUSION**

The issue of unemployment and employment of skilled and competent work force in agricultural food production has been of primary concern to Nigerians and Enugu State in particular. This has necessitated studies to determine the skills needed by agricultural education students for sustainable vegetable production. Vegetable production has been identified as a lucrative venture starting from its farming to its marketing. The study therefore identified skills in the areas of pre-planting, planting and post planting, harvesting operation and marketing skills needed by students of agricultural education for successful entry into the vegetable production. The identified skills could be used to develop training and retraining programme for the students and agricultural skill acquisition. Further, the identified skills could be added in the curriculum for training students in agro-entrepreneurship skill development for sustainable vegetable production.

## **Recommendations**

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

1. The curriculum designers should consider the identified skill areas in developing the curriculum for training students in vegetable production,
2. The lecturers of agricultural education programme should ensure that the identified skills are used in teaching the students in crop production course of study.
3. The government should ensure that the skills needed for vegetable production are incorporated in the quality training and retraining of the students.

4. The Ministry of Education should use the findings of this research as a base to organize seminar, conferences and workshops for retraining of teachers/lecturers in Agricultural Education.

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