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ENHANCING AGRICULTURAL EDUCATION STUDENTS' PARTICIPATION IN HORTICULTURE FOR ECONOMIC SUSTAINABILITY IN RIVERS STATE

BY

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Abstract

The study assessed Agricultural Education students' Participation in Horticulture for Economic Sustainability in Rivers State. Three specific objectives, research questions and hypotheses guided the study. The study adopted a descriptive research design with a population of one hundred and fifty-four (154). 15 Agricultural Education lecturers and 64 final year students from Ignatius Ajuru University of Education (IAUE), 5 lecturers and 16 final year Agricultural Education Students from Rivers State University, Port Harcourt and 24 Agricultural Education lecturers and 30 Agricultural Education final year students from FCE(T) Omoku. The instrument used for data collection was a questionnaire titled "Enhancing Agricultural Education Students' Participation in Horticulture for Economic Sustainability Questionnaire" (EAESPHESQ). The instrument provided responses to the 3 research questions with 20 items on a 4-point rating scale of Very High Extent (VHE-4), High Extent (HE-3), Low Extent (LE-2) and Very Low Extent (VLE-1). The instrument was validated by 3 Agricultural Education lecturers in the three Universities studied. Data collected were analyzed using Mean and Standard Deviations for the research questions while z-test was used to test the hypotheses at 0.05 level of significance. Findings from the study revealed that Agricultural Education students to a high extent enhanced participation in the production of vegetable, fruits and medicinal plant for economic sustainability in Rivers State. Based on the findings, it was recommended that students should be more exposed to hands-on experiences in vegetable production, processing and marketing as it will make them more employable leading to economic sustainability, more practical learning should be encouraged in the three institution as it will aid students' income generation through the sales of fruits, leading to economic well-being and sustainability, lastly, lecturers in the three institutions should intensify efforts in introducing different medicinal plants to students in course of learning as it will enable them to be abreast with economic sustainability.

Keywords: Agricultural Education, Horticulture, Students Participation, Economic Sustainability

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Introduction

Agriculture is seen as the bedrock of production of food and allied products on which human existence deepens. Engler and Kretzer (2014) opined that agriculture is expected to guarantee food security, unfortunately, improper resource utilization and over-exploitation has caused attendant negative impact on the environment with the attendant food scarcity. According to Paisley (2014), under normal situation, with necessary knowledge and skills through formal agricultural education, students should perform better in terms of prudent resource management. Agricultural education is a type of vocational training geared towards equipping learners with the knowledge and skills in productive agriculture; the training of both the head and the hands of the learners (Olusoga, 2014). Olusoga (2014) further stated that agricultural education is skill-oriented and apart from training in terms of pedagogy, it provides avenue through which knowledge abilities and skills of beneficiaries could be increased towards attainment of economic sustainability. Therefore, agricultural education students ought to acquire both technical knowledge and entrepreneurial skills to be able to train others. The knowledge and skills acquired by agricultural education students could be useful in raising awareness among other members of the society on better ways of conserving our nature by participating in training practices that are socially and environmentally friendly. Agricultural education students are students who undergo four-years programme in studying agricultural courses such as animal production, soil science, crop production amongst others (Aneke & Nwobi, 2024). These students are to master activities involved in agriculture theoretically, practically and develop interest in food production. Aneke (2024) 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 amongst others to equip them upon graduation. According to Akpe (2018), agricultural activities provide economic sustainability to many countries. Therefore, the need for students to effectively participate in agricultural activities.

Participation entails the ability of people to have an input in decision-making process and play a role in certain measures towards specific targets (Adesina & Eforuoke, 2016) asserted that agricultural education students would participate effectively towards achieving economic sustainability. A critical look at agriculture with the attendant global emphasis by several nations confirm that it seeks to simultaneously help in meeting the tripartite objectives of poverty reduction, food security and environmental sustainability. Therefore, meeting the current and future needs for food requires rapid increase in agricultural education student's participation in horticultural production as it will enhance their economic sustainability.

The relative profitability of horticulture crop compared to cereals has been shown to be a determining factor for crop diversification into horticultural production in India (Mwenda, 2014). Trade in horticultural production such as fruiting, vegetable, floriculture amongst others is often considered an example of successful exports in some African countries with some of them managing to gain access into the horticultural value chain (Maxwell in Mwenda, 2014). Sustainable horticulture practices are crucial for reducing the environmental effects of conventional horticultural techniques while preserving ecological balance and long-term agricultural yield (Kumar, et al. 2023).

Adopting environmentally friendly methods in horticulture is becoming increasingly important as the need for sustainable development and environmental stewardship is recognized on a worldwide scale. Sustainable horticulture practices place a higher priority on the preservation of natural resources, the promoting of ecosystem health and the reduction of harmful environmental effects (Kuamr et al 2023). There is therefore need for Agricultural

Education students to enhance their participation in horticultural production such as vegetable production, fruit production, and medicinal plant production amongst others for economic sustainability.

Agricultural Education Student's Enhanced Participation in Vegetable Production for Economic Sustainability

Vegetable production is a part of crop production that deals with growing of vegetable as horticultural food crops. Vegetables are food crops which have their edible portions characterized by high moisture content, high level of vitamins and minerals (Aneke & Nwobi, 2024). Asogwa and Ohagwu (2015) opined that growing vegetables can be an attractive venture because they are relatively short termed from planting to harvesting them, most crops have relatively simple requirements for production. Vegetables could be classified into green or leaf, root, tuber bulb and fruit vegetables. It is imperative to note that vegetables are both sources of vitamins and minerals for this reason, the demand is relatively high.

Vegetable production is a component of horticultural production which is a course of study to students of Agricultural Education in tertiary institutions in Nigeria. For instance, in tertiary institutions, agricultural skills such as vegetable nursery, pre-planting, planting and post-planting operations are presented to Agricultural Education students in their four years of study to enable them to become self-reliant and contribute meaningfully to development of their society on graduation. Vegetables are good sources of protein, mineral salts, sugars, vitamins and essential oils that increase man's resistance to diseases. They constitute between 30% and 50% of iron and vitamins A in resource poor diet (Christian in Sanus, Ashaolu, Akogun & Ayinde, 2015). Leafy vegetables are an important feature of Nigeria's diet such that a traditional meal without vegetables is assumed to be incomplete.

In developing countries such as Nigeria, the consumption of vegetables in generally lower than the food Agriculture Organization's recommendation of 75kg per year, i.e, 206g per day, per capita (Badmus & Yekini, 2011), revealed that vegetables are the most affordable and accessible sources of micro-nutrients, and its production is increasing in developing countries. In Nigeria, the trend in vegetable production has shown an undulating pattern; for instance, in 2005, about 4,924.9 thousand tones were produced while 2,487.7 thousand tones were produced in 2006 (Ogunbo, Ayinde, Afolami & Banmeke, 2015). Mlozi in Sanusi et al (2015) asserted that increase in vegetable production improved food security and offer employment opportunities to many rural women in Nigeria. Vegetable production in Nigeria is characterized by use of crude implements, non-availability of inputs, illiteracy, expensive and complex technologies (Ogunbo et al 2015).

Vegetable production can be targeted towards poverty alleviation, nutrition and food security programmes in developing nations due to its numerous importance. It increases farmer's access to cash for necessities of life and promotes farm operation. Vegetables do not serve as means of livelihood of farmers alone, but to many intermediaries such as wholesalers, retailers and farm agents who are involved in its value chain and responsible for its movement from the farmer to the consumers (Mukaila, et al., 2022). Therefore, vegetable production has a great tendency to curb the problem of malnutrition and high poverty rate among rural people (Imathiu, 2021). Vegetable farming and production has been ongoing and serving as means of employment for the growing population, especially dry season vegetable farming (Mukaila, et al., 2021). Vegetables are easily grown, require little production input, rich in minerals and vitamins, have an anti-oxidant property and contain photochemical. Apart from the economic importance of vegetable crops, they form part of the daily human

diet globally, supporting the body with nutrients necessary for a healthy life (Ngegba, et al., 2016). According to Rahman, (2020), Agricultural Education students can enhance their participation in vegetable production for economic sustainability by acquiring practical skills, applying theoretical knowledge, starting small-scale vegetable farms, developing value-added products, adopting precision agriculture, developing mobile apps and digital platforms. They can also enhance their participation in vegetable production by conducting workshops and training programmes, providing extension services amongst others. Another type of horticultural production practiced by Agricultural Education student is fruit production.

Agricultural Education Students' Enhanced Participation in Fruit Production for Economic Sustainability

In horticulture, the term "fruit tree" only considers those that provide fruit for human and animals. Fruit tree bears fruit consumed by humans and animals. Globally, fruits constitute important biological resources in various agro-ecological systems (Har & Hughes in Nalumu 2018). Mango, Pawpaw, avocado, orange, and banana e t c. are some of the fruits produced in Nigeria (Nalumu, 2018). The impact of fruit crop production goes far beyond just providing food; it is a vital source of income and sustenance for the local population. For some families, fruit farming is the primary means to earning a living. Neba (2021) opined that the income generated from selling fruit crops allows households to improve their living conditions, invest in their children's education and access healthcare. Beyond individual families, the revenue from fruit sales boosts the local economy by increasing the demand for goods and services, creating a ripple effect on economic benefits throughout the region (Tionwa, et al., 2024).

Fruit farming plays an important role in employment and sustainability as the entire agricultural value chain in Rivers State from growing and harvesting to processing and marketing provides a wide range of job opportunities (Tionwa et al, 2024). Aside employment and sustainability, fruit farming is essential for food security as the fruits produced provides nutritious food options for local people while the income from fruit sales enable families to purchase other food items, ensuring a more balance diet (Tekeu & Fomukong, 2016). In Nigeria, various tropical fruit trees have high root intensity and capacity to bind soil particles together (Awodoyin, et al., 2015). Fruit tree-based agroforestry designs have the capacity to mitigate climate change by considering food security and livelihood necessities for both small and large-scale farmers (Syampujani in Nalumu, 2018). Agricultural Education students can enhance their participation in fruit production by collaborating with local farmers, developing business plan, seeking mentorship and guidance as well as by embracing technology and innovation (Azim 2022). Another type of horticulture production practiced by Agricultural Education students is medicinal plant production.

Agricultural Education Students' Enhanced Participation in Medicinal Plant Production for Economic Sustainability

Integrating practical knowledge and experiential learning has become increasingly important in educational settings. In view of that, using family medicinal plant has emerged as a promising initiative to enhance student's skills and knowledge. The integration of medicinal plant production within educational curricular presents a unique opportunity to nurture diverse skill sets while imparting valuable insights into traditional herbal medicine practice (Orr, et al., 2021). Orr et al (2021) further stated that an innovative approach enriches academic learning and provides a hands-on experience for students to engage with nature, fostering a deeper understanding of ecological sustainability and traditional healing methodologies. Suntar (2020) opined that by incorporating medicinal plant into educational

frameworks, institutions aim to equip students with practical skills, promoting a comprehensive understanding of the environment, cultural heritage and the significance of herbal remedies.

Medicinal plants are gaining popularity globally as a source of raw material for pharmaceuticals and traditional healthcare system (Kandari et al., 2012). More than 85% of herbal medicines uses in traditional healthcare system are derived from medicinal plants and ensure the livelihoods of millions of people, especially in the Indian Himalayan region (Phondani, et al., 2014). Medicinal plants continue to be a critical element of human healthcare systems in many parts of the world with about 80% of the world's population depending solely on traditional remedies for healthcare and an important component of global biodiversity (Ekor, 2014). Ekor (2014) further stated that over four billion people (80% of the world's population) living in the developing world depends on plant products as their main sources of healthcare

The use of traditional medicine is not limited to developing countries alone as over the past two decades, herbal medicine practice and the use of natural therapies have increased significantly in industrialized countries (Tangkiatkumbai, et al., 2020). Pharmaceutical companies use medicinal plants as starting material for the production of other semi-synthetic pharmacologically active substances as seen in many drugs as about thirty percent of drugs sold worldwide contain compounds derived from plant material (Hao, et al., 2020). Medicinal plants are used to increase nutrition (papaya, cucumber, spinach), cook herbs or spices (turmeric, ginger, lemongrass, bay leaves), adds beauty (rose, jasmine, sunflower, hibiscus) amongst others (Fairatul, et al., 2023). Medicinal plants can be planted in pots or on the ground and if the land planted is large enough, part of the harvest can be sold which will bring about economic sustainability in the family (Anwar, et al., 2021). The use of plants as alternative medicines is based on the high level of herbal medicines that are starting to be promoted among the public (Faizatul Set al., 2023). Rulia in Faizatul et al., (2023) observed that many herbal products are being developed and cultivated among the public. The increasing use of herbal medicines worldwide is inversely proportional to people's awareness of producing their own herbal medicines (Suntar, 2020).

The demand of medicinal plants increased all over the world as 70% of the plant species are used in the preparation of medicines, cosmetic and other plant related products (Leaman in Anwar & Muhammad, 2015). Medicinal plants provide critical livelihood support as well as affordable and culturally relevant sources for healthcare to a large number of South Asian's poor (Anwar & Muhammad, 2015). Presently, 90% of medicinal plants are collected from the wild which generates about 40 million man-days employment (Tiwri, et al., 2013). The overall economic value of medicinal plants and plant products cannot be overlooked as ethnobotanicals are a major source of income and an alternative livelihood that provides employment and economic sustainability for millions of people in developing and developed nations and contributes significantly to the Gross Domestic Product of the nations. Agricultural Education students can enhance their participation in medicinal plant production by nurturing diverse skill sets, imparting valuable insights into traditional herbal medicine, collaborating with local farmers, developing business plan, seeking mentorship and guidance, embracing technology as well as embracing innovation(Kumar (2020). Agricultural Education students can also enhance their participation in medicinal plant production by engaging in research and development.

Statement of the Problem

The participation of Agricultural Education students in horticultural production remains a significant concern in Rivers State, Nigeria. Despite the importance of horticulture in promoting economic sustainability, students' involvement in this sector is limited. Rahman, (2022) noted that the low participation rate can be attributed to inadequate practical training, insufficient exposure to modern horticultural practices and lack of empowerment programs. This scenario not only hinders the students' potential to contribute to the state's economic development but also affects their employability and entrepreneurship capabilities in the horticultural industry. The question then is, to what extent, has Agricultural Education students enhance their participation in horticultural production such as vegetable production, fruit production amongst others? In a bid to answer this question amongst other prompted a study of this nature,

Aim/Objectives of the Study

The main aim of the study is to examine the Agricultural Education students' enhancement in the participation of horticultural production for economic sustainability in Rivers State, specifically, the study sought to:

i. examine the extent to which Agricultural Education students' participation in vegetable production for economic sustainability in Rivers State.
ii. examine the extent to which Agricultural Education students' participation in fruit production for economic sustainability in Rivers State.
iii. examine the extent to which Agricultural Education students' participation in medicinal plant production for economic sustainability in Rivers State.

Research Questions

The following research questions guided the study.

i. To what extent has Agricultural Education students' participation in vegetable production for economic sustainability in Rivers State?
ii. To what extent has Agricultural Education students' participation in fruit production for economic sustainability in Rivers State?
iii. To what extent has Agricultural Education students' participation in medicinal plant production for economic sustainability in Rivers State?

Hypotheses

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

Ho_1: There is no significant difference in the mean responses of Agricultural Education lecturers and students in Ignatius Ajuru University of Education and Rivers State University on the extent to which Agricultural Education students enhance their participation in vegetable production for economic sustainability in Rivers State.

Ho_2: There is no significant difference in the mean responses of Agricultural Education lecturers and students in Ignatius Ajuru University of Education and Rivers State University on the extent to which Agricultural Education students enhance their participation in fruit production for economic sustainability in Rivers State.

Ho_3: There is no significant difference in the mean responses of Agricultural Education lecturers and students in Ignatius Ajuru University of Education and Rivers State University on the extent to which Agricultural Education students enhance their participation in medicinal plant production for economic sustainability in Rivers State.

Methodology

The study adopted a descriptive survey research design. The population of the study comprised of 15 Agricultural Education lecturers and 64 final year Agricultural Education students from Ignatius Ajuru University of Education, 5 Agricultural Education lecturers and 16 final year students from Rivers State University, Port Harcourt, 24 Agricultural Education lecturers from FCE(T) Omoku in affiliation with University of Nigeria Nsuuka and 30 final year students of FCE(T) Omoku in affiliation with UNN. Giving a total population of 154 Agricultural Education lecturers and students from the 3 universities studied. The choice of year 4 Agricultural Education students is that they have been in the school system for a good number of years, therefore, should be able to give a concrete response as to how their participation in horticulture enhance economic sustainability in the study area. The population of the study was of manageable size; therefore, census sampling technique was adopted. The instrument used for data collection was a structured questionnaire titled: Enhancing Agricultural Education Students' participation in Horticulture for Economic Sustainability Questionnaire (EAESPHESQ)". The instrument provided responses to the three research questions with 20 items on a 4-point rating scale of Very High Extent (VHE-4 points), High Extent (HE-3 points), Low Extent (LE-2 points) and Very Low Extent (VLE-1 Point). The instrument was validated by 3 Agricultural Education lecturers each of the 3 universities under the study. Data collected were analyzed using Mean and Standard Deviation to answer the research questions, while the three hypotheses were tested using z-test. The decision rule is that any item with the mean value of 2.50 and above indicates high extent while any item less than 2.50 indicates low extent. Similarly, the decision rule for the hypotheses was that any hypothesis which z-calculated value is less than the z-critical table value of 1.96 is considered accepted whereas if it is more than the critical value, it is considered rejected.

Table 1: Population Distribution table

S/N	Institution	Lecturers	Students
1	IAUE	15	64
2	RSU	5	16
3	FCE(T) Omoku in affiliation with UNN	24	30
	Total	**44**	**110**

Source: ***Departmental Records 2024/2025 Academic Session***

Results

The following results were presented according to each research questions.

Research Question 1: To what extent has Agricultural Education students enhanced their participation in vegetable production for economic sustainability in Rivers State?

Table 2: Mean and standard deviation responses on the extent Agricultural Education students participate in vegetable production for economic sustainability in Rivers State

S/N	Items	Agric. Edu. Lecturers (44)			Agric. Edu. Students (110)		
		$\bar{X}_1$	*SD*	RMKS	$\bar{X}_2$	*SD*	RMKS
1	Acquiring practical skills	3.10	0.78	HE	3.21	0.80	HE
2	Applying theoretical knowledge	3.29	0.82	HE	3.10	0.78	HE
3	Starting small-scale vegetable farms	2.90	0.73	HE	3.52	0.88	VHE
4	Developing value-added products	3.42	0.86	HE	3.21	0.80	HE
5	Adopting precision agriculture	3.16	0.79	HE	3.00	0.75	HE
6	Developing mobile apps and digital Platforms	3.12	0.78	HE	2.98	0.75	HE
7	Conducting workshops	3.88	0.97	VHE	3.51	0.88	VHE
8	Providing extension services	3.15	0.79	HE	3.10	0.78	HE
	Grand Mean/SD	**3.25**	**0.81**	**HE**	**3.20**	**0.80**	**HE**

Sources: Field Report, 2025

Table 2 revealed that the respondents indicated high extent to how enhanced their participation in vegetable production has sustained them economically. They agreed to a high extent that acquiring practical skills, applying theoretical knowledge, starting small-scale vegetable farms, developing value-added products, adopting precision agriculture, developing mobile apps and digital platforms, conducing workshops and providing extension services will enhance their participation in vegetable production for economic sustainability. The analysis revealed a grand mean of 3.25 and 3.20 and a grand standard deviation of 0.81 and 0.80 respectively for agricultural education lecturers and students which also indicated that the respondents to a high extent agreed that enhanced participation in vegetable production will economically sustain them in Rivers State.

Research Question 2: To what extent has Agricultural Education students enhanced their participation in fruit production for economic sustainability in Rivers State?

Table 3: Mean and standard deviation responses on extent Agricultural Education students participate in fruit production for economic sustainability in Rivers State

S/N	Items	Agric. Edu. Lecturers (44)			Agric. Edu. Students (110)		
		$\bar{X}_1$	*SD*	RMKS	$\bar{X}_2$	*SD*	RMKS
1	Collaborating with local farmers	3.20	0.80	HE	3.33	0.83	HE
2	Developing business plan	3.18	0.79	HE	3.00	0.75	HE
3	Seeking mentorship and guidance	3.40	0.85	HE	3.22	0.81	HE
4	Embracing technology	3.32	0.83	HE	3.15	0.78	HE
5	Embracing innovation	3.44	0.86	HE	3.41	0.85	HE
	Grand Mean $\bar{X}$ /SD	**3.31**	**0.83**	**HE**	**3.22**	**0.81**	**HE**

Sources: Field Report, 2025

Table 3 revealed that the respondents indicated high extent to how enhanced their participation in fruit production has sustained them economically. They agreed to a high extent that collaborating with local farmers, developing business plans, seeking mentorship and guidance, embracing technology and embracing innovation will enhance their participation in fruit production for economic sustainability. The analysis revealed a grand mean of 3.31 and 3.22 and a grand standard deviation of 0.83 and 0.81 respectively for agricultural lecturers and students which also indicated that the respondents to a high extent agreed that enhanced participation in fruit production will economically sustain them in Rivers State.

Research Question 3: To what extent has Agricultural Education Students enhanced their participation in medicinal plant production for economic sustainability in Rivers State?

Table 4: Mean and standard deviation responses on extent Agricultural Education Students enhanced their participation in medicinal plant production for economic sustainability in Rivers State.

S/N	Items	Agric. Edu. Lecturers (44)			Agric. Edu. Students (110)		
		$\bar{X}_1$	*SD*	RMKS	$\bar{X}_2$	*SD*	RMKS
1	Nurturing diverse skill sets	3.25	0.81	HE	3.99	0.99	VHE
2	Imparting valuable insights into traditional herbal medicine	3.00	0.75	HE	3.54	0.88	VHE
3	Collaborating with local farmers	3.21	0.80	HE	3.00	0.75	HE
4	Developing business plan	3.13	0.78	HE	3.11	0.78	HE
5	Seeking mentorship and guidance	3.11	0.78	HE	3.00	0.75	HE
6	Embracing technology	3.20	0.80	HE	3.18	0.79	HE
7	Engaging in research and development	3.25	0.81	HE	3.33	0.83	HE
8	Embracing innovation	3.12	0.78	HE	3.30	0.82	HE
	Grand Mean $\bar{X}$ /SD	**3.16**	**0.79**	**HE**	**3.31**	**0.83**	**HE**

Sources: Field Report, 2025

Table 4 revealed that the respondents indicated high extent to how enhanced their participation in medicinal plant production has sustained them economically. They agreed to a high extend that nurturing diverse skill sets, imparting valuable insights into traditional herbal medicines, collaborating with local farmers, developing business plans, seeking mentorship and guidance, embracing technology, engaging in research and development and embracing innovation will enhance their participation in medicinal plant production for economic sustainability. The analysis revealed a grand mean of 3.16 and 3.31 and a grand standard deviation of 0.79 and 0.83 respectively which also indicated that the respondents to a high extent agreed that enhanced participation in medicinal plant production will economically sustain them in Rivers State.

Test of Hypotheses

HO1: There is no significant difference in the mean responses of Agricultural Education lecturers and students in Ignatius Ajuru University of Education and Rivers State

University on the extent to which Agricultural Education students enhance their participation in vegetable production for economic sustainability in Rivers State.

Table 5: z-test analysis on difference in the mean responses of Agricultural Education lecturers and students in Ignatius Ajuru University of Education and Rivers State University on the extent to which Agricultural Education students' participation in vegetable production for economic sustainability in Rivers State.

Variables	N	Mean ($\bar{X}$)	SD	Df	Sig.	z-cal	z-crit.	Decision
Lecturers	110	3.25	0.81	87	0.05	0.25	1.95	Accepted
Students	44	3.20	0.80					

Sources: Field Report, 2025

Table 5 revealed at 87 degrees of freedom with a calculated z-cal of 0.25 which is less than the critical value of 1.96 at 0.05 level of significance, the hypothesis is accepted. This means that there was no significant difference in the mean responses of Agricultural Education lecturers and students on the extent to which they can be enhanced in the participation of vegetable production for economic sustainability in Rivers State.

HO_2: There is no significant difference in the mean response of Agricultural Education lecturers and students in Ignatius Ajuru University of Education and Rivers State University on the extent to which Agricultural Education students enhance their participation in fruit production for economic sustainability in Rivers State.

Table 6: z-test analysis on the mean response of Agricultural Education lecturers and students in Ignatius Ajuru University of Education and Rivers State University on the extent to which Agricultural Education students' participation in fruit production for economic sustainability in Rivers State.

Variables	N	Mean ($\bar{X}$)	SD	Df	Sig.	z-cal	z-crit.	Decision
Lecturers	110	3.31	0.83	87	0.05	0.16	1.96	Accepted
Students	44	3.81	0.81					

Sources: Field Report, 2025

Table 6 revealed at 87 degrees of freedom with a calculated z-cal of 0.16 which is less than the critical value of 1.96 at 0.05 level of significance, the hypothesis is accepted. This means that there was no significant difference in the mean responses of Agricultural Education lecturers and students on the extent to which they can be enhanced in the participation of fruit production for economic sustainability in Rivers State.

HO_3: There is no significant difference in the mean responses of Agricultural Education lecturers and students in Ignatius Ajuru University of Education and Rivers state University on the extent to which Agricultural Education students enhance their participation in medicinal plant production for economic sustainability in Rivers State.

Table 7: z-test analysis on the mean responses of Agricultural Education lecturers and students in Ignatius Ajuru University of Education and Rivers state University on the extent to which Agricultural Education students' participation in medicinal plant production for economic sustainability in Rivers State.

Variables	N	Mean ($\bar{X}$)	SD	Df	Sig.	z-cal	z-crit.	Decision
Lecturers	110	3.16	0.79	87	0.05	0.87	1.96	Accepted
Students	44	3.31	0.83					

Sources: Field Report, 2025

Table 7 revealed at 87 degrees of freedom with a calculated z-cal of 0.87 which is less than the critical value of 1.96 at 0.05 level of significance, the hypothesis is accepted. This means that there was no significant difference in the mean responses of Agricultural Education lecturers and students on the extent to which they can be enhanced in the participation of medicinal plant production for economic sustainability in Rivers State.

Discussion

Discussion of the study is done according to the research questions posed in the study.

Findings in research question one revealed that the enhanced participation of Agricultural Education students in vegetable production sustained them economically. In same vein, the hypothesis testing indicated that there is no significant difference in the mean responses of Agricultural Education lecturers and students from Ignatius Ajuru University of Education and Rivers State University on the extent to which Agricultural Education students enhance their participation in vegetable production for economic sustainability in Rivers State. The findings agree with the views of Rahman (2020) who stated that Agricultural Education students can enhance their participation in vegetable production for economic sustainability by acquiring practical skills, applying theoretical knowledge, starting small-scale vegetable farms, developing value-added products, adopting precision agriculture, developing mobile apps as well as digital platforms.

Findings in research question two revealed that the enhance participation of Agriculture education students in fruit production sustained them economically. Similarly, the hypothesis testing indicated that there is no significant difference in the mean responses of Agricultural Education lecturers and students from Ignatius Ajuru University of Education and Rivers State University on the extent to which Agricultural Education students can enhance their participation in fruit production for economic sustainability in Rivers State. The findings align with Azim, (2022) who opined that Agricultural Education Students can enhance their participation in fruit production for economic sustainability by collaborating with local farmers, developing business plan, seeking mentorship and guidance as well as embracing technology and innovation.

Findings in research question three revealed that the enhanced participation of Agricultural Education students in medicinal plant production sustained them economically. Similarly, the hypothesis testing indicated that there is no significant difference in the mean responses of Agricultural Education lecturers and students from Ignatius Ajuru University of Education and Rivers State University on the extent to which Agricultural Education students enhance their participation in medicinal plant production for economic sustainability in Rivers State. The findings collaborate with that of Kumar (2020) who asserted that Agricultural Education students can enhance their participation in medicinal plant production for economic sustainability by nurturing diverse skill sets, imparting valuable insights into traditional

herbal medicine, collaborating with local farmers, developing business plan, seeking mentorship and guidance, embracing technology, engaging in research and development as well as embracing innovation.

Conclusion

Based on the findings of the study, it was concluded that Agricultural Education students' enhanced participation in vegetable production, fruit production and medicinal plant production and will economically sustain them in Rivers State.

Recommendations

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

1. Students should be more exposed to hands-on experience in vegetable production, processing and marketing as it will make them more employable leading to economic sustainability
2. More practical learning should be encouraged in schools as it will aid student's income generation through the sales of fruits leading to economic well-being and sustainability
3. Lecturers should intensify efforts in introducing different medicinal plants to students in course of learning as it will enable them to be abreast with them for economic sustainability.

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