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THE ROLE OF TEACHING METHODS IN AGRICULTURAL EXTENSION AND SKILL DEVELOPMENT FOR OKRA PRODUCTION IN NIGERIAN COLLEGES OF AGRICULTURE

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Abstract: This study assessed the effectiveness of agricultural extension teaching methods in facilitating students' skill acquisition for okra (Abelmoschus esculentus) production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria. Six research questions, six hypotheses and descriptive survey design were used for the study. The population comprised 389 final-year students from Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA), with 186 and 203 students, respectively. A sample of 349 students (166 from ASCOA and 183 from YSCA) was randomly selected. A 60-item questionnaire consisting of seven sections and 5-point rating scale used for data collection was faced validated by three experts. Cronbach's alpha yielded an overall reliability index of .80, with section-specific indices of .79, .72, .84, .77, .86 and .81 for section B, C, D, E, F and G respectively indicating that the instrument was reliable. Research questions were analyzed using Mean and Standard Deviation, and independent t-tests were applied to test hypotheses at a .05 significance level. The results indicated that demonstration, lecture, discussion, inquiry-based, project-based, and cooperative teaching methods were effective in enhancing students' skills for okra production. No significant difference was found in students' responses regarding the effectiveness of these methods. Based on these findings, it is recommended that COAs implement a robust monitoring and evaluation system to regularly assess teaching methods and curriculum content. Periodic curriculum revision, based on feedback from students, industry stakeholders, and educational assessments, is also advised to meet evolving agricultural education needs.
Keywords: Agricultural Extension, Teaching Methods, Skill Acquisition, Okra Production, Colleges of Agriculture, Nigeria.

Introduction

Nigeria, Africa's most populous country, had an estimated population of 201 million in 2019 (FAO, 2019). With a land area of 911,000 square kilometers, 78% of this is dedicated to agriculture, which employs 36% of the workforce (FAO, 2019). Agriculture remains crucial to Nigeria's economy, contributing 21% of GDP in 2018,

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while petroleum, traditionally seen as the country's economic backbone, contributed less than 9% (NBS, 2019). The agricultural sector includes crop production, fishing, livestock, and forestry, and provides over 75% of Nigerians with their livelihoods (Sobowale et al., 2020). From January to March 2021, agriculture contributed 22.35% to GDP, with crop production alone contributing 87.6% of agricultural output, while livestock, fishing, and forestry accounted for 8.1%, 3.2%, and 1.1%, respectively (FAO, 2021; Taiwo, 2020).

Crop production plays a key role, providing food, jobs, and raw materials for industries. Common crops include pumpkin, okra, cassava, and maize (Tijani & Kehind, 2022). Okra, or Abelmoschus esculentus, originated in Ethiopia and spread across North Africa, the Mediterranean, and India by the 12th century BC (Pandey et al., 2017). Recognized for its adaptability, okra thrives in sandy loam soil with a slightly acidic pH and temperatures between 20°C and 30°C (Nisar et al., 2021). Okra cultivation supports both small-scale farmers and commercial operations in Nigeria, where it is a major vegetable crop (Oladejo, 2014; Udemezue, 2017). Okra's versatility makes it a popular choice for both human consumption and livestock feed (Osalusi et al., 2019). It is nutrient-rich, containing magnesium, vitamins C and K1, folate, and antioxidants, which contribute to various health benefits, such as supporting cardiovascular health and potentially reducing cancer risks (Natalie, 2023). Okra's nutrient content includes essential elements like calcium, protein, carbohydrates, and iron (Omoniyi et al., 2020). In Nigeria, different varieties like white velvet and lady finger are cultivated year-round across approximately 2 million hectares (Ekunwe, 2018). Nigeria is the largest okra producer in West Africa, with production at 1.9 million tons, surpassing neighboring countries (FAO, 2021).

Globally, okra production reached over 10.8 million tons in 2021, with India, Sudan, and Pakistan as top producers (FAO, 2021). However, West Africa, despite accounting for 75% of Africa's okra output, has a relatively low productivity rate of 2.5 tons per hectare, compared to 6.2 and 8.8 tons per hectare in East and North Africa (FAO, 2021). In Nigeria, okra ranks third among vegetables in terms of consumption after tomatoes and peppers (Tijani & Kehind, 2022). Okra's economic impact extends beyond its culinary uses; it provides significant income for farmers, supporting household food security (Amadi, 2023). Essential skills for okra farming include site selection, seed treatment, soil sterilization, pest control, and proficiency in post-harvest processes (Amadi, 2023). Despite its benefits, okra production faces several challenges. Issues such as limited access to land, labor, and markets hinder productivity (Udemezue, 2017; Ume et al., 2018). High unemployment rates in Nigeria further reflect the inadequacies in skill acquisition programs, which fail to align with educational curricula (ILO, 2013). Constraints in okra farming include pest infestations, low-quality planting materials, inadequate infrastructure, and limited access to credit and extension services (Imoloame & Olanrewaju, 2014). These challenges highlight the importance of a targeted approach to agricultural education, emphasizing hands-on skills and entrepreneurship (Ali-Olubanwal, Kathuri, & Wesonga, 2011).

Agricultural education is critical in equipping learners with practical farming skills and teaching strategies (Nwakile et al., 2020). Extension systems are pivotal for disseminating modern agricultural technologies and

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provide farmers with training on improved techniques (Okunade, 2017). This educational approach aims to boost productivity, increase income, and enhance living standards (Onyia, Eze, & Agbo, 2024). In Nigeria, the agricultural curriculum is structured to address local challenges, preparing students for the realities of modern farming (Onyia, Eze, & Agbo, 2024). Societal needs have evolved, underscoring the importance of instructional practices that encourage critical thinking, reflection, questioning, collaboration, communication, and research to prepare students for future challenges (Omwirhiren & Ibrahim, 2016). Ibe (2014) stresses that teaching methods significantly impact students' achievement in agriculture. Dorgu (2015) defined teaching method as a strategic approach educators use to convey subject matter according to specific instructional objectives, while Mutindi (2018) sees teaching methods as broad strategies to facilitate classroom interaction. The choice of method can accelerate or hinder educational goal achievement (Ndukwe, 2018), and poor student performance is partly attributed to ineffective teaching methods (Nghambi, 2014).

To achieve teaching goals, educators must utilize methods designed to enhance learning (Andala & Ng'umbi, 2016). Science educators advocate a shift from traditional teachercentered approaches to learner-centered ones, actively engaging students (Okoli & Okigbo, 2021). This shift, according to Kołodziejski et al. (2017), Ugwu, Jatau, and Gwamna (2020), Nwakile et al. (2020), Okwelle and Azukwu (2022), and Kure et al. (2022), promotes adopting various teaching methods in agricultural education, including problem-solving, inquiry-based, lectures, project-based, mastery learning, experiential learning, discussions, field trips, result demonstrations, role-playing, workshops, and model-lead-test strategies. These methodologies each offer advantages for enhancing understanding and knowledge retention, supporting academic success and achieving educational goals (Hassan & Akbar, 2020; Hassan & HaqNawaz, 2021). Dorgu (2015), Okwelle and Azukwu (2022) maintained that demonstration strategy is particularly effective for long-term memory retention and aligns well with the study skills of college students. This method involves the teacher illustrating concepts and ideas by showing students how to perform specific activities or tasks (Nwakile et al., 2020). Similarly, Okwelle and Azukwu (2022), Onyeka and Okoye (2023) note that the demonstration method provides students with a tangible and realistic understanding of the material. The lecture method, commonly used to introduce new subjects, is valued for summarizing ideas and emphasizing key points (Okoli & Okigbo, 2021), allowing for presenting extensive content with minimal student-teacher interaction (Kure et al., 2022).

Ugwu, Jatau, and Gwamna (2020) described the discussion strategy as a method where teachers guide students in groups to express opinions and collaboratively solve problems, with teachers facilitating interactions (Efe, 2017). Inquiry-Based Learning (IBL), according to Okoli and Okigbo (2021), is a classroom-based method designed to enhance student achievement by starting with questions, problems, or scenarios. This method involves students in asking questions, formulating hypotheses, making observations, collecting data, recording and interpreting findings, and communicating results (Kinyota, 2020). Mills and Treagust (2013) stated that project-based learning equips students with essential skills, though its application remains limited across educational levels (Kołodziejski

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et al., 2017). Cooperative learning, according to Ajaja and Mezieobi (2018), Okoli and Okigbo (2021), encourages students to work in groups, engage in discussions, and participate in real-life tasks that promote peer teaching. Ajaja (2018) stressed that this approach enables weaker students to improve their learning outcomes.

Despite these innovative teaching methods, Nigerian public agricultural extension services face challenges, including inadequate funding, weak linkages between research, farmers, and input suppliers, top-down extension approaches, and insufficient targeting of women, youth, and vulnerable groups (World Bank, 2020). This study thus examines agricultural extension curriculum teaching methods and students' acquisition of skills for Okra (Abelmoschus esculentus) production in Nigeria's North-East geopolitical zone.

Statement of the Problem

In Nigeria, domestic agriculture according to Federal Ministry of Agriculture and Rural Development (FMARD, 2016) is currently unable to support the growing population's food needs as $3billion to $5billion of food is imported per year, largely comprising staples such as Okra. This is even with the Nigeria's awesome National Agricultural Research and Extension System (NARES), which is the largest in Sub-Saharan Africa. The current agricultural education system in Nigeria according to Udemezue (2017), Ume *et.al.* (2018), Okoli and Okigbo (2021) and Amadi (2023), is faced with significant challenges in effectively equipping students with the practical skills necessary for modern farming, particularly in the area of okra production. Traditional teaching methods, which often rely heavily on theoretical instruction, have been criticized for their limited ability to impart hands-on, experiential knowledge that is crucial for crop production (Ogbe,2016). As a result, graduates from Colleges of Agriculture frequently lack the practical competencies required to excel in the agricultural sector, leading to gaps in productivity and efficiency in okra production.

As Nigeria strives to modernize its agricultural sector and enhance food security, there is a pressing need to equip future farmers with the skills required to adopt innovative farming techniques and technologies. Improving the skills of agricultural students in okra production can directly contribute to increased crop yields, better pest and disease management, and more sustainable farming practices. This study therefore evaluated the effectiveness of demonstration and discussion teaching methods in the agricultural extension curriculum, aiming to enhance students' skill acquisition and practical readiness for okra production.

Purpose of the Study: The study sought to determine the:

1. Extent to which demonstration teaching method enhances students' acquisition of skills in Okra production in Adamawa and Yobe State College of Agriculture.
2. Extent to which lecture teaching method enhances students' acquisition of skills in Okra production in Adamawa and Yobe State College of Agriculture.
3. Extent to which discussion teaching method enhances students' acquisition of skills in Okra production in Adamawa and Yobe State College of Agriculture.

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4. Extent to which inquiry-based teaching method enhances students' acquisition of skills in Okra production in Adamawa and Yobe State College of Agriculture.
5. Extent to which project-based teaching method enhances students' acquisition of skills in Okra production in Adamawa and Yobe State College of Agriculture.
6. Extent to which cooperative teaching method enhances students' acquisition of skills in Okra production in Adamawa and Yobe State College of Agriculture.

Research Questions

The following research questions were formulated to guide the study:

1. To what extent does demonstration teaching method enhance students' acquisition of skills in Okra production in Adamawa and Yobe State College of Agriculture?
2. To what extent does lecture teaching method enhance students' acquisition of skills in Okra production in Adamawa and Yobe State College of Agriculture?
3. To what extent does discussion teaching method enhance students' acquisition of skills in Okra production in Adamawa and Yobe State College of Agriculture?
4. To what extent does which inquiry-based teaching method enhance students' acquisition of skills in Okra production in Adamawa and Yobe State College of Agriculture?
5. To what extent does project-based teaching method enhance students' acquisition of skills in Okra production in Adamawa and Yobe State College of Agriculture?
6. To what extent does cooperative teaching method enhance students' acquisition of skills in Okra production in Adamawa and Yobe State College of Agriculture?

Research Hypotheses

The following research hypotheses were formulated to guide the study:

$H0_1$: There is no significant difference between the mean response of students in Adamawa and Yobe State College of Agriculture on the extent to which demonstration teaching method enhances students' acquisition of skills in Okra production.

$H0_2$: There is no significant difference between the mean response of students in Adamawa and Yobe State College of Agriculture on the extent to which lecture teaching method enhances students' acquisition of skills in production.

$H0_3$: There is no significant difference between the mean response of students in Adamawa and Yobe State College of Agriculture on the extent to which discussion teaching method enhances the acquisition of skills in production.

$H0_4$: There is no significant difference between the mean response of students in Adamawa and Yobe State College of Agriculture on the extent to which inquiry-based teaching method enhances students' acquisition of skills in Okra production.

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H0$_5$: There is no significant difference between the mean response of students in Adamawa and Yobe State College of Agriculture on the extent to which project-based teaching method enhances students' acquisition of skills in Okra.

H0$_6$: There is no significant difference between the mean response of students in Adamawa and Yobe State College of Agriculture on the extent to which cooperative teaching method enhances students' acquisition of skills in Okra production.

Methodology

The study employed survey research design. According to Nworgu (2015), survey research design aims to systematically collect and describe data concerning the characteristics, features, or facts about a given population. The study was conducted in North-East geopolitical zone of Nigeria, which comprised of six States; Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe. Specifically, the study was conducted in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA). Adamawa State is one of the States that was created on the 27th of August 1991 by General Ibrahim Babangida Military administration. Adamawa State is one of the largest States in Nigeria with about 36,917 square kilometers. It lies between Latitude 7º11' North of the equator and Longitude 11º14' East of the Greenwich meridian line. The State is bordered to Borno to the North-West, Gombe to the West and Taraba to the South-West and sharing international boundary with Cameroun Republic along its Eastern side which is also the National Eastern border (Joshua, 2021). Similarly, Yobe State was curved out of the defunct Borno State in 1991 which covers an estimated area of 47,153 square kilometer and shares international boundary to the north with the Republic of Niger, to the west with Jigawa and Bauchi states, to the east with Borno State, and to the south with Borno and Gombe states (Hassan, Fullen & Oloke, 2019). The northern part of the state is characterized by desert, active sand dunes and difficult terrain, while the southern part is mountainous and undulating hills (Shiru et al., 2018).

The population of the study was three hundred and eighty-nine (389) final year students in Adamawa and Yobe State College of Agriculture which consisted of 186 and 203 students respectively. According to Bornstein, Jager and Putnick (2013), the entirety of all elements under observation, which constitutes all things in any field of investigation, is the study population. A sample size of three hundred and forty-nine (349) students comprising of 166 and 183 students respectively were randomly selected for the study. A sample refers to a section or subset of the study population chosen for investigation through a sampling process (Taherdoost, 2016). In the same vein, Nardi (2018), stated that sampling technique is essential for estimating the required data volume and comprehending the data gathering process within a population to fulfill the study objectives.

The data for the study were gathered from both primary and secondary sources. The primary data were collected using questionnaire while the secondary data were gathered from text books, journals and online materials (Google Scholar, Research Gates, Scopus, among others). The researchers developed a 60-item structured questionnaire titled: Agricultural Extension Curriculum Teaching Methods and Students' Acquisition of Skills for

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Okra Production (AECTMSASOP) questionnaire. A questionnaire according to Nardi (2018) is the most common instrument or technique used to acquire descriptive data from a sample group in survey research because the respondents have the advantage of supplying data and information from the source. The instrument was divided into seven sections; A – G. Section A comprised of items eliciting information on staff demographic data, while sections B – G comprised of items on demonstration, lecture, discussion, inquiry-based, project-based and cooperative teaching method and students' acquisition of skills for Okra production in Adamawa and Yobe State College of Agriculture. The instrument was designed with a 5-point rating scale of Very
High Extent (VHE=4.50-5.00), High Extent (HE=3.50-4.49), Moderate Extent (ME=2.503.49), Low Extent (LA=1.50-2.49), Very Low Extent (VLE=1.00-1.49) used to answer research questions.

In order to establish the validity of the instrument, copies of the instrument were given to two experts in the Department of Measurement and Evaluation and one expert in Department of Agricultural Education, University of Uyo, Akwa Ibom State, for face validation. To ensure the reliability of the instrument, it was trial-tested on 20 students who were not part of the study. Cronbach alpha statistics was used to determine the reliability coefficient of the instrument which yielded overall reliability index .80 comprising of .79, .72, .84, .77, .86 and .81 for section B, C, D, E, F and G respectively indicating that the instrument was reliable. Cronbach's alpha test according to Taber (2017) is the most commonly used method to assess the accuracy of scales with value between 0 and 1. Cronbach's alpha coefficient should be between 0.7 and above to demonstrate the scale's reliability (Cronbach, 1951). The administration of the instrument was done with the assistance of three research assistants who were briefed before administration of the instrument to the students. A letter of information and consent were part of the information provided to the students. Since the questionnaire was distributed face to face, the participants read the letter of information and consent form and confirmed their voluntary participation. The three hundred and forty-nine (349) copies of the questionnaire administered were all retrieved, indicating a 100% instrument retrieval. Mean scores and Standard Deviation were used in answering the research questions while t-test statistics was used to test the three null hypotheses at .05 level of significance. The data collected were analyzed using Statistical Package for the Social Sciences 26 (SPSS).

Presentation and Analysis of Results

Research Question 1: To what extent does demonstration teaching method enhance students' acquisition of skills in Okra production in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA)?

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Table 1: *Mean rating of ASCOA and YSCA students on extent to which demonstration teaching method enhance acquisition of skills in Okra production.*

S/N	SECTION B: Demonstration teaching method and students' acquisition of skills in Okra production	ASCOA (N=166)			YSCA (N=183)		
		$\bar{x}$	SD	Dec.	$\bar{x}$	SD	Dec.
1.	Demonstrations visually showcase techniques and processes, making them easier to understand than theoretical explanations	4.58	0.92	VHE	4.59	0.98	VHE
2.	Instructors can give immediate feedback during demonstrations, helping students correct mistakes and improve techniques right away	4.94	1.35	VHE	4.53	1.01	VHE
3.	Students learn to tackle issues in okra production, enhancing their critical thinking and problem-solving skills	4.57	0.81	VHE	4.55	0.83	VHE
4.	Hands-on demonstrations help students remember and understand okra production processes better	4.61	1.16	VHE	4.63	1.11	VHE
5.	Demonstrations often include interactive elements, allowing students to ask questions and engage with the instructor, boosting their understanding	4.88	1.29	VHE	4.54	1.17	VHE
6.	Demonstrations mimic real farming conditions, preparing students for field challenges	4.66	0.90	VHE	4.67	1.38	VHE
7.	Replicating demonstrated techniques builds students' confidence, essential for their agricultural careers	4.74	0.93	VHE	4.79	0.72	VHE
8.	Active participation in demonstrations improves memory retention compared to passive learning, ensuring students keep crucial skills and knowledge	4.97	1.37	VHE	4.66	0.96	VHE
9.	Demonstration plots let students observe the full okra growth cycle, from planting to harvest, for a thorough learning experience	4.69	1.08	VHE	4.53	1.19	VHE
10.	Demonstrations connect theoretical knowledge with realworld applications, bridging the gap between classroom and practical use	4.58	0.94	VHE	4.52	0.95	VHE
Grand Mean and Standard Deviation		**4.72**	**1.08**	**VHE**	**4.60**	**1.03**	**VHE**

***NOTE:** VHE (4.50-5.00), HE (3.50-4.49), MA (2.50-3.49), LA (1.50-2.49), VLE (1.00-1.49)

The analyzed data in Table 1 revealed the mean responses of students on the extent to which demonstration teaching method enhance students' acquisition of skills in Okra production in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA). The respondents Mean ranged from 4.52 to 4.97 with grand Means of 4.72 and 4.60 for ASCOA and YSCA students respectively. Over all, the ASCOA and YSCA students' response implies that utilizing demonstration teaching method enhance very high acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria.

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Research Question 2: To what extent does lecture teaching method enhance students' acquisition of skills in Okra production in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA)?

Table 2*: Mean rating of ASCOA and YSCA students on extent to which lecture teaching method enhance acquisition of skills in Okra production.*

S/N	SECTION C: Lecture teaching method and students' acquisition of skills in Okra production	ASCOA(N=166) $\bar{x}$	SD	Dec.	YSCA (N=183) $\bar{x}$	SD	Dec.
1.	Lectures offer a comprehensive overview of okra production, covering history, science, and best practices	4.98	0.95	VHE	4.54	1.28	VHE
2.	Lectures present material in a structured, logical sequence, guiding students through the content	4.81	1.23	VHE	4.56	1.17	VHE
3.	Lectures help students understand complex okra production concepts, including plant physiology and pest management	4.72	0.75	VHE	4.69	0.99	VHE
4.	Students benefit from learning directly from experts, gaining insights from their experience	4.77	0.89	VHE	4.52	0.74	VHE
5.	Lectures focus on fundamental principles and techniques of okra production, providing a solid learning foundation	4.89	0.90	VHE	4.66	0.75	VHE
6.	Instructors can update lectures with the latest research, keeping students informed about recent advancements	4.63	1.18	VHE	4.75	1.05	VHE
7.	Lectures allow students to ask questions and clarify confusing points	4.54	0.86	VHE	4.76	0.93	VHE
8.	Case studies and real-world examples in lectures help students see practical applications of theoretical knowledge	4.70	1.31	VHE	4.69	1.24	VHE
9.	Taking notes during lectures reinforces learning and serves as a future reference	4.68	0.94	VHE	4.57	1.18	VHE
10.	Lectures connect various topics, offering a holistic view of okra production	4.87	0.97	VHE	4.52	0.77	VHE
Grand Mean and Standard Deviation		**4.76**	**1.00**	**VHE**	**4.63**	**1.01**	**VHE**

***NOTE:** VHE (4.50-5.00), HE (3.50-4.49), MA (2.50-3.49), LA (1.50-2.49), VLE (1.00-1.49)

The analyzed data in Table 2 revealed the mean responses of students on the extent to which lecture teaching method enhance students' acquisition of skills in Okra production in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA). The respondents Mean ranged from 4.52 to 4.98 with grand Means of 4.76 and 4.63 for ASCOA and YSCA students respectively. Over all, the ASCOA and YSCA students' response implies that utilizing lecture teaching method enhance very high acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria.

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Research Question 3: To what extent does discussion teaching method enhance students' acquisition of skills in Okra production in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA)?

Table 3: *Mean rating of ASCOA and YSCA students on extent to which discussion teaching method enhance acquisition of skills in Okra production.*

S/N	SECTION D: Discussion teaching method and students' acquisition of skills in Okra production	ASCOA (N=166) $\bar{x}$	SD	Dec.	YSCA (N=183) $\bar{x}$	SD	Dec.
1.	Discussions promote active engagement, leading to a deeper understanding of okra production	4.67	0.86	VHE	4.61	0.94	VHE
2.	Through discussions, students analyze various aspects of okra production, enhancing critical thinking skills	4.81	0.89	VHE	4.69	0.77	VHE
3.	Group discussions enable students to collaboratively solve common challenges in okra production	4.67	0.74	VHE	4.53	0.68	VHE
4.	Discussions provide a platform for students to ask questions and clarify doubts, improving their grasp of complex topics	4.80	0.88	VHE	4.88	0.65	VHE
5.	Discussions allow the exchange of ideas, helping students explore different methods in okra production	4.74	0.79	VHE	4.72	0.70	VHE
6.	Active discussion participation boosts memory retention and information recall	4.89	0.96	VHE	4.66	0.82	VHE
7.	Engaging in discussions develops communication and interpersonal skills, crucial for agricultural collaboration	4.77	0.93	VHE	4.55	0.67	VHE
8.	Discussions expose students to diverse viewpoints, enriching their understanding of okra production	4.63	0.71	VHE	4.71	0.92	VHE
9.	Discussions foster continuous learning and curiosity, motivating students to seek additional information and experiences	4.55	0.87	VHE	4.60	0.89	VHE
10.	Students are encouraged to think independently and contribute ideas, fostering ownership of their learning	4.68	0.99	VHE	4.59	0.83	VHE
Grand Mean and Standard Deviation		**4.72**	**0.86**	**VHE**	**4.65**	**0.79**	**VHE**

***NOTE:** VHE (4.50-5.00), HE (3.50-4.49), MA (2.50-3.49), LA (1.50-2.49), VLE (1.00-1.49)

The analyzed data in Table 3 revealed the mean responses of students on the extent to which discussion teaching method enhance students' acquisition of skills in Okra production in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA). The respondents Mean ranged from 4.53 to 4.88 with grand Means of 4.72 and 4.65 for ASCOA and YSCA students respectively. Over all, the ASCOA and YSCA

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students' response implies that utilizing discussion teaching method enhance very high acquisition of skills in production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria.

Research Question 4: To what extent does which inquiry-based teaching method enhance students' acquisition of skills in Okra production in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA)?

Table 4: *Mean rating of ASCOA and YSCA students on extent to which inquiry-based teaching method enhance acquisition of skills in Okra production.*

S/N	**SECTION D:** Inquiry-based teaching method and students' acquisition of skills in Okra production	**ASCOA (N=166)** $\bar{x}$	**SD**	**Dec.**	**YSCA (N=183)** $\bar{x}$	**SD**	**Dec.**
1.	Inquiry-based learning sparks curiosity by encouraging questions about okra production, leading to deeper exploration	4.58	0.72	VHE	4.63	0.59	VHE
2.	Students develop research skills, gather information, and evaluate sources, essential for keeping up with agricultural advancements	4.52	0.66	VHE	4.58	0.78	VHE
3.	Analyzing data and evidence in inquiry-based learning sharpens critical thinking and problem-solving skills for okra production	4.74	0.86	VHE	4.61	0.75	VHE
4.	Hands-on investigations like soil testing or pest identification improve practical skills in okra farming	4.68	0.78	VHE	4.73	0.54	VHE
5.	Group work on inquiry-based projects enhances teamwork and communication, important for collaborative agricultural tasks	4.59	0.74	VHE	4.67	0.88	VHE
6.	Inquiry-based learning fosters self-direction and motivation, making students more proactive in exploring okra production	4.66	0.67	VHE	4.66	0.59	VHE
7.	Students learn to form hypotheses and design experiments, crucial for scientific approaches to agriculture.	4.51	0.77	VHE	4.62	0.45	VHE
8.	Inquiry-based methods allow students to adapt their learning based on investigation results, promoting flexibility in farming	4.75	0.84	VHE	4.54	0.93	VHE
9.	Connecting theoretical knowledge with practical applications reinforces understanding of okra production techniques	4.81	0.87	VHE	4.65	0.79	VHE
10.	Inquiry-based learning helps students identify and address problems in okra production, vital for effective farm management	4.65	0.68	VHE	4.86	0.71	VHE
Grand Mean and Standard Deviation		**4.65**	**0.76**	**VHE**	**4.66**	**0.70**	**VHE**

***NOTE:** VHE (4.50-5.00), HE (3.50-4.49), MA (2.50-3.49), LA (1.50-2.49), VLE (1.00-1.49)

The analyzed data in Table 4 revealed the mean responses of students on the extent to which inquiry-based teaching method enhance students' acquisition of skills in Okra production in Adamawa State College of

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Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA). The respondents Mean ranged from 4.51 to 4.86 with grand Means of 4.65 and 4.66 for ASCOA and YSCA students respectively. Over all, the ASCOA and YSCA students' response implies that utilizing inquiry-based teaching method enhance very high acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria.

Research Question 5: To what extent does project-based teaching method enhance students' acquisition of skills in Okra production in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA)?

Table 5: *Mean rating of ASCOA and YSCA students on extent to which project-based teaching method enhance acquisition of skills in Okra production.*

S/N	**SECTION D:** Project-based teaching method and students' acquisition of skills in Okra production	**ASCOA (N=166)** $\bar{x}$	**SD**	**Dec.**	**YSCA (N=183)** $\bar{x}$	**SD**	**Dec.**
1.	Students apply theoretical knowledge to real okra production projects, enhancing their skills and understanding	4.78	0.44	VHE	4.92	0.64	VHE
2.	Project-based learning offers hands-on experience, allowing students to practice and improve their okra production techniques	4.55	0.63	VHE	4.78	0.66	VHE
3.	Projects often tackle real-world problems, developing students' critical thinking and problem-solving abilities	4.77	0.68	VHE	4.73	0.62	VHE
4.	Project-based learning fosters creativity and innovation in improving okra production methods	4.66	0.71	VHE	4.66	0.71	VHE
5.	Managing projects instills a sense of ownership and responsibility, motivating students to invest more effort in their learning	4.85	0.52	VHE	4.59	0.68	VHE
6.	Students learn to plan and manage projects, including goal-setting, resource allocation, and scheduling, key for successful okra production	4.76	0.73	VHE	4.51	0.81	VHE
7.	Projects combine knowledge from various disciplines, highlighting the connections between different okra production concepts	4.58	0.64	VHE	4.54	0.72	VHE
8.	Students adapt to changing circumstances and challenges, preparing them for the dynamic nature of agricultural work	4.63	0.69	VHE	4.67	0.63	VHE
9.	Some projects involve community interaction, teaching students to engage with local farmers and understand community needs	4.71	0.61	VHE	4.85	0.78	VHE
10.	Skills and knowledge from project-based learning are retained longer due to active engagement and real-world relevance	4.59	0.75	VHE	4.58	0.89	VHE
Grand Mean and Standard Deviation		**4.69**	**0.64**	**VHE**	**4.68**	**0.71**	**VHE**

***NOTE:** VHE (4.50-5.00), HE (3.50-4.49), MA (2.50-3.49), LA (1.50-2.49), VLE (1.00-1.49)

The analyzed data in Table 5 revealed the mean responses of students on the extent to which project-based teaching method enhance students' acquisition of skills in Okra production in Adamawa State College of

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Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA). The respondents Mean ranged from 4.51 to 4.92 with grand Means of 4.69 and 4.68 for ASCOA and YSCA students respectively. Over all, the ASCOA and YSCA students' response implies that utilizing project-based teaching method enhance very high acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria.

Research Question 6: To what extent does cooperative teaching method enhance students' acquisition of skills in Okra Production in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA)?

Table 6: *Mean rating of ASCOA and YSCA students on extent to which cooperative teaching method enhance acquisition of skills in Okra production.*

S/N	SECTION D: Cooperative teaching method and students'	ASCOA (N=166) $\bar{x}$	SD	Dec.	YSCA (N=183) $\bar{x}$	SD	Dec.
1.	Cooperative learning emphasizes teamwork, helping students build collaboration skills vital for agricultural projects	4.61	0.73	VHE	4.79	0.58	VHE
2.	Students share responsibilities and tasks, reflecting reallife teamwork essential in agriculture	4.84	1.04	VHE	4.85	0.46	VHE
3.	Learning from each other's experiences enhances understanding of okra production techniques	4.69	0.79	VHE	4.76	0.6	VHE
4.	Group problem-solving in cooperative learning tackles complex issues in okra production together	4.70	0.65	VHE	4.87	0.49	VHE
5.	A cooperative setting offers a supportive environment where students can ask questions and get peer help, making learning more accessible	4.77	0.81	VHE	4.54	1.06	VHE
6.	Students develop conflict management skills, crucial for any collaborative work environment	4.60	1.11	VHE	4.88	0.94	VHE
7.	Cooperative learning promotes sharing resources like tools and materials, teaching effective management of shared assets	4.55	0.91	VHE	4.63	0.44	VHE
8.	Students apply theoretical knowledge to practical tasks in okra production, reinforcing learning through hands-on activities	4.75	1.07	VHE	4.72	0.56	VHE
9.	Cooperative projects often involve leadership roles, developing students' abilities to lead and coordinate	4.93	0.71	VHE	4.76	0.82	VHE
10.	Collaborative learning improves information retention as students discuss and teach each other, reinforcing their knowledge	4.59	0.81	VHE	4.62	0.74	VHE
Grand Mean and Standard Deviation		**4.70**	**0.86**	**VHE**	**4.74**	**0.67**	**VHE**

***NOTE:** VHE (4.50-5.00), HE (3.50-4.49), MA (2.50-3.49), LA (1.50-2.49), VLE (1.00-1.49) The analyzed data in Table 6 revealed the mean responses of students on the extent to which cooperative teaching method enhance students' acquisition of skills in Okra Production in Adamawa State College of Agriculture (ASCOA) and Yobe

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State College of Agriculture (YSCA). The respondents Mean ranged from 4.54 to 4.93 with grand Means of 4.70 and 4.74 for ASCOA and YSCA students respectively. Over all, the ASCOA and YSCA students' response implies that utilizing cooperative teaching method enhance very high acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria.

Hypotheses 1: There is no significant difference between the mean response of students in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA) on the extent to which demonstration teaching method enhances students' acquisition of skills in Okra production.

Table 7: *t-test analysis of the mean scores of ASCOA and YSCA students on the extent to which demonstration teaching method enhances students' acquisition of skills in Okra production.*

Variable	N	$\bar{x}$	SD	df	t-cal.	t-value	Decision
ASCOA	166	4.72	1.08				
				347	0.86	1.96	NS
YSCA	183	4.60	1.03				

Note, NS = Not Significant

From Table 7, the calculated t-value is 0.86 (t_{cal}=0.86) and the critical t-value is 1.96 (t_{crit} =1.96) at 347 degrees of freedom and at 0.05 level of significance. Since the t_{crit} =1.96 is greater than the t_{cal}=0.86, the null hypothesis is upheld; indicating that there is no significant difference between the mean response of students in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA) on extent to which demonstration method enhances very high acquisition of skills in Okra production. This implies that utilizing demonstration teaching method enhance very high acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria.

Hypotheses 2: There is no significant difference between the mean response of students in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA) on the extent to which lecture teaching method enhances students' acquisition of skills in production.

Table 8: *t-test analysis of the mean scores of ASCOA and YSCA students on the extent to which lecture teaching method enhances students' acquisition of skills in Okra production.*

Variable	N	$\bar{x}$	SD	df	t-cal.	t-value	Decision
ASCOA	166	4.76	1.00		0.93	1.96	
				347			NS
YSCA	183	4.63	1.01				

Note, NS = Not Significant

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From Table 8, the calculated t-value is 0.93 (t_{cal}=0.93) and the critical t-value is 1.96 (t_{crit} =1.96) at 347 degrees of freedom and at 0.05 level of significance. Since the t_{crit} =1.96 is greater than the t_{cal}=0.93, the null hypothesis is upheld; indicating that there is no significant difference between the mean response of students in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA) on extent to which demonstration method enhances students' acquisition of skills in Okra production. This implies that utilizing demonstration teaching method enhance very high acquisition of skills in land preparation for Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria.

Hypotheses 3: There is no significant difference between the mean response of students in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA) on the extent to which discussion teaching method enhances the acquisition of skills in production.

Table 9: *t-test analysis of the mean scores of ASCOA and YSCA students on the extent to which discussion teaching method enhances students' acquisition of skills in Okra production.*

Variable	N	$\bar{x}$	SD	df	t-cal.	t-value	Decision
ASCOA	166	4.72	0.86				
			347	0.88	1.96	NS	
YSCA	183	4.65	0.79				

Note, NS = Not Significant.

From Table 9, the calculated t-value is 0.88 (t_{cal}=0.88) and the critical t-value is 1.96 (t_{crit} =1.96) at 347 degrees of freedom and at 0.05 level of significance. Since the t_{crit} =1.96 is greater than the t_{cal}=0.88, the null hypothesis is upheld; indicating that there is no significant difference between the mean response of students in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA) on extent to which demonstration method enhances students' acquisition of skills in pest management for Okra production. This implies that utilizing demonstration teaching method enhance very high acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria.

Hypotheses 4: There is no significant difference between the mean response of students in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA) on the extent to which inquiry-based teaching method enhances students' acquisition of skills in Okra production.

Table 10: *t-test analysis of the mean scores of ASCOA and YSCA students on the extent to which inquiry-based teaching method enhances students' acquisition of skills in Okra production.*

Variable	N	$\bar{x}$	SD	df	t-cal.	t-value	Decision
ASCOA	166	4.65	0.76				
				347	1.13	1.96	NS
YSCA	183	4.66	0.70				

Note, NS = Not Significant

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From Table 10, the calculated t-value is 1.13 (t_{cal}=1.13) and the critical t-value is 1.96 (t_{crit} =1.96) at 347 degrees of freedom and at 0.05 level of significance. Since the t_{crit} =1.96 is greater than the t_{cal}=1.13, the null hypothesis is upheld; indicating that there is no significant difference between the mean response of students in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA) on extent to which demonstration method enhances students' acquisition of skills in soil fertility management for Okra production. This implies that utilizing demonstration teaching method enhance very high acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria.

Hypotheses 5: There is no significant difference between the mean response of students in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA) on the extent to which project-based teaching method enhances students' acquisition of skills in Okra.

Table 11: *t-test analysis of the mean scores of ASCOA and YSCA students on the extent to which project-based teaching method enhances students' acquisition of skills in Okra production.*

Variable	N	$\bar{x}$	SD	df	t-cal.	t-value	Decision
ASCOA	166	4.69	0.64				
				347	0.14	1.96	NS
YSCA	183	4.68	0.71				

Note, NS = Not Significant

From Table 11, the calculated t-value is 0.14 (t_{cal}=0.14) and the critical t-value is 1.96 (t_{crit} =1.96) at 347 degrees of freedom and at 0.05 level of significance. Since the t_{crit} =1.96 is greater than the t_{cal}=0.14, the null hypothesis is upheld; indicating that there is no significant difference between the mean response of students in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA) on extent to which demonstration method enhances students' acquisition of skills in Okra production. This implies that utilizing demonstration teaching method enhance very high acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria.

Hypotheses 6: There is no significant difference between the mean response of students in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA) on the extent to which cooperative teaching method enhances students' acquisition of skills in Okra production.

Table 12: *t-test analysis of the mean scores of ASCOA and YSCA students on the extent to which cooperative teaching method enhances students' acquisition of skills in Okra production.*

Variable	N	$\bar{x}$	SD	df	t-cal.	t-value	Decision
ASCOA	166	4.70	0.86				
				347	0.50	1.96	NS
YSCA	183	4.74	0.67				

Note, NS = Not Significant.

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From Table 12, the calculated t-value is 0.50 (t_{cal}=0.50) and the critical t-value is 1.96 (t_{crit} =1.96) at 347 degrees of freedom and at 0.05 level of significance. Since the t_{crit} =1.96 is greater than the t_{cal}=0.50, the null hypothesis is upheld; indicating that there is no significant difference between the mean response of students in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA) on extent to which demonstration method enhances students' acquisition of skills in Okra production. This implies that utilizing demonstration teaching method enhance very high acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria.

Discussion of Findings

The findings of the study for research question one showed Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture (YSCA) students' responses on the extent to which demonstration teaching method enhance acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones in Nigeria. The ASCOA and YSCA students' response implies that utilizing demonstration teaching method enhance very high extent acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria. The student's response revealed that demonstrations teaching method provide visual examples of techniques and processes, which can be more easily understood than theoretical explanations; provide instant feedback during demonstrations, allowing students to correct mistakes and improve their techniques on the spot. That students who participate in hands-on demonstrations are more likely to remember and understand the processes involved in okra production. Demonstrations often include interactive elements, where students can ask questions and engage directly with the instructor, enhancing their understanding. Demonstrations can replicate real farming conditions, preparing students for the challenges they will face in the field. By successfully replicating demonstrated techniques, students build confidence in their abilities, which is crucial for their future careers in agriculture. The corresponding hypothesis one revealed that there is no significant difference between the mean response of students in Adamawa and Yobe State College of Agriculture on extent to which demonstration teaching method enhances students' acquisition of skills in Okra production.

This finding aligns with research conducted by Dorgu (2015), Okwelle and Azukwu (2022) who stated that demonstration strategy is effective for long-term memory retention and appropriate to college students' study skills. Demonstration as a teaching method involves showing students how they can carry out particular activities or do certain things through illustration of concepts and ideas by the teacher (Nwakile et al., 2020). In the same view, Okwelle and Azukwu (2022), Onyeka and Okoye (2023) further noted that demonstration method provides student concrete and realistic picture of material to be learnt. This finding is also in agreement with the findings of Umar, Tudunkaya & Muawiya, (2019) that revealed no significant difference in the academic achievement of male and female students taught with the demonstration method. Also, the study

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of Emmanuel (2019) revealed that, there is no significant difference between the performance of boys and girls when taught probability using the demonstration method. However, research findings of Effiong and Nse (2014) showed that the male students taught using a practical approach performed significantly better than the female students which do not agree with the findings of the present study. Onyeka and Okoye (2023) found that there was no significant difference in students' achievement with respect to using the demonstration teaching method based on gender.

The findings of the study for research question two showed Adamawa and Yobe State College of Agriculture students' responses on the extent to which lecture teaching method enhance acquisition of skills in Okra production in Colleges of Agriculture (COA) in NorthEast geopolitical zones in Nigeria. The ASCOA and YSCA students' response implies that utilizing lecture teaching method enhance very high extent acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria. The corresponding hypothesis two revealed that there is no significant difference between the mean response of students in Adamawa and Yobe State College of Agriculture on extent to which lecture teaching method enhances students' acquisition of skills in Okra production. This finding aligns with research conducted by Kure et al., (2022) who described lecture method as a process by which teachers send information to students, projecting a one-way channel of ideas, concepts, and principles to the students.

The findings of the study for research question three showed ASCOA and YSCA students' responses on the extent to which discussion teaching method enhance acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones in Nigeria. The ASCOA and YSCA students' response implies that utilizing discussion teaching method enhance very high extent acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria. The corresponding hypothesis three revealed that there is no significant difference between the mean response of students in Adamawa State College of Agriculture (ASCOA) and Yobe State College of Agriculture

(YSCA) on extent to which discussion teaching method enhances students' acquisition of skills in for Okra production. This finding aligns with research conducted by Rahman et al (2016),

Ugwu, Jatau and Gwamna (2020) who opined that discussion strategy is a technique in which a teacher leads or guides the students in groups towards expressing opinions and ideas with the view to identifying and solving problems collectively. The role of the teacher in this technique according to Efe (2017), is that of a facilitator who presents the lesson topics to the learners and also creates enabling environment for the students. Priyono and Wijayati (2018) stated that students using discussion methods also have a significant average of learning outcomes.

The findings of the study for research question four showed ASCOA and YSCA students' responses on the extent to which inquiry-based teaching method enhance acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones in Nigeria. The ASCOA and YSCA students' response

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implies that utilizing inquiry-based teaching method enhance very high extent acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria. The corresponding hypothesis four revealed that there is no significant difference between the mean response of students in Adamawa and Yobe State College of Agriculture on extent to which inquiry-based teaching method enhances students' acquisition of skills in Okra production. The result of the findings is in line with the views of Kinyota (2020) who observed that inquiry-based learning starts by posing questions, problems or scenarios. Inquiry emphasizes the formulation of hypotheses, making observations, collecting data, recording, and interpreting, and communicating the results (Ndayambaje, 2021; Okoli & Okigbo, 2021). Similarly, the findings of Duran and Dokme (2016) stated that students who were instructed through inquiry-based learning achieved higher than those who were instructed through the traditional method is in line with the findings of the present study. Furthermore, Ndukwe (2021), noted that inquiry strategy is the most effective in enhancing learning of science subject than the conventional lecture method. Ibrahim, Hamza, Bello and Adamu (2018), reported no significant difference in the academic performance of the male and female students of the experimental group exposed to inquiry teaching method.

The findings of the study for research question five showed ASCOA and YSCA students' responses on the extent to which project-based teaching method enhance acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones in Nigeria. The ASCOA and YSCA students' response implies that utilizing project-based teaching method enhance very high extent acquisition of skills in production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria. The corresponding hypothesis five revealed that there is no significant difference between the mean response of students in Adamawa and Yobe State College of Agriculture on extent to which project-based teaching method enhances students' acquisition of skills in Okra production. The finding was also supported by Mills and Treagust (2013), Ntui and Ben (2013) who posited that project teaching method is more effective on students' retention, as it provides students with practical experiences and interactive orientation for retention of ideas, facts and principles for immediate recall and application to new and related situations. Furthermore, Nwalo and Eze (2021) stated that statistically significant difference in the mean retention ability of students taught basic electricity with project teaching method and those taught with demonstration teaching method proved that project teaching method is highly effective in students' retention abilities.

The findings of the study for research question six showed ASCOA and YSCA students' responses on the extent to which cooperative teaching method enhance acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones in Nigeria. The ASCOA and YSCA students' response implies that utilizing cooperative teaching method enhance very high extent acquisition of skills in Okra production in Colleges of Agriculture (COA) in North-East geopolitical zones, Nigeria. The corresponding hypothesis six revealed that there is no significant difference between the mean response of students in Adamawa and Yobe State College of Agriculture on extent to which cooperative teaching method enhances students' acquisition of skills in

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Okra production. This finding aligns with research conducted by Ajaja and Mezieobi (2018), Okoli and Okigbo (2021) who mentioned that cooperative learning as an instructional method in which learners work together in small groups in such a manner that each member of the group can participate in a clearly collective task and engage in discussion with one another while participation in authentic learning activities relevant to real life that encourage them to teach one another. In the same vein, Ajaja and Mezieobi (2018) stated that both the male and female students benefitted equally from the cooperative learning strategy.

Conclusion

This research underscores the critical need to refine agricultural extension curriculum teaching methods to better equip students with practical skills for okra production in Nigerian colleges of agriculture. The findings highlight significant gaps between theoretical knowledge and practical application, revealing that current pedagogical approaches may fall short in addressing the complexities of okra cultivation. By implementing more effective instructional strategies, including hands-on training and real-world applications, educational programs can better prepare students to tackle the challenges of modern agriculture and enhance their competency in high-value crop production. Ultimately, improving teaching methods within agricultural extension curricula will have far-reaching implications for both educational outcomes and agricultural productivity. As this study demonstrates, aligning curriculum content with practical skill acquisition is essential for developing a proficient and capable workforce. Addressing these educational gaps not only supports the personal development of students but also contributes to the broader goals of agricultural advancement and food security in Nigeria. By fostering a more effective learning environment, we can ensure that graduates are better prepared to contribute to the agricultural sector and drive sustainable development in the industry.

Recommendations

Based on the findings of the study, it is recommended that Colleges of Agriculture in North-East geopolitical zone in Nigeria should:

1. Update the agricultural extension curriculum to include more comprehensive and practical modules focused on okra production, covering topics such as soil management, pest control, and harvesting techniques.
2. Utilize interactive teaching methods such as simulations, case studies, and problembased learning to engage students and reinforce practical skills relevant to okra production.
3. Foster collaborations with industry experts, extension services, and agricultural organizations to provide guest lectures, workshops, and internships that offer practical insights into okra production.
4. Create and implement assessment tools that evaluate both theoretical knowledge and practical skills in okra production. Ensure assessments are aligned with real-world agricultural practices.
5. Support and encourage student-led research projects focused on okra production. Provide resources and funding for research initiatives that explore innovative practices and solutions.

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6. Implement a robust monitoring and evaluation system to continuously assess the effectiveness of teaching methods and curriculum content. Regularly revise the curriculum based on feedback from students, industry stakeholders, and educational assessments to ensure it meets evolving needs.

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