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Assessing the Impact of Field-Based Learning on Skills Development of Agricultural Education Students in Niger Delta University, Bayelsa State

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Abstract
This study assessed the impact of field-based learning on the skill development of Agricultural Education students at Niger Delta University, Bayelsa State. Adopting a descriptive survey research design, the study involved a total population of 113 students across 100 to 400 levels in the Department of Agricultural Science Education. Given the manageable population size, no sampling was conducted; instead, the entire population was studied. Data were collected using a structured, self-designed questionnaire divided into two sections: Section A captured demographic information, while Section B comprised 21 items measured on a 4-point Likert scale. The instrument was validated by two experts for content and construct validity and subjected to test-retest reliability to ensure consistency. Data analysis was carried out using mean scores, with 2.5 set as the criterion for agreement. The findings revealed that field-based learning including practical farm work, field trips, and project-based activities significantly enhances students' technical and soft skills, such as hands-on abilities, critical thinking, teamwork, confidence, and application of theory to practice. The study concluded that field-based learning plays a vital role in developing the competencies required for academic and professional success in agriculture. It recommended the integration and strengthening of field-based instructional strategies in the Agricultural Education curriculum to improve student learning outcomes and real-world readiness.

Keywords: Assessment, Impact, Field-Based Learning, Skills Development

Introduction

Field-based learning has become a vital pedagogical tool in contemporary education. It emphasizes direct engagement with real-world environments, allowing students to apply classroom theories in authentic contexts. This learning model provides an opportunity for students to engage with real-life problems, fostering an understanding that bridges theoretical frameworks with practical applications. Johnson et al. (2020) describe field-based learning as an approach that requires students to participate actively in real-world environments, enabling the application of classroom knowledge in authentic contexts. This enhances students' adaptability, problem-solving abilities, and technical skills, crucial for industries like agriculture where field conditions and real-time decision-making are essential.

Evans (2019) suggests that field-based learning is foundational for students' professional readiness, as it nurtures skills that would otherwise remain abstract in traditional classroom settings.

Field-based learning offers a range of significant benefits that enhance student learning outcomes across disciplines. One of the foremost advantages is the deepened understanding and improved retention of knowledge, as students are exposed to real-world environments where theoretical concepts are applied in context. This hands-on approach helps learners relate abstract ideas to practical experiences, making learning more meaningful and enduring (Jørgensen & Stougaard, 2022). In addition to cognitive gains, field-based learning promotes the development of technical and practical skills essential for career readiness. In agricultural and environmental sciences, for example, students acquire firsthand experience with tools, field equipment, and processes, fostering competence and confidence (Ali et al., 2021). It also enhances critical thinking and problem-solving, as students must navigate real-life challenges, make decisions, and adapt their approaches in dynamic settings (Ndlovu & Sibanda, 2023).

Furthermore, fieldwork increases student motivation and engagement by breaking the routine of classroom learning and offering immersive, interactive experiences. This often leads to heightened interest, self-direction, and a stronger connection to the subject matter (Ferguson & Milligan, 2020). Field-based activities also foster teamwork, communication, and leadership skills, especially when carried out in group settings. Finally, engaging with communities through field learning cultivates cultural sensitivity and civic responsibility, helping students develop empathy and a deeper understanding of societal issues. Unlike traditional learning environments, field-based learning promotes active participation, reflection, and adaptation, all of which are fundamental to meaningful skill development and long-term career readiness.

Skills development encompasses the acquisition and refinement of both technical and cognitive abilities, essential for contributing to sustainable agricultural practices and innovation. Rogers (2021) define skills development as the targeted cultivation of competencies that meet the demands of modern agriculture and industry, aligning educational outcomes with labour market needs. For agricultural education students, skills development often includes technical training, analytical skills, and problem-solving abilities that are indispensable in tackling the complex challenges inherent in agricultural production and management. Ali and Thomas (2020) assert that beyond technical skills, development should also address critical thinking, managerial capabilities, and adaptability, preparing students to navigate the shifting landscapes of the agricultural sector. Embedding skills development into educational curricula, agricultural programmes effectively prepare students to address real-world agricultural needs.

Agricultural education is instrumental in providing a structured approach to equipping students with knowledge and practical skills specific to the demands of the agriculture sector. As Roberts et al. (2022) argue, agricultural education is more than imparting theoretical knowledge; it is a comprehensive curriculum and pedagogical practice designed to prepare students for diverse roles in agriculture. This includes technical training, research-focused learning, and sustainability practices, all of which contribute to the holistic development of a student's capacity to address agricultural challenges. Chen (2020) emphasizes that agricultural education fosters a scientific and technological understanding of agricultural systems, encouraging students to apply research and innovation to solve agricultural problems. The curriculum often extends to encompass sustainable agriculture, environmental conservation, and community-focused practices, as noted by White and Green (2019), who argue that such an approach ensures that graduates are prepared not only as skilled professionals but also as stewards of sustainable practices. Through this comprehensive framework, agricultural

education becomes a conduit for field-based learning, allowing students to engage directly with their future careers.

Akpan et al. (2021) indicate that the university's agricultural education programme is designed to address both the general needs of agricultural students and the specific challenges within the region. The university has adopted a curriculum that integrates local agricultural concerns, such as soil management, aquaculture, and sustainable land use, aligning field-based learning experiences with regional demands. Eze (2019) explains the importance of such a curriculum ensures students are equipped with the skills needed to tackle issues such as environmental degradation and food security. Moreover, by providing hands-on training, students gain both a broad understanding of agriculture and a specialized skill set relevant to their immediate environment.

Statement of the Problem

Agricultural education in Nigeria faces a pressing challenge in aligning theoretical knowledge with practical skills, which are essential for students to thrive in the field. Many graduates from agricultural programmes are often inadequately prepared to meet the practical demands of modern agriculture, limiting their employability and effectiveness in addressing the unique agricultural challenges. This gap arises from traditional classroom-based learning models, which focus primarily on theoretical knowledge without adequately integrating practical, field-based experiences. Consequently, graduates may lack essential skills such as hands-on problem-solving, adaptability to field conditions, and technical expertise necessary for the dynamic and often complex agricultural sector.

The effects of this educational gap are significant. Inadequately trained graduates struggle to apply their knowledge effectively, resulting in lower productivity and innovation in the agricultural sector. This shortfall impacts not only the students themselves but also the agricultural industry, which relies on skilled professionals to drive sustainable practices, address food security, and contribute to economic development in the region. As a result, the industry may suffer from a shortage of qualified individuals capable of implementing advancements and improvements, stalling the growth needed to tackle regional agricultural challenges.

Purpose of the Study

The main purpose of this study is to assess the impact of field-based learning on skills development of agricultural education students in Niger Delta University, Bayelsa State. Specifically, it:

1. Assess the impact of practical farm experience on skills development of agricultural education students in Niger Delta University, Bayelsa State.
2. Assess the impact of field trips on skills development of agricultural education students in Niger Delta University, Bayelsa State.
3. Assess the impact of project-based learning on skills development of agricultural education students in Niger Delta University, Bayelsa State.

Research Questions

1.What is the impact of practical farm experience on the skills development of agricultural education students at Niger Delta University, Bayelsa State?

2.What is the impact of field trips in the skills development of agricultural education students at Niger Delta University, Bayelsa State?

3.What is the impact of project-based learning on the skills development of agricultural education students at Niger Delta University, Bayelsa State?

Conceptual Review

Field-Based Learning

Field-based learning is a pedagogical approach that directly involves students in experiential activities outside traditional classroom settings to promote deeper understanding and skills development. According to Nguyen and Patel (2020), field-based learning is an educational strategy where learners engage in real-world environments to apply and reinforce theoretical knowledge, thereby bridging the gap between academic and practical competencies. This form of learning is particularly valuable in fields of agriculture, where hands-on skills and contextual knowledge are essential for professional readiness. In agricultural studies, field-based learning enables students to immerse themselves in the physical and operational aspects of farming, animal husbandry, and agribusiness, thereby developing the practical expertise necessary for the industry (Lee & Carter, 2021).

In addition, field-based learning is defined by Thompson and Edwards (2020) as an interactive learning method focused on direct participation and problem-solving within authentic environments to cultivate skill sets aligned with real-world applications. This definition highlights the importance of field-based learning in fostering adaptability and problem-solving skills, which are essential in the agricultural sector. Through exposure to real-life challenges, such as environmental fluctuations, resource management, and technological integration, students gain a practical understanding of agricultural operations that theoretical learning alone cannot provide. This experiential approach equips students with critical decision-making abilities that can be applied in diverse professional contexts, thus enhancing their employability and effectiveness in the field (Greenfield & Hart, 2019).

Moreover, Adams and Singh (2020) define field-based learning as an instructional model that emphasizes learning through experience, engagement with professional practices, and application of academic concepts in real-world settings. The experience gained through field-based learning fosters not only technical skills but also instills a sense of professionalism and accountability, as students take ownership of projects and activities that mirror actual agricultural work environments. This hands-on engagement strengthens students' abilities to work independently and responsibly, traits that are crucial for success in agricultural professions (Smith, 2021). Ultimately, the integration of field-based learning in agricultural education is indispensable, as it cultivates well-rounded professionals equipped with both theoretical understanding and practical expertise. The definitions and applications of FBL emphasize its role in producing graduates who are prepared to address the challenges of modern agriculture, making it a vital educational strategy for the future of the industry.

Skills Development

Skill development is a process aimed at enhancing individuals' abilities, knowledge, and proficiency, enabling them to perform tasks more effectively and adapt to new challenges within a specific field. In the context of education, skill development refers to structured learning experiences that build technical, cognitive, and interpersonal capabilities essential for career success (Brown, 2019). According to Adams and Singh (2020), skill development encompasses targeted educational activities focused on building practical competencies and critical thinking skills, allowing learners to meet the demands of complex, real-world environments. This approach ensures that students not only acquire theoretical knowledge but also gain the hands-on experience required to apply their learning effectively in professional settings.

In agricultural education, skill development is especially crucial, as it equips students with the capabilities needed to address the dynamic demands of the industry, from technical farming skills to resource management. Greenfield and Hart (2019) define skill development as an educational focus

on fostering applied competencies and industry-relevant expertise that prepare learners for immediate entry into the workforce. This emphasizes the importance of practical training in agricultural studies, as students gain familiarity with tasks such as soil analysis, crop management, and the use of modern farming technologies. Developing these skills in an academic setting ensures that students are workplace-ready and able to contribute effectively to agricultural productivity.

Skill development also fosters personal growth by building confidence, problem-solving abilities, and adaptability in students, which are essential in navigating professional challenges. Martin (2018) describes skill development as "a holistic process of cultivating both technical skills and soft skills, including critical thinking, adaptability, and teamwork, which are vital in today's multidisciplinary and rapidly evolving sectors." This definition highlights the value of soft skills, such as communication and collaboration, which are essential complements to technical expertise in agriculture and other fields. Ultimately, skill development in agricultural education prepares students to innovate, lead, and excel, making it a fundamental aspect of professional training and career readiness.

Impact of Practical Farm Experience on Skills Development

Practical farm experience bridges theory and application by immersing students in real farming scenarios. Collins (2020) defines it as direct participation in agricultural tasks, allowing students to internalize key concepts such as crop care, soil analysis, and livestock management. This experience strengthens their capacity for critical thinking, resilience, and professional judgment (Smith, 2019). Brown & Green (2021) argue that real-world agricultural experiences improve adaptability and strategic thinking. Students tackle unpredictable challenges like pests or weather disruptions, which sharpen their decision-making skills. Furthermore, farm work encourages collaboration, leadership, and communication essential soft skills in professional settings (Turner, 2021). Anderson (2019) adds that the ability to communicate observations and solutions is crucial for innovation and efficiency.

Exposure to modern tools such as automated irrigation, GPS-based machinery, and digital crop monitoring also enhances technological fluency (Jones & Keller, 2020). Practical farm experience encourages sustainability awareness and fosters a responsible mindset toward resource use traits indispensable in future agricultural leaders.

Impact of Field Trips on Skills Development

Field trips are structured educational outings where students engage directly with real-world applications of classroom knowledge. Johnson (2021) and Brown (2018) affirm that such trips allow students to observe and participate in agricultural activities firsthand, making learning more interactive and contextual. By visiting farms, processing facilities, or research centers, students enhance their understanding of agricultural systems. Smith (2019) stresses that field trips stimulate critical thinking and deepen engagement, while Wilson (2020) argues they ignite curiosity and motivation. Roberts (2019) reports that students who take part in field trips show improved cognitive abilities, as the experience promotes observation, analysis, and real-time decision-making. These immersive settings allow learners to connect theoretical frameworks to tangible experiences, which boosts retention and application.

Impact of Project-Based Learning on Skills Development

Project-based learning (PBL) focuses on solving complex, real-world problems through structured student-led projects. Dewey (2019) highlights its effectiveness in promoting active participation, critical inquiry, and hands-on engagement. Students plan and execute projects, requiring them to

research, collaborate, and innovate. Thomas (2021) defines PBL as learning through real-world challenges rather than passive instruction. Jones (2018) and Miller (2019) stress that students take ownership of their learning process through meaningful tasks, often working in teams. This enhances communication, leadership, and analytical thinking. According to Ellis (2020), collaborative project environments mimic real workplaces, fostering professional skills that go beyond academic knowledge. Jenkins (2019) adds that the iterative nature of project work cultivates resilience, adaptability, and informed decision-making. Through sustained effort and reflection, students learn to improve and refine their approaches. Smith (2020) concludes that PBL helps students integrate academic knowledge with practical applications, preparing them to navigate modern agricultural challenges.

Methodology

This study utilizes descriptive survey research design. As noted by Osuala (2016), the descriptive survey method involves collecting data from a sample population to systematically represent and describe the prevailing characteristics or conditions of the subject under investigation. This design is appropriate for the study, as it aims to gather insights and factual information from participants through structured questionnaires. The population of the study consists of 113 students of agricultural education. The population of the study comprises 30 students in 100 level, 38 students in 200 level, 9 students in 300 level and 36 students in 400 level all in Agricultural Science Education Department in Niger Delta University. Given the relatively small size of the population, the researcher deemed it manageable. As a result, the entire population was used for the study, and no sampling was conducted. The instrument for data collection was a self-designed questionnaire divided into two sections: Section A and Section B. Section A gathered personal details of the respondents, while Section B contains 21 items arranged on a 4 points rating scale as follows; Strongly agreed (SA) 4, Agreed (A) 3, Disagreed (D) 2 and Strongly Disagree (SD) 1. The research instrument underwent construct and content validation by two experts. The validators provided feedback on clarity, sentence structure, the appropriateness of the items, and any other observed issues. To ensure the reliability of the instrument for the study, the researcher employed the test-retest technique to assess its consistency. The data was analyzed using the mean. A criterion score of 2.5 was established on a 4-point rating scale. Consequently, any questionnaire item with a mean score of 2.5 or higher was considered agree, while items with a mean score below 2.5 were regarded as disagree.

Results

Research Question 1: What is the impact of practical farm experience in the skills development of agricultural education students at Niger Delta University, Bayelsa State?

S/N **Table 4.1: Mean responses on the impact of practical farm experience in the skills development of agricultural education students at Niger Delta University**

S/N	Items	Mean	Decision
1	Practical farm experience enhances my hands-on skills relevant to agriculture.	3.70	Agree

2	Practical farm experiences improve my confidence in applying agricultural techniques.	3.35	Agree
3	Practical farm experiences have contributed to my problem-solving skills in real agricultural settings.	2.57	Agree
4	Practical farm experiences are essential for developing necessary agricultural skills.	2.50	Agree
5	Practical farm experiences have positively impacted my teamwork skills in agriculture.	3.04	Agree
6	My practical farm experiences have deepened my understanding of sustainable agricultural practices.	3.33	Agree

Table 4.1 indicates the mean responses on the impact of practical farm experience in the skills development of agricultural education students at Niger Delta University. The items had their mean ranging from 2.50 to 3.57 which is above the cut-off of 2.50. This implies that the students agree that farm experiences help enhance their hands-on skills, build their confidence in applying agricultural techniques, and improve their teamwork and understanding of sustainable farming, improve problem-solving skills essential for developing agricultural skills. This suggests that farm-based activities are recognized as useful for gaining practical exposure.

Research Question 2: What is the impact of field trips in the skills development of agricultural education students at Niger Delta University, Bayelsa State?

Table 4.2: Mean responses on the impact of field trips in the skills development of agricultural education students at Niger Delta University

S/N	Items	Mean	Decision
7	Field trips help me understand real-world agricultural applications.	2.53	Agree
8	Field trips provide valuable insights that strengthen my agricultural skills.	3.02	Agree
9	Field trips make learning agriculture more engaging and meaningful.	2.88	Agree
10	I feel better prepared for agricultural careers due to the knowledge gained from field trips.	2.55	Agree
11	Field trips are essential for connecting theoretical knowledge with practical skills in agriculture.	2.70	Agree
12	I have gained new perspectives on agricultural practices through field trips.	3.51	Agree

Table 4.2 shows the mean responses regarding the impact of field trips in the skills development of agricultural education students at Niger Delta University. The results indicate that all items had their mean scores ranging from 2.53 to 3.51, which are all above the benchmark cut-off point of 2.50. This implies that the students agreed that field trips are highly valuable for their skill development in agriculture. The findings suggest that field trips help them understand real-life agricultural practices, make learning more engaging, and strengthen the connection between theory and practice. Therefore, it can be concluded that field trips have a significant positive impact in the skills development of agricultural education students in Niger Delta University.

Research Question 3: What is the impact of project-based learning in the skills development of agricultural education students at Niger Delta University, Bayelsa State?

Table 4.3: Mean responses on the impact of project-based learning in skills development of agricultural education students at Niger Delta University

S/N	Items	Mean	Decision
13	Project-based learning assignments enhance my critical thinking in agricultural studies.	3.52	Agree
14	Project-based learning helps me apply theoretical knowledge in practical ways.	3.35	Agree
15	Project-based learning improves my collaborative skills in agricultural projects.	3.26	Agree
16	Project-based learning has positively contributed to my overall skills development in agriculture.	3.31	Agree
17	Project-based learning encourages me to be more innovative in solving agricultural challenges.	2.59	Agree
18	Project-based learning assignments are relevant to real-life agricultural scenarios.	3.29	Agree

Table 4.3 presents the mean responses on the impact of project-based learning in the skills development of agricultural education students at Niger Delta University. The table shows that all the mean scores fall between 3.26 and 3.52, which are well above the 2.50 decision threshold. This indicates that the respondents agreed that project-based learning contributes meaningfully to their skill acquisition. The data reflects that project-based learning helps them apply theoretical knowledge in practical situations, promotes innovation and collaboration, and develops critical thinking. Based on these results, it is evident that project-based learning is a vital method for enhancing the skills of agricultural science students in the university.

Discussion of Findings

The analysis of Table 4.1 reveals that all the items received mean scores well above the benchmark of 2.50, indicating strong agreement among respondents. This implies that practical farm experiences significantly contribute to skill development among Agricultural Education students at Niger Delta University. Students agreed that working on the farm improved their hands-on skills, boosted their confidence in applying techniques, enhanced problem-solving abilities, encouraged teamwork, and deepened their understanding of sustainable agriculture. These findings are consistent with the work of Akinbobola and Afolabi (2019), who noted that students involved in practical agricultural tasks showed improved application of theoretical knowledge and greater skill acquisition. Similarly, Nwankwo et al. (2021) found that experiential learning, such as farm-based activities, enhances students' ability to solve real-life problems and promotes critical thinking skills, both of which are essential in modern agricultural practices. Therefore, it can be concluded that farm-based learning plays a vital role in shaping both the technical and soft skills of agricultural students, positioning them better for professional success and improving their academic engagement.

Table 4.2, it is evident that students strongly agree on the importance of field trips in developing agricultural skills. The responses show that field trips help students understand real-world agricultural applications, make learning more engaging, and provide new insights that strengthen both practical and theoretical knowledge. All mean scores exceeded the 2.50 benchmark, suggesting that field trips have a positive and significant impact on students' learning outcomes. These findings are supported by Ifeanyieze and Nnajiofor (2019), who emphasized that field-based education allows learners to witness agricultural practices firsthand, thus enhancing their practical knowledge. Additionally, Eze and Odoh (2021) affirmed that students who participated in regular field visits retained information better and demonstrated superior performance in both skill acquisition and theoretical examinations. This demonstrates that field trips are not merely supplementary activities but essential components of agricultural education that connect students to real-life contexts and help solidify their learning.

Table 4.3 also revealed strong agreement from respondents, with all items having mean scores above 2.50. This shows that students find project-based learning to be highly beneficial for skill development in agricultural education. The responses suggest that working on projects helps enhance critical thinking, practical application of theory, innovation, collaboration, and relevance to real-world scenarios. These findings echo the study by Ajayi et al. (2022), which highlighted that project-based learning fosters innovation, decision-making, and independent learning among agricultural students. Similarly, Olagunju and Ogunwale (2020) found that students involved in agricultural projects demonstrated improved technical and problem-solving skills, as well as stronger communication and teamwork abilities.

Conclusion

The findings from the analysis of Tables 4.1, 4.2, and 4.3 collectively underscore the critical importance of experiential learning strategies namely practical farm work, field trips, and project-based learning in the development of essential skills among Agricultural Education students at Niger Delta University. Across all three areas, mean scores significantly exceeded the benchmark of 2.50, indicating strong consensus among respondents on the value of these educational approaches. Practical farm experiences were shown to enhance hands-on skills, build confidence, foster problem-solving, and strengthen teamwork and understanding of sustainable agriculture. Similarly, the analysis of field trips revealed that they are not merely supplementary but are central to agricultural training, as they expose students to real-world practices, enrich classroom learning, and improve information retention

and skill acquisition and project-based learning was also identified as a highly effective pedagogical tool, promoting independent learning, critical thinking, innovation, and teamwork.

The integration of farm practice, field trips, and project-based learning into the Agricultural Education curriculum is essential for equipping students with the practical and intellectual tools necessary for professional success. These approaches foster a holistic learning environment that bridges theory with practice, preparing graduates to contribute meaningfully to agricultural advancement and sustainable development.

Recommendations

Based on the findings of this study, the following recommendations are made to enhance skill development among Agricultural Education students at Niger Delta University:

1. There is a need for improved funding and infrastructural development. The university and relevant stakeholders should ensure that adequate land, farming tools, and modern agricultural technologies are made available to facilitate effective practical training. Without access to real farm settings and resources, students' learning experiences will remain incomplete.
2. Teachers and instructors in agricultural education undergo regular training and capacity-building workshops. These programs will help educators stay updated on modern farming techniques and better facilitate student learning through project-based and experiential approaches.
3. Field trips should be scheduled regularly as a core component of the curriculum. Partnerships with local farms, research institutes, and agribusinesses should be fostered to expose students to diverse agricultural environments and practices.
4. Lecturers should be trained in modern experiential teaching strategies to effectively facilitate farm work, field trips, and project-based learning. This will ensure that students receive guidance that is both practical and pedagogically sound.
5. The university should ensure that learning environments, such as demonstration farms and laboratories, are adequately equipped to support skill acquisition and experiential learning.
6. Students should be encouraged to reflect on their experiential learning through journals, presentations, and peer reviews. This reflective practice will reinforce learning outcomes and help them internalize key lessons.

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