

EFFECT OF HANDS-ON LEARNING ON ACADEMIC PERFORMANCE OF UNDERGRADUATE AGRICULTURAL EDUCATION STUDENTS IN FARM PRACTICE IN NORTH-EAST NIGERIA

¹ Abubakar Ibrahim Muazu, ² Dr. Bishir Umar Saulawa, ³Dr. Sanusi Hassan

1 Department of Vocational Education, Faculty of Education, Abubakar Tafawa Balewa University, Bauchi, Nigeria

2 Department of Vocational Education, Faculty of Education, Abubakar Tafawa Balewa University, Bauchi, Nigeria

3 Department of Construction Technology Educations, Faculty of Education, Abubakar Tafawa Balewa University, Bauchi, Nigeria

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Corresponding author: Abubakar Ibrahim Muazu

Abstract

This study determined the effect of Hands-on Learning on academic performance of undergraduate Agricultural Education students in Farm Practice in North-East Nigeria. The study was motivated by the persistent poor academic performance of students in practical agricultural courses, attributed largely to the continued use of conventional lecture-based instructional methods. A quasi-experimental pre-test, post-test non-equivalent control group design was adopted. The population comprised 131 undergraduate Agricultural Education students offering Farm Practice in Federal Universities in North-East Nigeria during the 2024/2025 academic session. A purposive sample of 76 students from two universities was used. The experimental group comprised 40 students from Modibbo Adama University, Yola, while the control group comprised 36 students from the University of Maiduguri. Data were collected using an adapted Farm Practice Performance Test (FPPT), validated by experts and with a KR-20 reliability coefficient of 0.81. Data were analyzed using mean, standard deviation, and independent samples t-test at the 0.05 level of significance. The findings revealed no significant difference between the pre-test mean performance scores of the two groups. However, students taught using Hands-on Learning performed significantly better in the post-test (Mean = 69.48, SD = 6.73) than those taught using the Conventional Teaching Method (Mean = 49.92, SD = 6.17), $t(74) = 13.74$, $p = .000$. The study concluded that Hands-on Learning

significantly improves students' academic performance in Farm Practice and recommended its adoption alongside the provision of adequate practical facilities by universities.

Keywords: Hands-on Learning, Academic Performance, Farm Practice, Agricultural Education, Undergraduate Students.

1. Introduction

Agricultural education plays a vital role in equipping undergraduate students with the knowledge and practical skills required for agricultural productivity, food security, and national development. The discipline integrates classroom instruction with practical experiences to develop competencies in crop production, livestock management, farm operations, and agricultural entrepreneurship. Farm Practice, as a core component of Agricultural Education, provides students with opportunities to apply theoretical knowledge in real-life farming situations and develop occupational skills required for professional practice (Olaitan et al., 2022).

The effectiveness of Farm Practice depends largely on the instructional strategies employed during teaching and learning. However, the conventional lecture method remains the dominant instructional approach in many Nigerian universities despite its limitations in promoting active participation and practical skill development. As a teacher-centred approach, it often limits students' opportunities to engage directly in learning activities, thereby reducing their ability to acquire practical competencies required in agriculture (Umar, 2021; Adamu&Yaro, 2023).

Hands-on Learning is a learner-centred instructional strategy that actively engages students in practical activities, allowing them to construct knowledge through direct experience. By involving students in farm operations such as land preparation, planting, nursery management, and irrigation, Hands-on Learning promotes meaningful learning, critical thinking, and improved academic performance (Kolb & Kolb, 2020). Previous studies have shown that learner-centred instructional strategies enhance students' academic performance in practical and vocational disciplines more effectively than conventional teaching methods (Ajayi & Afolabi, 2022; Olanrewaju &Ogunniyi, 2022).

1.2 Statement of the Problem

Statement of the Problem

Despite the practical nature of Farm Practice in Agricultural Education, undergraduate students continue to record poor academic performance and demonstrate inadequate practical competencies required for effective agricultural practice. This situation has been attributed largely to the continued reliance on conventional lecture-based instructional methods, which provide limited opportunities for active participation and direct engagement in practical learning activities. Consequently, many students complete Farm Practice without acquiring the practical knowledge and skills expected of Agricultural Education graduates.

Hands-on Learning has been recognized as an effective learner-centred instructional strategy that promotes active participation, experiential learning, and skill acquisition. Although previous studies

have reported its positive effects on students' academic performance in science and vocational education, empirical evidence on its effectiveness in improving the academic performance of undergraduate Agricultural Education students during Farm Practice in North-East Nigeria remains limited. Consequently, it is uncertain whether the adoption of Hands-on Learning would significantly improve students' academic performance in Farm Practice within the study area. This study, therefore, determined the effect of Hands-on Learning on the academic performance of undergraduate Agricultural Education students in Farm Practice in North-East Nigeria.

1.3 Objective of the Study

The main objective of this study was to determine the effect of Hands-on Learning on the academic performance of undergraduate Agricultural Education students in Farm Practice in North-East Nigeria. Specifically the study sought to:

1. Determine the difference between the pre-test mean academic performance scores of undergraduate Agricultural Education students taught Farm Practice using Hands-on Learning and those taught using the Conventional Teaching Method before treatment.
2. Determine the difference between the post-test mean academic performance scores of undergraduate Agricultural Education students taught Farm Practice using Hands-on Learning and those taught using the Conventional Teaching Method after treatment.

1.4 Research Questions

The following research questions guided the study:

1. What is the difference between the pre-test mean academic performance scores of undergraduate Agricultural Education students taught Farm Practice using Hands-on Learning and those taught using the Conventional Teaching Method before treatment?
2. What is the difference between the post-test mean academic performance scores of undergraduate Agricultural Education students taught Farm Practice using Hands-on Learning and those taught using the Conventional Teaching Method after treatment?

Null Hypotheses

The following null hypotheses were tested at the 0.05 level of significance:

H₀₁: There is no significant difference between the pre-test mean academic performance scores of undergraduate Agricultural Education students taught Farm Practice using Hands-on Learning and those taught using the Conventional Teaching Method before treatment.

H₀₂: There is no significant difference between the post-test mean academic performance scores of undergraduate Agricultural Education students taught Farm Practice using Hands-on Learning and those taught using the Conventional Teaching Method after treatment.

METHODOLOGY

The study adopted a quasi-experimental research design. Specifically, a pre-test and post-test non-equivalent control group design was employed. The study was conducted in the North-East geopolitical zone of Nigeria, which comprises Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe States. Specifically, the study was conducted at ModibboAdama University, Yola, Adamawa State,

and the University of Maiduguri, Borno State. The population of the study comprised 131 undergraduate Agricultural Education students offering the Farm Practice course during the 2024/2025 academic session in Federal Universities in North-East Nigeria. Based on the design of the study, two intact classes were used, comprising 40 students from ModibboAdama University, Yola, who constituted the experimental group, and 36 students from the University of Maiduguri, who constituted the control group, giving a total sample of 76 students. The Farm Practice Performance Test (FPPT), developed by the researcher based on the National Universities Commission Benchmark Minimum Academic Standards (BMAS) for Agricultural Education, was used for data collection. The instrument was validated by three experts in Agricultural Education and yielded a reliability coefficient of 0.81 using the Kuder-Richardson Formula 20 (KR-20). Therefore, the instrument was considered adequate for data collection. Data were collected with the assistance of Farm Practice lecturers in the selected universities. The data obtained from the study were analyzed using mean, standard deviation, and independent samples t-test at the 0.05 level of significance.

RESULTS

Research Question One

What is the difference between the pre-test mean performance scores of students taught Farm Practice using Hands-on Learning and those taught using the Conventional Teaching Method before treatment?

Table 1: Pre-test Mean Performance Scores of Students Taught Using Hands-on Learning and Conventional Teaching Method

Groups	(N)	Mean ($\bar{x}$)	(SD)
Hands-on Learning	40	27.58	4.29
Conventional Method	36	27.08	4.36

Table 1 shows that before the treatment, students in the Hands-on Learning group had a mean score of 27.58 (SD = 4.29), while those in the Conventional Teaching Method group had a mean score of 27.08 (SD = 4.36). The close means scores indicate that both groups possessed similar academic ability before the instructional intervention.

Research Question Two

What is the difference between the post-test mean performance scores of students taught Farm Practice using Hands-on Learning and those taught using the Conventional Teaching Method?

Table 2: Post-test Mean Performance Scores of Students Taught Using Hands-on Learning and Conventional Teaching Method

Groups	(N)	Mean ($\bar{x}$)	(SD)	Mean Gain
Hands-on Learning	40	69.48	6.73	41.9
Conventional Method	36	49.92	6.17	22.84

Table 2 shows that students taught using the Hands-on Learning approach obtained a higher post-test mean score (69.48, SD = 6.73) than those taught using the Conventional Teaching Method (49.92, SD = 6.17). The Hands-on Learning group also recorded a higher mean gain score (41.90) compared to the Conventional Teaching Method group (22.84). This indicates that Hands-on Learning was more effective in improving students' academic performance in Farm Practice.

Null Hypothesis One

H₀₁: There is no significant difference between the pre-test mean performance scores of students taught Farm Practice using Hands-on Learning and those taught using the Conventional Teaching Method.

Table 3: Independent Samples t-Test of Pre-test Mean Performance Scores of Students Taught Using Hands-on Learning and Conventional Teaching Method

Variable	N	Mean ($\bar{x}$)	SD	t	df	p-value	Decision
Hands-on Learning	40	27.58	4.29				
				0.5	74	0.619	Accepted
Conventional Teaching Method	36	27.08	4.36				

Table 3 shows that there was no statistically significant difference between the pre-test mean performance scores of students taught using Hands-on Learning and those taught using the Conventional Teaching Method, $t(74) = 0.50$, $p = 0.619$. Therefore, the null hypothesis was accepted, indicating that the two groups were academically equivalent before the instructional intervention.

Null Hypothesis Two

H₀₂: There is no significant difference between the post-test mean performance scores of students taught Farm Practice using Hands-on Learning and those taught using the Conventional Teaching Method.

Table 4: Independent Samples t-Test of Post-test Mean Performance Scores of Students Taught Using Hands-on Learning and Conventional Teaching Method

Variable	N	Mean ($\bar{x}$)	SD	t	df	p-value	Decision
Hands-on Learning	40	69.48	6.7				
				13.7	74	0	Rejected
Conventional Teaching Method	36	49.92	6.2				

Table 4 shows that students taught Farm Practice using Hands-on Learning achieved a significantly higher post-test mean score than those taught using the Conventional Teaching Method ($t = 13.74$, $df = 74$, $p = 0.000$). Therefore, the null hypothesis was rejected. This indicates that Hands-on Learning had a significant positive effect on the academic performance of undergraduate Agricultural Education students in Farm Practice.

DISCUSSION

The findings of this study revealed that there was no significant difference between the pre-test mean performance scores of students in the Hands-on Learning and Conventional Teaching Method groups before the treatment. This indicates that the two groups were academically comparable prior to the instructional intervention. The finding suggests that any difference observed after the treatment was attributable to the instructional strategy rather than differences in students' entry behaviour. This finding is consistent with the reports of Danladi and Bello (2023) and Okwudishu and Amadi (2020), who also found no significant differences in the pre-test performance of experimental and control groups before instructional intervention.

The study further revealed that students taught Farm Practice using the Hands-on Learning approach achieved significantly higher post-test mean performance scores than those taught using the Conventional Teaching Method. This finding demonstrates that active participation in practical learning activities enhances students' understanding and application of agricultural concepts more effectively than the traditional lecture method. The result supports the principles of Experiential Learning Theory, which emphasizes learning through direct experience (Kolb, 1984; Kolb & Kolb, 2020). The finding also agrees with Muhammed and Haruna (2021), Chukwu and Aliyu (2021), Olabiyi and Ojo (2022), Danjuma and Ibrahim (2023), and Olanrewaju and Ogunniyi (2022), who reported that students exposed to hands-on instructional strategies performed significantly better than those taught using conventional methods. The superior performance recorded by the Hands-on Learning group in the present study confirms that practical engagement enhances students' academic performance in Farm Practice.

CONCLUSION

Based on the findings of this study, it was concluded that Hands-on Learning is a more effective instructional approach than the Conventional Teaching Method in improving the academic performance of undergraduate Agricultural Education students in Farm Practice. Although both groups exhibited similar academic ability before the treatment, students exposed to Hands-on Learning demonstrated significantly better academic performance after the instructional

intervention. The study therefore provides empirical evidence supporting the adoption of learner-centred instructional strategies in Agricultural Education programmes.

RECOMMENDATIONS

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

1. Agricultural Education lecturers should adopt Hands-on Learning as the preferred instructional approach for teaching Farm Practice in universities.
2. University administrators should provide adequate farm tools, equipment, instructional materials, and practical facilities required for effective implementation of Hands-on Learning activities.
3. Curriculum planners should strengthen the practical component of Farm Practice by incorporating learner-centred instructional approaches into Agricultural Education programmes.
4. Universities should organize workshops, seminars, and professional development programmes to equip Agricultural Education lecturers with the knowledge and skills required for effective implementation of Hands-on Learning.

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