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EFFECTS OF FIELDTRIP TEACHING STRATEGY ON STUDENTS' ACADEMIC PERFORMANCE AND RETENTION IN AGRICULTURAL SCIENCE IN SECONDARY SCHOOLS, JIGAWA STATE

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ABSTRACT

This study examined the effects of field trip teaching methods on students' academic performance and retention in agricultural science in secondary schools of Kazaure Zonal Education, Jigawa State, Nigeria. Four research questions and corresponding hypotheses guided the study, which employed a quasi-experimental design with 757 Senior Secondary School II Agricultural Science students from seven Public co-educational schools

INTRODUCTION

Agriculture Science is the cultivation of crops and rearing of animals for human consumption, agriculture provide employment to the nation, agricultural science is the production of crops and raising livestock. Agriculture is the method of production of food, fiber, feed, milk and many other desirable products by the cultivation of crops and the rearing of farm animals (Usanga, 2019). The main aim of agriculture is to produce food and employment opportunities for the populace. Agriculture helps to meet the basic needs of human by providing food, clothing, shelters, medicine and recreation (Larsen, Walsh, Almond & Myers, 2016).

A Field-trip, which may also be termed as an instructional trip, school excursion, or school journey, is defined by Instructional strategies online (2013) to be a school or class trip with an educational intent, in which students interact with the setting,

in Jigawa state. Two schools were randomly selected and assigned as experimental and control groups. Ninety-five (95) students of 2 intact classes purposely selected as sample for the study. The study used the Agricultural Science Achievement Test (ASAT) as the data collection instrument, with Cronbach Alpha and a reliability index of 0.83. The data was analyzed using mean and standard deviations, and the hypotheses were tested using t-test. The results showed a significant difference in performance and retention ability between students taught crop propagation using field trip method and those taught using conventional lecture method. The field trip method was found to be more effective in retaining concepts than the lecture method. The researcher recommended that Agricultural Science teachers should use field trip methods to teach agricultural science in secondary schools in Kazaure Zonal Education, Jigawa State.

Keywords: Field Trip, Academic Performance, Retention, Teaching Strategies, Agricultural Science

displays, and exhibits to gain an experiential connection to the ideas, concepts, and subject matter. Cirfat in Oka and Samuel (2020) defines a field trip as an excursion or journey beyond the classroom with the goal of having first hand observations and obtaining specific information.

According to Cirfat in Oka and Samuel (2020), fieldtrip is a study trip taken outside the classroom to obtain direct experience from the natural setting and to improve student's interest in learning for collecting data, materials or objects as well as to observe objects or phenomena not possible to bring within the classroom. During fieldtrips, the entire class visits a point of instructional interest such as museum, factory, Hill Mountain, inselbergs valleys, river side etc. Fieldtrip is an outdoor or fieldwork or learning exercise undertaken by the teacher and the students in certain aspect of subject, particularly in agriculture so as to give the students an opportunity to acquire knowledge. It is a trip arranged by the school and undertaken for educational purpose in which the students go to places where the concepts for instruction may be observed and studied directly in their functional setting. Academic performance refers to a student's success in their educational pursuits, often measured through grades, test scores, or overall measurable achievement. Several recent studies have emphasized that academic performance is multifaceted and influenced by factors such as motivation, instructional quality, and learning environments. For example, Anderson and Lee (2023) found that "academic

performance improves when students are provided with supportive, interactive learning environments" (Anderson & Lee, 2023).

Retention refers to a student's ability to retain information over a period, enabling long-term knowledge application and understanding. Recent studies have emphasized that retention is influenced by active engagement, learning environment, and the instructional methods used. For instance, Ndlovu and Sithole (2020) found that "retention is significantly improved when students actively participate in hands-on and collaborative activities," emphasizing the need for experiential learning in education (Ndlovu & Sithole, 2020).

It was observed that most teachers still rely on the conventional lecture method while abandoning and neglecting the use of other method like field trip in their teaching and learning (Audu, 2022). Students offering agriculture therefore graduate from secondary schools with theoretically based knowledge without being exposed to physical environment to observe the agricultural environment. This may affect academic performance and retention of students in internal and external examinations. Some of the reasons for conducting this research is that teachers neglected and abandoned fieldtrip method as if the method does not exist in the secondary school teaching and learning. Secondly, in spite of the consensual efforts of science educators to alleviate the ugly situation of low achievement of students in Agriculture Nwezi and Nwosu in Umoru (2018) maintain that the problem of poor performance and lack of retention is connected to ineffective teaching strategy employed by teachers.

Therefore, this study determined the Effect of Fieldtrip Method on academic performance and retention in agricultural Science in Senior Secondary Schools in Kazaure Zonal Education, Jigawa State, Nigeria.

Experiential and constructivist learning theories strongly support field-based instruction. Piaget's cognitive-development theory emphasizes that secondary students (approximately ages 11–16) are in the *concrete operational* stage and learn best through hands-on, sensory experiences. In this view, encountering concrete examples (e.g. observing plant propagation in a garden) enables students to assimilate new information into existing cognitive schemas. Likewise, Bruner (1960) argued that education is most effective when abstract concepts are connected to familiar, real-world contexts. Dewey's (1938) classic educational theory of "learning by doing" further posits that active engagement in authentic activities leads to deeper comprehension and stronger memory. For instance, Dewey contends that participatory experiences "deepen comprehension" of subject matter. Field trips, by immersing students in genuine farm environments, instantiate these ideas: they challenge preconceptions, encourage learners to accommodate new information, and provide multisensory stimuli (sights, smells, touch)

that reinforce learning. As Yunusa (2024) explain, handling seeds or observing grafting during a field trip gives students concrete referents for abstract propagation concepts, which "ensures better recall compared to theoretical lessons alone".

Objectives of the study

The study was guided by the following objectives, to:

1. Examine the effect of field trip teaching method on Agricultural Science students' academic performance in crop propagation in senior secondary schools in Jigawa state.
2. Determine the effect of field-trip teaching method on Agricultural science students' retention ability in crop propagation in senior secondary school in Jigawa state.
3. Examine the effect of field trip on male and female Students' academic performance in sexual and asexual crop propagation in senior secondary school in Jigawa state.
4. To determine the retention ability of male and female students taught sexual and asexual crop propagation using Field-trip method in senior secondary school in Jigawa State.

Hypotheses

The following null hypotheses were formulated and tested at $p \leq 0.05$ level.

Ho_1: There is no significant difference between the mean achievement scores of Agricultural science students taught crop propagation using field-trip method and those taught using conventional lecture method in senior secondary school in Jigawa State.

Ho_2: There is no significant difference between the retention ability of Agricultural Science students taught crop propagation using field-trip method and those taught using conventional lecture method in senior secondary school in Jigawa State.

Ho_3: There is no significant difference between the mean achievement scores of male and female students taught sexual and asexual crop propagation using field-trip method in senior secondary school in Jigawa State.

Ho_4: There is no significant difference between the retention ability of male and female students taught sexual and asexual crop propagation using field-trip method in senior secondary school in Jigawa State.

Methodology

This study employed a quasi-experimental, pretest–posttest design. The population consisted of 757 Senior Secondary School II Agricultural Science students from seven Public co-educational schools in Jigawa state. Two schools were randomly selected and placed as experimental and control groups. Ninety-five (95) students of 2 intact classes purposely selected as sample for the study. Two intact classes were randomly selected and assigned to two groups: one experimental group (field-trip instruction) and one control group (traditional lecture). The field-trip group was exposed to a series of guided agricultural excursions where students directly observed and participated in crop propagation activities. The control group covered the same curriculum topics through classroom lectures and textbook study. Both groups took a standardized crop-propagation achievement test immediately after instruction and a retention test two weeks later. The study used the Agricultural Science Achievement Test (ASAT) as the data collection instrument, with Cronbach Alpha and a reliability index of 0.83. The data were analyzed using independent-samples *t*-tests to compare the mean scores of the field-trip and control groups on both the post-test and delayed retention test.

Results

The results are presented in line with the formulated hypotheses. The hypotheses were tested at the $p \leq 0.05$ level of significance.

H_{O1}: There is no significant difference between the mean achievement scores of Agricultural Science students taught crop propagation using Field-trip method and those taught using conventional lecture method.

To test this hypothesis, the post-test scores of students in the experimental group (Field trip) and control group (lecture method) were analyzed using t-test.

Table 1: Independent Sample t-test Analysis of post-test Mean Scores for Experimental and Control Groups

Groups	N	Mean	SD	Df	t-value	p-value	Decision
Experimental	45	16.18	2.995	92	4.21	.000	Rejected
Control	49	13.43	3.028				

The result of the t-test in table 1 shows that the mean score of 16.18 and the standard deviation of 2.995 for experimental group and a mean score of 13.43 and standard deviation of 3.028 for students in the control group. The computed level of significance

for the test was 0.000 and this is lower than the significant level set at $p \leq 0.05$. The hypothesis is therefore rejected which means that there is statistically significant difference in the mean achievement score between the experimental and control groups.

H_{02}: There is no significant difference between the retention ability of Agricultural Science students taught crop propagation using Field-trip method and those taught using conventional lecture method.

To test this hypothesis, the post-test scores of male and female students in the experimental group (field trip method) were analyzed using t-test.

Table 2: Independent sample t-test post-posttest of students in the Experimental and Control group

Groups	N	Mean	SD	Df	t-value	p-value	Decision
Experimental	45	18.64	2.327	92	3.847	.000	Rejected
Control	49	16.69	2.567				

The result in table 2 revealed that the mean score of 18.64 and the standard deviation of 2.327 for experimental group and a mean score of 16.69 and standard deviation of 2567 for students in the control group. The computed level of significance for the test was 0.000 and this is lower than the significant level set at $p \leq 0.05$ which means that there is statistically significant difference in the retention ability of experimental and control group. The hypothesis which states that there is no significant difference between the retention ability of students taught crop propagation using field trip and those taught using conventional lecture method is therefore rejected. This means that field trip significantly enhanced students' retention ability in crop propagation better than conventional lecture method.

H_{03}: There is no significant difference between the mean achievement scores of male and female students taught sexual propagation using Field-trip method.

The post posttest scores of male and female students in the experimental group (Field trip) were analyzed using t-test to determine the mean achievement scores of male and female students taught sexual propagation using Field-trip method.

Table 3: Independent sample t-test analysis of post-test mean scores of male and female students in the Experimental Group

Gender	N	Mean	SD	Df	t-value	p-value	Decision
Male	26	16.92	2.799	43	2.023	.053	Retained
Female	19	16.72	3.023				

The independent t-test result in table 3 revealed that the mean score of 16.92 and the standard deviation of 2.799 for male students and a mean score of 16.72 and standard deviation of 3.023 for female students of the same group. The computed level of significance for the test is 0.053 and this is higher than the significant level set at P ≤ 0.05 which means there is no significant difference in the academic achievement between male and female students in the experimental group. The hypothesis which states that there is no significant difference between the mean achievement scores of male and female students taught sexual propagation using field trip is therefore retained. This means that field trip method (gender friendly) significantly enhanced both male and female students' achievement in sexual propagation in senior secondary school in Jigawa State.

H_{04}: There is no significant difference between the retention ability of male and female students taught sexual propagation using Field-trip method.

The retention test scores of students in the experimental group (field trip method) were analyzed using t-test to determine the retention ability of students in sexual propagation.

Table 4: Independent sample t-test Analysis of post post-test mean scores of Students in the Experimental and control Group

Gender	N	Mean	SD	Df	t-value	p-value	Decision
Male	29	19.14	2.219	43	-0.02	.209	Retained
Female	19	19.16	2.433				

The result in table 4 revealed that the mean score of 19.14 and the standard deviation of 2.219 for male students in the experimental group and a mean score of 19.16 and standard deviation of 2.433 for female students in the same group. The computed level of significance for the test was 0.209 and this is higher than the significant level set at P ≤ 0.05 which means that there is no statistically significant difference in the retention ability of male and female students in the experimental group. The hypothesis which states that there is no significant difference between the retention ability of male and female students taught sexual propagation using field trip method is therefore retained. This means that field trip method significantly enhanced both male and female students' retention ability.

Discussion of Findings

This study investigated the Effect of Fieldtrip teaching method on Students' Academic Performance and Retention in Agricultural Science among Secondary Schools in Jigawa State. Eight null hypotheses were tested and the findings were discussed as follows.

The study has found out that there is significant difference between the mean achievement scores of experimental and control groups (p is 0.000 < 0.05). This finding is in agreement with the findings of Sussan and Ebele (2021) which showed among others thus that the use of field trip (FT) is more effective in enhancing students' achievement than conventional lecture method. Another study by Amosa, Ogunlade and Atobatele (2020) revealed that teachers should take students on field trip so as to promote and encourage active engagement in learning, self-motivation, discovery learning and learning by experience. Another study by Audu and Iyam (2020) is in agreement with the current study where they stated that field trip method enhances both students' achievement and retention rate. The study found a significant difference in the mean achievement scores and retention ability of students taught using field trips compared to those taught with conventional methods (p-value = 0.000). This suggests that experiential learning through field trips enhances both immediate understanding and long-term retention of Agricultural Science concepts. The result aligns with Dewey's (1938) theory of experiential learning, which posits that real-world experiences deepen comprehension. Additionally, Orion and Hofstein (1994) emphasized that field trips bridge the gap between theoretical knowledge and practical application, making them a valuable pedagogical tool.

The study also has found out that there is no significant difference between the mean achievement scores of male and female students taught crop propagation using field trip method (p is 0.053 > 0.05). This finding is in agreement with the findings of Martha Ijok Adibe and Tubonemi (2021) who also found out that field trip method is suitable for both male and female students in teaching and learning in secondary schools, hence field trip method is gender friendly in terms of achievement.

Furthermore, the study also shows that there is no significance difference between retention ability of male and female students taught sexual propagation using field trip. This finding is in agreement with the findings of Godwin and Adejoh, (2021) where they stated that there is no significant difference between male and female students' retention rate, hence field trip method is gender friendly in terms of retention. This study is also in line with the findings of Oka and Samuel (2020) where they revealed that students taught using fieldtrip method significantly performed better than those taught using conventional lecture method. This study is also in agreement with the findings of Ogar and Ekpo (2023) where they recommended that fieldtrip had significant effect on students' performance.

The study found no significant difference in achievement (p-value = 0.053) or retention (p-value = 0.209) between male and female students when taught using field trips. This indicates that field-based learning is equally effective for all students, regardless of

gender. These findings resonate with Scantlebury and Baker (2007) research, which found that interactive teaching methods reduce gender-based disparities in science education. The consistent superiority of field trip method over conventional methods highlights the need for curriculum reform in Agricultural Science education. Policymakers and educators should prioritize integrating these interactive strategies to improve learning outcomes. The National Research Council (2012) advocates for such approaches, noting their importance in developing critical thinking and practical skills in STEM fields.

The findings collectively demonstrate that experiential teaching method of fieldtrip significantly enhance student achievement and retention in Agricultural Science, without gender bias. These results call for a shift away from traditional lecture-based instruction toward more dynamic, hands-on learning approaches.

Conclusion

The findings of this study provide compelling evidence supporting the integration of experiential learning method in Agricultural Science education. The significant improvements in both achievement scores and retention abilities among students exposed to field trips compared to those taught through conventional lecture methods, highlight the transformative potential of these pedagogical approaches. These results line up with established educational theories, such as Dewey's (1938) emphasis on learning through experience and Kolb's (1984) experiential learning model, which highlight the importance of active engagement in the learning process. By situating abstract concepts within real-world contexts, field trips not only enhance comprehension but also foster long-term retention, equipping students with practical skills essential for future agricultural practices.

Furthermore, the absence of significant gender disparities in achievement and retention when using these innovative method (fieldtrip) is a noteworthy finding. This suggests that field trips learning create an inclusive educational environment where both male and female students can thrive equally. Such outcomes resonate with contemporary research advocating for gender-inclusive pedagogies in STEM education (Scantlebury & Baker, 2007). By minimizing traditional barriers to participation, these methods promote equity and engagement across diverse student populations.

Finally, this research highlights the superiority of experiential learning methods over conventional approaches in enhancing student outcomes in Agricultural Science. By bridging theory and practice, these methods not only improve academic performance but also prepare students for real-world challenges in agriculture and related fields.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Teachers should design pre- and post-field trip activities that reinforce key concepts, including reflection sessions and practical applications of knowledge gained during the field experience.
2. Educators should use field trips as an equalizing pedagogical tool, particularly encouraging equal participation from all genders in all field-based learning activities.
3. Curriculum developers should create gender-neutral field trip materials and assessment tools that ensure equitable learning opportunities for all students.
4. Schools should allocate budget and resources for fieldtrip learning and train teachers in developing effective fieldtrip lessons.

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