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EFFECT OF MOBILE LEARNING APPLICATION ON STUDENTS' ACADEMIC ACHIEVEMENTS AND INTERESTS IN POULTRY PRODUCTION IN SECONDARY SCHOOLS IN EDO STATE.

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Abstract
This study determined the effect of mobile learning applications on Students' Academic Achievement and interest in poultry production in Secondary Schools in Edo State. Four (3) research questions were raised and answered and 2 null hypotheses tested at a .05 level of significance. The Study adopted a Quasi-experimental pre-test and post-test research design. The population for the study was 2840. The sample of the study was 284 (10%) of the entire population drawn using purposive techniques. The instrument for data collection was 56 achievement test items developed from the literature reviewed in Poultry Production. The items were face and content validated by three experts while the reliability of the items was determined with Richardson K21 which yielded a coefficient of 0.88. Data were collected by the researchers and three research assistants. Data collected were analyzed using descriptive statistics (mean and Standard, deviation) to answer research questions while Analysis of Covariance (ANCOVA) was used to test the hypothesis at p<.05 level of significance. The study revealed that mobile learning applications have positive effects on students' academic achievement as students who were taught breeding and hatching management, brooding, and rearing using mobile learning applications performed better than those taught with demonstration methods. It was therefore recommended among others that government should assist students with mobile devices for the digital learning process in Edo State, and school management should also assist students in installing mobile learning applications on their mobile devices.

Keywords: Mobile Learning Application, Academic Achievement, Poultry Production, Interest

Introduction

Mobile learning, also known as M-learning, is a new pedagogy and education system that utilizes mobile technologies for learning at any time and in any place. According to Jideofor (2024), mobile learning allows for flexible learning and combines information and communication technologies (ICT) to provide education anytime and anywhere. Traxler as cited in Jideofor (2024), mentioned that mobile learning enables learners to access educational resources, share with others, and create content both inside and outside the classroom. The administration of educational systems is handled, and communications between institutions and families are enhanced through mobile learning. Traxler also identified ten areas in which mobile learning proves its value as a learning delivery platform, including expanding the reach of education, promoting personalized learning, supporting learners with disabilities, providing instant feedback and assessment, enabling anytime, anywhere learning, bridging formal and informal learning, ensuring creative use of classroom time, supporting situated learning, facilitating seamless learning, and minimizing educational disruption in

disaster areas Alrasheed, *et al.* (2021). Additionally, mobile learning has become a rapidly growing learning platform, benefiting learners, educators, and the learning process. The development of mobile applications has been accelerated by advances in wireless communications, the expansion of mobile device functionality, and the introduction of open-source mobile platforms (Sokolova, 2014).

Mobile applications offer a convenient and engaging platform for learning, aligning with the interests of many students who are drawn to technology and interactive educational tools.

Interest, according to Vareba (2017), is the attraction that compels a child to respond to a particular stimulus. This means that a child develops interest if a particular stimulus is attractive, arousing, or stimulating. Harachiwicz and Knogler (2017) examined interest from a theoretical perspective and suggested that being intrinsically motivated can be considered as being in a state of interest. This implies that interest is inherent, and any action that brings it to the forefront is an object of interest. Furthermore, anything that can evoke interest is considered motivation. Harachiwicz and Knogler stated that interest captures the desire to engage in activities in a moment and refers to a temporary experience of interest when being engaged with a task. Vareba (2017) in Jideofor (2024) strongly opined that interest is a state of mental and emotional readiness on the part of an individual to respond to an educational situation in a manner that prioritizes the interest of society and profession. In other words, interest is an external state that influences an individual's personal actions. Wordu (2021) stated that unless the teacher stimulates students to be interested in learning, achievements will be minimal. It has been stated that the learner's feelings toward the subject matter will largely determine how much of the material will be learned and how thoroughly it will be learned. Academic achievement in the opinion of Agbulu, *et al.* (2020), is the measures of accomplishment in a specific field of study, as well as standardized test scores, grades, and overall academic ability and performance outcomes. Agbulu, *et al.* (2020) stated that it is a measure of the extent to which students reach the stated objectives in Agriculture through effective means of instruction.

Academic achievement refers to the knowledge and skills acquired by students in various school subjects, typically measured through test scores or grades awarded by teachers (Akuda & Izu, 2016). It encompasses the learning outcomes attained by students, including the knowledge, skills, and concepts gained and retained throughout their course of study, both within formal classroom settings and through informal learning experiences (Salawu, *et al*., 2023). Academic achievement, cited by Andrea (2015), in Orikoha, (2024), represents the totality of a student's demonstrated learning, encompassing knowledge, skills, abilities, and performance across cognitive, affective, and psychomotor domains. Students' academic achievement is assessed through both mastery and performance orientations. The mastery goal emphasizes the development and enhancement of one’s skills and knowledge, while the performance goal focuses on outperforming peers in similar contexts. Academic achievement refers to the extent to which a student, teacher, or institution has achieved short- or long-term educational goals. It is commonly measured by grades, standardized test scores, completion of educational levels, or other formal assessments of learning outcomes (Gajda, *et al*., 2020). Students' academic achievement can drive improvements in poultry production, promoting industry growth and sustainable food systems.

Poultry production, as delineated by Bassey, *et al.* (2020) encompasses the domestic breeding of various avian species such as ducks, geese, quail, guinea fowl, turkeys, chickens, and others. Bassey et al underscore the economic significance of poultry, noting their role as abundant

sources of protein for human consumption, contributors to income generation, providers of raw materials for industrial applications, and creators of employment opportunities. Adedeji, *et al.* (2024) also underscore the importance of poultry production as a means of livelihood for rural communities, delivering financial resources for urgent needs and supplying high-quality protein to the expanding human populace. The successes of breeding programmes aimed at enhancing the genetic qualities of poultry flocks over generations.

Breeding according to Buzala and Janicki (2016) in poultry production encompasses the controlled process of selecting and mating birds, typically chickens, turkeys, ducks, or other poultry, to yield offspring with favorable traits. These traits may encompass amplified egg production, accelerated growth rates, disease resistance, enhanced feed efficiency, or superior meat quality. The process of breeding in poultry production directly influences the genetic composition of the flock, impacting the traits exhibited by the hatched chicks and shaping the future productivity of poultry operations.

Hatching in poultry production entails the incubation of fertilized eggs until they develop into chicks. This process can occur naturally, with hen providing warmth by sitting on the eggs, or artificially using incubators that regulate temperature, humidity, and ventilation. Breeding in poultry production involves the meticulous selection of birds for mating to enhance specific desirable traits. These traits may encompass egg production, growth rate, disease resistance, feed efficiency, and meat quality. The primary objective is to augment the genetic composition of the flock over time, leading to enhanced productivity and increased profits for poultry producers. The hatching of chicks marks the beginning of their growth journey, where proper feeding and nutrition play a decisive role in ensuring their health, development, and overall well-being. Brooding provides the necessary care and attention to support the chicks after hatching.

Brooding denotes the phase immediately after hatch, entailing special care and attention to ensure the health and survival of chicks. Rearing encompasses the period from the conclusion of brooding until sexual maturity. Monalisa, *et al.* (2023) reported that brooding pertains to the care and management of newly hatched chicks during their initial 4 to 6 weeks of life, while rearing encompasses the comprehensive care and management of poultry birds from hatching until maturity. Notably, brooding focuses on the early stages after hatching, while rearing encompasses the entire life cycle of poultry. In recent years, the integration of technology into education has transformed how subjects are taught and learned. However, in many secondary schools in Edo State, the teaching of poultry production, a key aspect of agricultural science, remains largely dependent on traditional methods that may not fully engage students or cater to their learning needs. Despite the increasing availability of mobile learning applications designed to enhance the learning experience, their potential remains underutilized in agricultural education, particularly in poultry production. This situation raises concerns about whether students are achieving optimal academic performance in critical areas such as breeding and hatching management, feeding and nutrition, and brooding and rearing. Additionally, it is unclear whether students find mobile learning applications interesting enough to enhance their engagement and motivation in poultry production studies. The lack of research in this area creates a gap in understanding how mobile learning can influence both academic achievement and student interest, making it necessary to explore its effectiveness in secondary schools in Edo State. This study seeks to address these concerns by examining the impact of mobile learning applications on students' academic achievements and interests in poultry production.

Purpose of the Study

The main purpose of this study was to determine the effects of mobile learning applications on students' academic achievement and interest in poultry production. Specifically, the study seeks to determine the effect of:

i. mobile learning applications on students' academic achievement in breeding and hatching management;
ii. mobile learning applications on students' academic achievement in brooding and rearing; and
iii. students' interest in using mobile learning applications for poultry production in secondary schools.

Research Questions

The following research question guided the study

1. What is the effect of mobile learning applications on students' academic achievement in breeding and hatching management?
2. What is the effect of mobile learning applications on students' academic achievement in brooding and rearing?
3. What is the level of students' interest in using mobile learning applications for poultry production in secondary schools?

Hypotheses

The following hypotheses were tested at a 0.05 level of significance:

Ho1: There is no significant difference between the mean scores of students taught poultry production with mobile learning applications and those taught with demonstration method

Ho2: There is no significant difference in the interest of male and female students in poultry production when exposed to mobile learning applications in secondary schools in Edo State.

Methodology

The study adopted a Quasi-experimental research design of a pre-test, post-test, and non-equivalent control group. Quasi-experimental design according to Agbulu, *et al.* (2020) is often used in classroom experiments when experimental and control groups are naturally assembled as intact classes. The population of the study comprised 2620 senior secondary school students from 28 public senior secondary schools in Edo State who offered agriculture for the 2022/2023 academics session. The sample size of this study was 284 senior secondary school students made up of 128 males and 156 females drawn from senior secondary schools offering Agriculture in the study area. The multi-stage sampling techniques were used to obtain the sample since it is a technique that occurs when different sampling techniques are applied at several stages of the research study. A purposive sampling technique was used to select four schools from 30 senior secondary schools to get equivalent schools and have a sizeable number for the study. Two schools were randomly selected from four schools for experimental, while random sampling was used to select two streams where there are more than two streams in the SS1 class. In a school where there are exactly two streams but where there are more than two streams, simple random sampling technique was used to select only two streams out of all the classes by balloting method.

The instrument used was a 56-poultry production achievement test (PPAT). The academic achievement of SS1 students in poultry production is measured using the academic Achievement test (AAT) developed by the researchers for the study. Three experts validated the poultry production achievement test, two from the department of Agricultural Education, Ignatius Ajuru University, one from Ambrose Alli University Ekpoma, Edo State. The validators' report was requested to examine and advise the researcher on the scope of coverage, content, relevance, and ability, and their inputs were used to produce the final copy of the instrument (PPAT) and was trial tested on thirty (30) students in SS1 in a senior secondary school outside the four sampled schools for the main study. Kuder-Richardson KR-21 =k/k-1 (1-pg/S2) was

used to determine the reliability coefficient of the internal consistency of the test items, which yielded a coefficient of 0.82. The instruments for data collection were pre-test and post-test instruments. The generated data was analyzed using mean and standard deviation for research questions, while the hypotheses was tested using Analysis of covariance (ANCOVA) at 0.05 level of significance arising from the use of intact classes as subjects of the study.

Results

Research Question 1

What is the effect of mobile learning applications on students' academic achievement in breeding and hatching management?

Table 1

Mean and Standard Deviation of Student Scores used in Breeding and Hatching Management (N = 284)

Group	N	Pre-test		Post – test		Mean diff.	Mean Gain
		$\bar{x}$	SD	$\bar{x}$	SD		
Experimental	142	9.77	2.221	40.3	5.339	30.53	14.51
Control	142	8.53	2.340	24.55	6.646	16.02	

Source: Field Work (2023)

Table 1 shows the pre-test and post-test mean scores of students' achievement in Breeding and Hatching Management for both experimental and control groups. The result shows that the students in the experimental group had a pre-test mean score of 9.77 with a standard deviation of 2.221 and a post-test mean score of 40.03 with a standard deviation of 5.339. The difference between the pre-test and post-test mean for the experimental was 30.53 while the control group had a pre-test mean score of 8.53 with a standard deviation of 2.340 and a post-test mean score of 24.55 with a standard deviation of 6.646. The difference between the pre-test and post-test mean for the control group was 16.02 with a mean gain of 14.51 for the experimental and control group. This shows that the mean score for the experimental group was higher than the control group, indicating that the students taught with the mobile learning application performed better than those taught with the conventional demonstration method.

Research Question 2

What is the effect of mobile learning applications on students' academic achievement in brooding and rearing?

Table 2

Mean and Standard Deviation of Student Scores used in Brooding and Rearing with Mobile Learning Application and those Taught using Demonstration Method (N=284)

Group	N	Pre-test		Post – test		Mean diff.	Mean Gain
		$\bar{x}$	SD	$\bar{x}$	SD		
Experimental	142	10.26	2.480	38.68	4.701	28.42	16.88
Control	142	7.80	3.188	19.34	1.712	11.54	

Source: Field Work (2023)

Table 2 shows the pre-test and post-test mean scores of students' achievement in brooding and rearing for both experimental and control groups. The result shows that the students in the experimental group had a pre-test mean score of 10.26 with a standard deviation of 2.480 and a post-test mean score of 38.68 with a standard deviation of 4.701. The difference between the pre-test and post-test mean for the experimental was 28.42 while the control group had a pre-test mean score of 7.80 with a standard deviation

of 3.188 and a post-test mean score of 19.34 with standard deviation of 1.712. The difference between the pre-test and post-test mean for the control group was 11.54 with a mean gain of 16.88 for the experimental and control group. This shows that the mean score for the experimental group was higher than the control group, indicating that the students taught with the mobile learning applications performed better than those taught with the conventional demonstration method,

Research Question 3

What is students' interest in using mobile learning applications for poultry production in secondary schools?

Table 3

Mean and Standard Deviation of Students on their Interest in Mobile Learning Application in Poultry Production in Secondary School (N=284)

S/N	Items	Male Students (N=128)			Female Students (N=156)		
		$\bar{x}$	SD	RMK	$\bar{x}$	SD	RMK
1.	Mobile learning application is interesting to use	3.94	.944	Agreed	3.49	.786	Agreed
2.	The app. makes learning about poultry production fun	3.80	.786	Agreed	3.81	.824	Agreed
3.	The app content is presented in an interesting way	3.69	.815	Agreed	3.96	.706	Agreed
4.	I am motivated to study poultry production using the app	3.67	.757	Agreed	3.45	.953	Agreed
5.	The app makes it easier to understand more complex concepts	3.42	.929	Agreed	3.67	.944	Agreed
6.	The apps videos and animations are engaging	3.58	.874	Agreed	3.50	.871	Agreed
7.	I feel that the app enhances my overall learning experience	3.42	.686	Agreed	3.64	.857	Agreed
8.	The app interactive modules are very engaging	3.53	.874	Agreed	3.35	.706	Agreed
9.	I find the app's user interface easy to navigate	3.87	.756	Agreed	3.45	.753	Agreed
10.	I prefer using the app over the traditional learning method (demonstration)	3.76	.764	Agreed	3.78	.875	Agreed
	TOTAL	**36.68**	**8.185**		**36.1**	**8.275**	

Source: Field Work (2023)

Data in Table 3 revealed that the male students had a grand mean of 36.68 and the standard deviation range of 8.185 while the female students had a grand mean of 36.1 and a standard deviation of 8.275. This indicates that the students agreed that they were interested in poultry production when they were exposed to mobile learning applications in secondary schools in Edo State.

Test of Hypotheses

H_{O1}: There is no significant difference between the mean scores of students taught poultry production with mobile learning application and those taught with demonstration method.

Table 4
ANCOVA Result of Students Showing the Difference between Students Taught Poultry Production with Mobile Learning Application and Those Taught With Demonstration Method

Source	Type 111 Sum of Squares	Df	Mean Square	F-cal	Sig.	Decision
Corrected model	4.189[a]	2	2.099	1.984	.142	
Intercept	1103.241	1	1104.251	1043.707	.000	
Pre-test CP	3.084	1	4.093	3.869	.052	
Treatment CP	.003	1	.004	.003	.948	S
Error	117.387	112	1.058			
Total	38573.000	115				
Corrected Total	121.685	114				

Source: Field Work (2023)

Table 4 shows that the calculated value of F- cal is .003 P>0.05, the value was less than 0.05 level of significance established by the researcher. This indicated that the f-ratio is higher than the significance level of 0.05. It therefore implies that the hypothesis was rejected against the alternate hypotheses, thus, there was a significant difference between the achievements mean scores of students taught mobile learning applications and those taught with demonstration methods in secondary schools in Edo State. In other words, students taught with mobile learning applications performed better than those taught with demonstration methods.

Ho_2: There is no significant difference in the interest of male and female students in poultry production when exposed to mobile learning applications in secondary schools in Edo State.

Table 5
Independent Sample t-test Between Male and Female Students on their Interest in Poultry Production when Exposed to Mobile Learning Application

Respondents	No	$\bar{X}$	SD	DF	T	Sig	P	Decision
Male Students	128	3.683	.24211					
				37	.231	.817	.05	Accepted
Female Students	156	3.670	.18002					

Source: Field Work (2023)

The independent sample t-test comparing male and female students' interest in poultry production using mobile learning applications showed no significant difference. With a sample of 284 students, the mean interest scores for male (3.683) and female (3.670) students were similar. The t-value was 0.231, and the p-value was 0.817, which is greater than 0.05, leading to the acceptance of the null hypothesis (Ho_2). This indicates that gender does not significantly influence students' interest in poultry production under the given conditions.

Discussion of Findings

Findings of research question one revealed that the students taught using mobile learning applications had significantly higher academic achievement in Breeding and Hatching Management than those taught with conventional methods. The experimental group showed a greater mean gain, indicating that mobile learning enhanced learning outcomes by providing interactive and flexible learning experiences. The findings of the study are in harmony with Sung, *et al.* (2016) whose study revealed that mobile learning has turn out to be a learning instrument that come with

great benefit in both classroom and outdoor learning.

The findings of research question two showed that students taught brooding and rearing using mobile learning applications performed significantly better than those taught with traditional demonstration methods. The experimental group had a much higher mean gain, indicating improved learning outcomes. This supports existing research that mobile learning enhances engagement, understanding, and retention, particularly in practical subjects. The findings highlight the effectiveness of mobile applications in bridging learning gaps and improving students' academic achievement in agricultural education. The study's findings align with Ugwuoke, *et al.* (2023), who reported that multimedia applications significantly improved students' academic achievement in agricultural science compared to conventional methods, likely due to the engaging combination of visuals, audio, and video that enhance learning and retention.

The findings of research question three showed that both male and female students displayed high interest in poultry production when taught with mobile learning applications, with minimal gender differences. This suggests that mobile learning tools effectively engage students, boost motivation, and create an inclusive learning environment, supporting earlier research that such technologies enhance interest and participation in agricultural education. The findings of this study align with those of Ugwuoke, *et al.* (2023), which revealed no significant interaction between gender and teaching media, with only a slight mean difference in the academic achievement of male and female students exposed to various teaching methods. However, no statistically significant interaction effects were observed ($p > .05$) between gender and teaching media on student achievement. Similarly, Zudonu and Njoku (2018) reported no interaction between gender and teaching methods regarding students' attitudes toward chemistry. Additionally, a study by Gbenga and Effiong (2015) found no significant interaction effects of teaching methods, gender, and study habits on students' academic performance in Basic Science. This suggests that the combination of teaching methods, gender, and study habits did not significantly impact students' academic performance in Basic Science.

Conclusion

This study investigated the effect of mobile learning applications on students' academic achievements and interests in poultry production in secondary schools in Edo State, focusing on breeding and hatching management, and brooding and rearing. The results revealed that mobile learning applications significantly enhanced students' academic performance in all areas, as these technologies provided engaging, interactive, and accessible learning experiences. Additionally, students showed a strong interest in using mobile learning applications, highlighting the potential of these tools to make learning more flexible, practical, and motivating. Overall, mobile learning was found to be an effective method for improving both academic outcomes and student engagement in poultry production education.

Recommendations

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

1. The government and non-Governmental organizations (NGOs) should assist students with mobile learning devices and ensure an adequate supply of electricity at least during the school period for effective use of the mobile devices in poultry production.
2. The school management should ensure that all students have access to the necessary mobile devices and internet connectivity to use the learning applications.

3. The government should assist students in installing mobile learning applications on their mobile devices which will help to enhance the digital learning process in Edo State.
4. The school management should implement a feedback mechanism for students to share their experiences and suggestions for improving the mobile learning applications.

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