

COMPARATIVE ANALYSIS OF STUDENTS' ACADEMIC PERFORMANCE IN AGRICULTURAL SCIENCE IN PUBLIC AND PRIVATE SECONDARY SCHOOLS IN KADUNA STATE, NIGERIA

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Abstract: This research study entitled comparative analyses of students' academic performance in agricultural science in public and private secondary schools in Kaduna State, Nigeria. The research had two objectives, two research questions, and two null-hypotheses, which were tested at 0.05 level of significance. The ex-post factor design were employed in the study, paper and pencil were used to collect SSCE results in 2014, 2015 and 2016 academic years for all the objectives. The study covered twelve (12) educational zones in Kaduna state with population of 81,921 students that sat for Agricultural Science SSCE in 2014, 2015 and 2016, A purposive sampling techniques and stratified sampling techniques were used to select four public and private secondary schools that offers Agricultural science in the state, the t-test statistical tools was used in analyzing students' academic performance. The results obtained showed that, female students of private secondary schools performed higher than female students of public secondary schools, and then male students of public secondary schools were higher academically. It was recommended in the study that, teachers of public and private secondary schools should adopt the use of "improvise" that is use of local materials as teaching aid, and government should provide all necessary material for teaching/learning improvement.

Keywords: Agricultural science, Students' academic performance, Public and Private Secondary Schools.

1. INTRODUCTION

Agricultural Science subject is part of the vocational subject taught in primary schools and secondary school which inculcated the process of farming in all its branches and among other things includes the cultivation and tillage of the soil, dairying, the production, cultivation, growing, and harvesting of any Agricultural commodities, the raising of livestock or poultry, and any practices performed by a farmer on a farm as an incident to or in conjunction with some farming operations, and it may include the manufacturing or processing of coconut, tobacco, pineapples or other farm products (Bolens, 1997).

The general objectives of Agricultural science subjects are to: stimulate and sustain students' interest in farming; demonstrate that farming in a dignified and paying occupation; enable students to acquire basic agricultural knowledge, practical skills and attitudes; enable students to integrate agricultural knowledge and skills in solving agricultural problems of their families and societies; and prepare students for employment in farming and/or further study in agriculture (Brieseid, and Caillods, 2004).

Agricultural science subject has been taught as a core subject at secondary schools level since its introduction in 1972 up to 2004 when the government phased it out. The reason for phasing it out was to avoid placing students prematurely into

vocational programmes which might not meet their future career preferences as well as the teaching process of the subject which was thought to unable students to master both vocational and cognitive skills at the end of the teaching and learning cycles, thus rendering them incapable of undertaking self or direct employment in the formal and informal sectors (Young, 2011). The government's decision to phase out the subject met with a lot of resistance from educational stakeholders who deemed it inappropriate decision,

Agricultural science subject is the course of study which involves teaching about crop production, livestock management, soil and water conservation and various other aspects of agriculture such as nutrition which improves the quality of life for all people by helping farmers increase production, conserve resources and provide nutritious foods (Fundikira., 2003). In this study, Agricultural science subject refers to a course of study in secondary schools levels which is among optional subjects in the pre-vocational subjects' group which mainly deals with crop and livestock production as well as basics of agricultural mechanisation, economics and soil science.

Private Secondary schools are known as independent schools (non-governmental) or non state schools that are not administered by local, state or national government, they retain right to select their students and are funded in whole or in part by charging their students tuition fees, rather than rely on mandatory taxation through government funding, but they must operate based on government stated curriculum and scheme of work from ministry of education (Heins and David, 2004). Public secondary schools are those operated, funded and overseen by government. (Thattai and Deeptha, 2001). Most of the private schools are funded, conducted and maintained by a private group rather than by government, usually charging tuition and then followed stated curriculum and syllabus as the same with the public schools operated by government (Withan and Joen, 1997).

The overall objective in every teaching –learning interaction as usually required are to bring about harmonious development of the individual and acquisition of the desired knowledge, values and skills to enable him/her function in a particular way. The process of teaching needs to be supervised for effective teaching- learning process. The syllabus and curriculum system must be given special care and consideration so to achieve the desired objectives. Thus, when curriculum system is ensured in every school, there will be positive developments that will bring permanent change in the behavior of the learner signifying that learning has taken place. (Ogweno, 2015).

The teaching and learning of Agricultural science as a subject in secondary schools in the world reveals an evolution from vocational basis in the first half of the 20th century (Laugo, 2009). Interest in teaching and learning Agricultural science in secondary schools seem to be growing because many governments are seeking assistance to implement the subject (Laugo, 2009). The World Bank has been investing heavily in the implementation of Agricultural science subject in secondary schools but there have been limited studies on its effectiveness on economic development (World Bank, 2005). Because the Agricultural science subject weds academic or general subjects with some degree of vocational learning, students can develop not only vocational skills in the field of agriculture, but also cognitive skills to prepare them for university study in agriculture (Yamada, 2001).

2. AGRICULTURAL SCIENCE SUBJECT IN SECONDARY SCHOOLS

According to Morris and Sheffield (1976), teaching of Agricultural science in secondary schools should aim at ensuring that the learner is exposed to and taught the basic principles that are important of agricultural production in the country and exposing and involving learners in various practical and projects that will help them develop the necessary skills and abilities required in agricultural production. By the end of the Agricultural science course, the student should be able to develop an interest and awareness of opportunities that exist in the agriculture sector, create an understanding of agriculture and its importance at the household and national level, and demonstrate that farming is a profitable and dignified occupation and develop and improve the knowledge and ill basic agricultural practices. Other objectives are to provide a background for further studies in agriculture, develop self-reliance, resourcefulness, problem solving abilities and an occupational outlook on agriculture, promote good agricultural activities to enhance environmental conservation and good health, and take an active part in rural development by integrating agricultural activities in the curriculum. Morris and Sheffield (1976) further noted that despite periodic efforts of introducing Agricultural science into the schools in developing countries, penal and community demand for academic education leading to high status and pay of the modern sector has kept most schools within an academic teaching. Thus, as a means of escaping from agriculture and manual labour, schools remain oriented for the fortunate minority who gain access to the modern rather than to the vast majority who remain in traditional agriculture

3. TEACHING AND LEARNING STRATEGIES IN AGRICULTURAL SCIENCE

Agricultural science subject is special in comparison with other subjects in that it cannot be learned solely in the field or solely in the classroom. Practical teaching and learning such as traditional apprenticeship learning should ideally be complemented by more formal learning to enable many aspects of agriculture and rural development to be seen in their true perspective (Mwangi and Mwai, 2002). Teaching and learning strategies are traditionally referred to as methods of teaching and learning. Modern trends in teaching and learning emphasize certain approaches which determine the strategy to be used. These approaches include; interactive approach, collaborative approach, transmission approach, experiential approach and facilitative approach. Interactive approach is where there is exchange of ideas between the teacher and the learner or among learners themselves as in group work. Collaborative approach is where learners share ideas in groups or projects. Transmission approach, the teacher dominates the lesson by use of lecture. In experiential approach learners life experiences are explored and used as a basis for development of new knowledge, skills and passing judgment. Learning is based on the learner's experiences in the community. In facilitative approach the teacher provides the stimulus for learner's interaction with the new knowledge and also provides opportunities for the learners to learn. The teacher is merely a guide and director of learning/teaching (Petty, 2004). Based on the above approaches the Agricultural science teacher is the one who determines the strategy to use depending on the content he/she is teaching the learners. The most used strategies in teaching Agricultural science are lectures, demonstrations, discussion, educational visits, projects, question and answers, assignment and practical (Williams and Dollisso, 1998). Lecture as a method of teaching involve transmission of information from teacher to the learner. The teacher reads out the notes to the learners as he/she explains to them. The method is mainly teacher centered and the learner's activity is listening and taking notes. Demonstration is a practical way of explaining or describing a process or activity. The teacher demonstrates an activity before engaging the class in the same. The teacher may also use one of the learners to demonstrate the activity. Discussion is a form of interaction which involves learners' participation through talking or writing in which merits and demerits of a process or object are considered, it encourages an open exchange of ideas. Educational visits provide learners with an opportunity to explore other environments and make school life more interesting as it provides the learners with exciting experiences that bring joy and satisfaction that would not have been in the experience in the normal classroom interaction. A number of teachers are however, of the opinion that field trips are not well-planned and scheduled (Faulker and Baggett, 2005; McKinney, 2005). According to Oluwole (1987), the practical orientation and education value of projects make students suitable for implementing the practical aspects of Agricultural science in secondary schools. Assignments are a common practice in most schools. This involves literature review and at times interview or field observations. During a study of literatures are assisted to learn how to extract facts and figures from books and reports and to prepare a brief written report on their findings. Assignments have become an excellent teaching aid that increases the students' communication skills. Although secondary school Agricultural science teaching and learning had been in existence for many years, teaching and learning methods are still far from satisfactory because they are largely focused on transferring knowledge which is judged to be useful in examinations. Most of information is merely memorised and learners do precisely what they are told by their teachers or trainers (Faulker and Baggett, 2005; McKinney, 2005).

4. CONCEPT OF ACADEMIC PERFORMANCE

Winston, *et al* (2014), defined performance as the act of performing, carries into execution or action, execution, achievement, accomplishment, representation by action, as the performance of an undertaking of a duty. Joanna, *et al* (1980), defined performance as how well or how badly one does something. Academic performance is the ability to study and remember facts and being able to communicate the knowledge, verbally or down on paper (Adato, and Meinzen-Dick, 2007). The term academic performance refers to how well a student does in school. Poor grades are considered as bad academic performance. It also refers to how students deal with their studies and how they coped with or accomplish different tasks given to them by their teachers. Academic performance generally means how students are accomplishing their tasks and studies, but there are quite a number of factors that determine the levels and quality of students' academic performance.

In educational institutions, success is measured by academic performance, or how well a student meets standards set out by institution. As career competition grows ever fiercer in the working world, the importance of students' doing well in school has caught the attention of parents and government education departments alike. Although, education is the only road to success in the working world, much effort is made to identify, evaluate and encourage the progress of students in schools. Parents care about their child's academic performance because they believe that good academic results will provide more career choices and job security.

Academic performance in school is evaluated in a number of ways. For regular grading, students demonstrate their knowledge by taking written and oral tests, performing presentations, turning in homework and participating in class activities and discussions. Therefore, teachers evaluate in the form of letter or number grades and side notes to describe how well a student has done. School though invested in fostering good academic habits for the same reason, are also often influenced by concerns about the school's reputation and the possibility of monetary aid from government institutions which can hinge on the overall performance of the school.

The researcher viewed academic performance as a basic process of adopting and improving the quality and progress of students' performance, what is learned can be measured either by those things that have been observed in the behaviour of the individual or those that can be inferred. There is continuity in learning and it builds on experienced in whom it takes place, i.e. the school and academic performance is the focus of discussion in this study (Oni, 2015).

Academic performance refers to how students strived with their studies and how they coped with or accomplish different tasks given to them by their teachers (Keith, 2005) Eyo (2012). The strength of a nation largely depend on the quantity and quality of her human resources and quality of human resources and education is pivot on which development rotate. In Nigeria, academic attainment have been regarded very seriously as the parameters for recruitment, placement and advancement in both public and private organizations, more importantly these parameters are also highly adopted in selection of candidates for admission in the tertiary institutions and colleges. Due to this high premium placed on academic performance individuals do every thing possible to obtain excellent results. This no doubt places these concerned particularly students at varying levels of anxiety and tension in the process (Fianu, 1981).

5. RESEARCH OBJECTIVES

- 1 To compare the academic performance of male students of public and private secondary schools in Agricultural Science in Kaduna, and
- 2 To compare the academic performance of female students of public and private secondary schools in Agricultural science in Kaduna State,

6. RESEARCH QUESTIONS

1. What is the academic performance of male student of public and private secondary schools in Agricultural Science?
2. What is the academic performance of female students of public and private secondary schools in Agricultural Science?

7. RESEARCH HYPOTHESES

1. There is no significant difference in the academic performance of male students of public and private secondary schools.
2. There is no significant difference in the academic performance of female students of public and private secondary schools.

8. RESEARCH DESIGN

The Ex post Facto research design was employed in the study. The research design is useful whenever two groups differed on independent variables, and the hypotheses about differences on one or more dependent variables of the groups need to be tested. In this study the Ex post facto design is deemed fit because the study attempts to test hypotheses on the academic performance of two groups which differs on characteristics such as: ownership of schools, and gender. Ex post factor research uses data already collected, but not necessary amassed for research purposes. (Cohen, Manion, and Manison, 2009).

Sampling technique and Sample Size

For the purpose of this research study, sampling technique involving stratified and systematic sampling techniques were used, the researchers sampled Two educational zones out of the twelve educational zones available in the state, these educational Zone are: Anchau Educational Zone and Zonkwa educational zone. The researchers used purposive sampling in selecting four secondary schools, two from each educational zone, where one was public secondary school and the other one private secondary school. These are presented in Table 1.

Table 1. Sample Size for the Study

S/N	Educ. Zone	Name of Sec. sch selected	No. of student Sat for SSCE		
			2014	2015	2016
1	Anchau	PUBLIC: GSS Pambegua	108.	110.	95
		PRIVATE: BCSS Pambegua	44.	69	69
2	Zonkwa	PUBLIC: GSS Zangon-Kataf	116.	115.	123.
		PRIVATE: S.t. Francis Zonkwa.	78.	57.	82

Field Study, 2017.

The researchers examined their students' senior secondary certificate examination (SSCE) for three (3) consecutive years, from 2014, 2015, and 2016.

Instrument for Data Collection

Base on the research design of the study (Ex post factor), the researchers collected Senior Secondary Certificate Examination results of the sampled schools' students, using Pencil and Paper, Kayode (2002) stated that "Paper and pencil can be used to collect large amount of secondary data in a short period and in a relatively cost effective way. Paper and pencil is an instrument served to collect data in document form (hard copy) or transfer from hard copy in to raw-data form, for further analysis (Gillhan, 2008).

Method of data Collection

Data used for the study were collected with aid of checklist of students' results which indicated their academic performance in Agricultural science in various secondary schools sampled. This was gotten from Examination Officers, the results of the four schools both public and private secondary schools who sat in Agricultural Science SSCE from 2014, 2015 and 2016 were collected and analyzed.

9. RESEARCH ANALYSES

Research Question One: What is the academic performance of male students of public and privates secondary schools in Agricultural Science in Kaduna state, Nigeria?

To answer question one, data collected were analysed using mean scores and standard deviation and mean difference as shown in Table 2.

Table 2: Mean academic performance of male students of public and privates secondary school with credits pass in the years 2014, 2015, and 2016.

Types of schools	N	Mean	SD	Mean diff.
Public schools	169	28.17	10.38	4.5
Private schools	142	23.67	10.34	
Total	311	51.84	20.72	

Field study, 2017

Table 2, revealed that, the academic performance of male students of public secondary schools in Agricultural Science in the state was higher than private secondary school students in the years under review of 2014, 2015, and 2016. This showed that, male students of public secondary schools in Kaduna state performed higher than their counterpart in private secondary schools in Kaduna state, Nigeria with mean academic performance of 28.17 and standard deviation of 10.38, against that of Private secondary school students mean of 23.67 and standard deviation of 10.34.

Research Question Two: What are the academic performance female students of public and private secondary schools in Agricultural Science in Kaduna state?

Table 3: Mean Academic performance of female students of public and private secondary school students with scored credits pass in 2014, 2015, and 2016

Types of schools	N	Mean	Std Dev.	Mean Diff.
Public Schools	97	16.17	6.78	0.83
Private Schools	102	17.0	7.15	
Total	199	33.17		

Field Study, 2017.

Table 3, showed that female students of privates secondary schools in Kaduna state performed academically higher than female student of public secondary schools, they were ahead in the years under review 2014, 2015, and 2016, with the mean score of 17.0 and standard deviation of 7.15 against the female students of public secondary school that had mean scored of 16.17 and standard deviation of 6.78.

Hypotheses Testing

There are three Null Hypotheses that are postulated for the study to further probe the research questions. All the Hypotheses one, and two were tested using t-test statistical techniques.

Ho1: There is no significance difference in the academic performance of male students of public and private secondary schools in Kaduna state.

Analysis of the data used to test null hypotheses two is presented in table 4.

Table 4: t-test between academic performance of male students of public and private secondary school students in Agricultural science in Kaduna state.

Types of schools	N	Mean	Std. Dev.	Df	T-cal	T-tab.
Male students of public	169	28.17	10.38	11	3.953	2.179
Male students of private	142	23.67	10.34			

Field Study, 2017.

The results of the t-test on compare academic performance of male students of public and private secondary schools in Agricultural Science, the analyses revealed that, male students of public students had mean of 28.17 and SD of 10.38, against the private schools' students (male) that had mean of 23.67 and SD of 10.34. The t-cal value was 3.953 which were greater than t-tab of 2.179 at 0.05 level of significance.

DECISION RULE: The t-cal of 3.953 is greater than the t-tab of 2.179 at 0.05 level of significance. Therefore, the null Hypothesis is rejected: There is a significance difference in the academic performance of male students of public and private secondary schools in Kaduna state Nigeria.

Ho2: There is no significance difference in the academic performance of female students of public and private secondary schools in Agricultural science in Kaduna state, Nigeria.

To test null hypothesis two of the female students of public and private secondary schools in Agricultural Science, the analyses was presented in table 5.

Table 5: T-test on the academic performance of female students of public and private schools in Agricultural science in Kaduna state.

School types	N	Mean	Std.Dev.	DF	T-cal	T-tab
Females students of public	97	16.17	6.78	11	4.012	2.201
Females students of private	102	17.0	7.15			

Field Study, 2017.

The results in table 5 present the academic performance of female students of public and private secondary schools in Agricultural science. The female students of public schools had mean of 16.17 with SD of 6.78, while female students of private schools had mean of 17.0 and SD of 7.15. The t-cal is 4.012 which are greater than t-tab of 2.201 at 0.05 level of significance.

DECISION RULE: The t-cal of 4.012 is greater than t-tab of 2.201. Therefore, the null hypothesis is rejected; significance difference exists in the academic performance of female students of public and private secondary schools in Agricultural science in Kaduna state Nigeria.

10. DISCUSSION OF THE FINDING

The research work was on the comparative analyses of student's academic performance in Agricultural Science in public and private secondary schools in Kaduna state, Nigeria. The study had two specific objectives, two research question, and two null hypotheses. The researcher adopted Ex post factor design for collection of data the population of the study was all public and registered private secondary schools students that sat for SSCE in Kaduna state Nigeria. The instruments were Paper and Pencil for the collection of student's SSCE results. Mean score and Standard deviation were used to answer the research questions. In the test of null hypotheses, t- test statistics were used to test null hypotheses at 0.05 level of significance.

The study revealed that:

1. Male students academic performance of public secondary schools was higher when compared to academic performance of their male counterpart in private secondary schools in Agricultural Science, with the mean of 28.17 for students that had A, B, and C in their results with standard deviation of 10.38 against private school students with mean scores of 23.67 and standard deviation of 10.34. This findings was supported by Yauleni (2008), who found that, male students of public secondary school cooperated better than their counterpart in private secondary schools, that is why they always performed higher.
2. Female secondary school student's academic performance of private schools performed higher than female counterpart in the public school, they had mean scores of 17.0 with standard deviation of 7.15, while public female students' academic performance had mean of 16.17 and standard deviation of 6.78. This was in agreement with Ishemu (2012), stated that, "gender difference favour girls in private secondary schools when compared with those in public secondary schools". This also goes contrary to Uwimeiyee and Ogunbamaru (2005) who found out that, "gender has no significant effect on male and females academic performance whether in public or private secondary schools".

11. CONCLUSION

Both public and private secondary school students are doing well in their Senior Secondary Certificate Examination (SSCE) in Agricultural Science though private secondary school students performed higher than those in public secondary schools, Also research revealed that, male students of public schools performed higher than male students of private schools, but females students of private schools performed slightly higher than their counterpart females of public schools,.

12. RECOMMENDATION

1. There is need for Kaduna state government to sponsored seminar for all the secondary schools in Kaduna state (both public and privates), for a frank talk and dialogue, for the purpose of coming up with a radical plan of actions based on recognition and understanding, collaborating, and reality directed toward checkmating further reasons of academic differences between public and private secondary schools.
2. Both public and private secondary schools Teachers should be practicing the concepts of 'Improvisation' that is provision of local materials as teaching aids.

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