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# Availability and utilization of instructional materials for the teaching of agricultural science in secondary schools in Kaduna South and Chikun Local Government Areas of Kaduna State

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Abstract. Agriculture remains the bedrock of the Nigerian economy. However, the performance of students in West African Examination Council (WAEC) and National Examination Council (NECO) has been alarming in recent times (agriculture inclusive). Teaching is not complete until knowledge has been successfully transferred which in most cases may not just be tied to teacher effectiveness or teaching skill but the instructional materials used in the learning process. Therefore this study was carried out to determine the instructional materials available in secondary schools for teaching of Agricultural Science, determine the frequency of use of the said materials and the qualification of the teachers. Questionnaires were administered to 100 Agricultural Science teachers in Chikun and Kaduna South Local Government Areas of Kaduna State. The mean equation and descriptive statistics were used to analyze the data. The results showed that the available instructional materials in our secondary schools are chalkboards, charts, pictures, maps, good books in the library, excursions, real objects, rock samples, field tools and apparatus. They had mean values of 2.6 to 4.0. School farm, pH meter, exhibits and models are not easily available in our Secondary Schools (mean value 1.9 to 2.3). The study revealed that chalkboard is very frequently used in teaching of Agricultural Science (mean value 3.9). Charts, exhibits, specimens, pictures, field tools, rock samples and apparatus are used frequently in teaching of agricultural science (mean value 2.4 to 2.8). Field trips, real objects, maps, school farms, library, pH meter are used occasionally in teaching (mean value 2.24 to 2.4). The teachers teaching Agricultural Science in the studied area are qualified (mean 3 to 4). They also have teaching gualification (62%). Most of the teachers (50%) read general agriculture and have been teaching the subject for about 10 years. The schools, government and nongovernmental organizations should help in providing the instructional materials that are lacking.

Keywords: Availability, utilization, instructional materials, agricultural science.

# INTRODUCTION

Agriculture continues to be the major and certain path to economic growth and sustainability. It encompasses all aspects of human activities. It is the act, art, a cultural necessity and science of production of goods and services through cultivation of land and management of plants and animals which creates an activity web-chain that satisfies social and economic needs.

Agriculture is the mainstay of mankind; therefore wise nations all over the globe give it a priority, developing and exploiting this sector for the upkeep of their teeming populations through the earning of revenue for development purpose; as well as employment for stemming down crimes, corruption and other forms of indiscipline which work against all factors of life, living and most of all economic productions. Bawa and Saidu (2002) opined that the last solution to our food problem would unavoidably involve the young ones (youth) who would be farmers of tomorrow. The objectives of agricultural education in secondary schools in Nigeria include stimulation of students' interest in agriculture. Enable students to acquire basic knowledge and skills in agriculture, expose students to opportunities in the field and prepare students for further studies and employment in agriculture (William, 2004).

Community programme recommended that each student be guaranteed adequate equipment; farm space, farm structures and regular school should own a farm, horticultural garden, two animal production projects. Within the body of the curriculum instructional materials such as charts, models, pictures, rock samples, pH meter, litmus paper, apparatus for various soil and plant experiment. Agrochemicals are required for teaching. However, schools have not been provided with the recommended materials neither do they have the where withal to undertake the numerous trips and excursions. For the effective teaching of agricultural science in schools, the needed materials have to be supplied just like was the case with introductory technology and other vocational subjects (William, 2004).

Because of the important role of agriculture in the development of this country, the programme has been undergoing development. More so, that Agricultural Science is one of the subjects in Junior and Senior Secondary Schools; and as a vocational subject, it cannot be taught effectively without the use of appropriate instructional materials (Ajayi, 1988).

However, the agricultural education in Nigerian Secondary schools is still non vocational because the theoretical portion outweighs the practical portion (Udo, 2000). The teaching of agriculture can be made more effective by the use of locally available aids. The persistent call by science educators as far back as two decades ago to improvise simple science equipment for use at the primary schools levels is a clear indication of their non-availability. Although all teachers use some visual aids, many do not use nearly enough but relying too heavily on words and ignoring the powerful effect of signs on understanding and recalling (Onazi, 1983). Instructional materials are the devices developed or acquired to assist or facilitate teachers in transmitting organized knowledge, skills and attitudes to the learners within an instructional situation (Nwachukwu, 2006). It is not enough for the instructional materials to be available in schools; they must be put to use in order to enhance the facilitation of learning on the part of the learners. When instructional materials are properly used in teaching they help to cohere abstract concepts and put

the elements of reality into ideas that may seem impracticable (Akinbade, 1999). It is also believed that they help the learners' memory such that they easily recollect what they were taught when the idea is needed. Literature has confirmed that instructional materials of all types and forms enhance students' academic performance in various subjects (Adeyanju, 1991; Salawu, 1999).

The decay or decadence of academic performance in Primary, Secondary and Tertiary institution in Nigeria is alarming mainly in science subjects. The performance in agric science was said to be below average (dailyindependentnig.com). The performance of students in agricultural science and practical agriculture in high schools in Nigeria is not encouraging (Ikot, 2008). Ikot observed that the poor performance of students in agriculture examinations may not be unconnected with non-utilization of suitable instructional materials. Learning is facilitated when the learners make use of at least three of the sense organs: seeing, hearing and touching.

Few studies have been devoted to evaluating the availability and utilization of instructional materials and resources in the teaching of Agricultural Science in Secondary in Kaduna State, Nigeria. At the threshold of the millennium, Agricultural Science teachers face both old and new challenges and the need to evolve strategies to engage learners in activities that are active, meaningful and challenging. Based on the above information, this study was designed to explore the ways of improving the use of instructional materials in teaching Agricultural Science in our Secondary Schools, their frequency of use and qualifications of teachers.

# MATERIALS AND METHODS

The study was carried out in Chikun and Kaduna South Local Government Areas of Kaduna State. One hundred questionnaires were administered to agricultural science teachers in the area data of study. The respondents were selected randomly to avoid bias. Data was sought on respondents' personal data, available instructional materials and frequency of use of the instructional materials. The instrument developed was subjected to reliability and validation tests. The mean equation and four point Likert scale were used to analyze the data.

The determining decision points were as follows: 3.5 to 4.5 - Strongly agree; 2.5 to 3.4 – Agree; 1.5 to 2.4 – Disagree; 0.5 to 1.4 - Strongly disagree.

#### **RESULTS AND DISCUSSION**

#### Available instructional materials

The available instructional materials in our secondary schools are the chalkboards, charts, pictures, litmus

S/ no.	Instructional material	Mean value	Remark
1	Chalkboard	4	Strongly agree
2	Charts	2.8	Agree
3	School farm	2.3	Disagree
4	Exhibits	2.1	Disagree
5	pH meter	1.9	Disagree
6	Pictures	2.8	Agree
7	Litmus paper	2.6	Agree
8	Maps	2.8	Agree
9	Good books in the library	2.6	Agree
10	Excursions	2.8	Agree
11	Real objects	2.6	Agree
12	Specimens	2.7	Agree
13	Rock samples	2.6	Agree
14	Field tools	2.8	Agree
15	Apparatus	2.9	Agree
16	Models	2.3	Disagree

Table 1. Available Instructional materials in our secondary schools.

paper, maps, good books in the library, excursions, real objects, rock samples, field tools and apparatus (Table 1). These instructional materials have mean value of 2. 6 to 4.0. The instructional materials that are not readily available are school farm, pH meter, exhibits and models. These materials are expensive to buy or establish. The result corroborates the findings of Asogwa et al. (2013) that chalkboard, pH meter were available in secondary Schools in Benue State, Nigeria.

# Frequency of use of instructional materials

The results in Table 2 showed that chalkboard is used very frequently. Charts, exhibits, specimens, pictures, field tools, rock samples and apparatus are used frequently in teaching. Field trips, real objects, maps, school farms, library, pH meter are used occasionally in teaching agricultural science in our secondary schools: 0.5 to 1.4 - rarely used; 1.5 to 2.4 - occasionally used; 2.5 to 3.4 – frequently; 3.5 to 4.4 - Very frequently.

# **Qualifications of teachers**

The result in Table 3 shows that the teachers in the studied area were qualified. The teachers have teaching qualification. The teachers were enough and also teach other subjects.

# **Qualifications of agricultural teachers**

The result in Table 4 show that majority of the respondents were qualified to teach agricultural science.

# Area of specialization

The result of the respondents' area of specialization in Table 5 shows that majority of the respondents read general agriculture and few read agricultural engineering.

# Working experience

The results in Table 6 show that the respondents have good working experience. Majority (41%) had worked for five years. Thirty three percent had worked for 10 years. Only few (13%) had worked for more than 16 years.

# DISCUSSION

Based on the data collected and analyzed, the following findings were made by the study. Twelve out of the sixteen instructional materials required for teaching agricultural science in secondary schools are available. The instructional materials not available are school farm, exhibits, pH meter and models. These instructional materials are the most needed and essential for effective teaching of agricultural science. This confirms Bawa and Saidu (2002) view that schools have not been provided with the recommended instructional materials neither do they have the wherewithal to undertake the numerous field trips and excursions. He further stated that for effective teaching of agricultural in schools the needed materials have to be provided. According to Oni (1992), facilities constitute a strategic factor in organizational functioning. This is so because they determine to a very large extent the smooth functioning of any social organization or system including education. He further

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S/no.	Instructional materials	Mean value	Remark
1.	Chalkboard	3.9	V. frequently
2.	Charts	2.8	Frequently
3.	School farm	2.24	Occasionally
4.	pH meter	2.49	Frequently
5.	Pictures	2.6	Frequently
6.	Litmus	2.4	Occasionally
7.	Exhibits	2.5	Frequently
8.	Maps	2.24	Occasionally
9.	Good books in library	2.4	Occasionally
10.	Excursions	2.3	Occasionally
11.	Real objects	2.45	Occasionally
12.	Specimens	2.6	Frequently
13.	Rock Samples	2.6	Frequently
14.	Field Tools	2.5	Frequently
15.	Apparatus	2.73	Frequently
16.	Models	2.3	Occasionally

Table 2. Frequency of use of instructional materia	ıls.
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0.5 to 1.4 - rarely used; 1.5 to 2.4 - occasionally used; 2.5 to 3.4 - frequently; 3.5 to 4.4 - Very frequently.

 Table 3. Distribution of agricultural teachers according to their teaching qualifications.

S /no.	Items	Mean value	Remark
1.	Teachers qualified	3.4	Agree
2.	Teaching qualification	2.96	Agree
3.	Teach other subjects	2.99	Agree

Table 4. Distribution of agricultural science teachers according to their qualifications.

S/no.	Qualifications	No. of respondents	Percentage
1.	B.Sc/B.Ed	39	44.3
2.	B.Sc/HND plus teaching	24	27.3
3.	HND	15	17
4.	NCE	8	9
5.	M.Sc	2	2.3

Table 5. Distribution of the respondents according to area of specialization.

S/no	Area of specialization	No. of respondents	%
1.	B.Sc general agric	44	50
2.	Agronomy	15	17
3.	Animal Science	14	16
4.	Agric Econ. and Ext.	8	9
5.	Agric Engineering	7	8

stated that their availability, adequacy and relevance influence efficiency and high productivity. Writing on the role of facilities in teaching, Balogun (1982) admitted that no effective science education programme can exist

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without equipment for teaching. This is because facilities enable the learner to develop problem-solving skills and scientific attitudes. In their contribution, Lockheed and Verspoor (1991) reiterated that when facilities are provided

S/no.	Years of service	No. of respondents	%
1.	0 – 5	47	41
2.	6 - 10	29	33
3.	11 -15	12	14
4.	16 above	10	13

**Table 6.** Distribution of the respondents' according to of working experience.

to meet relative needs of a school system, students will not only have access to the reference materials mentioned by the teacher, but individual students will also learn at their own paces. The net effect of this is increased overall academic performance of the entire students.

In his words, Farombi (1998) opined that the wealth of a nation or society could determine the quality of education in that land; emphasizing that a society that is wealthy will establish good schools with quality teachers, learning infrastructures that with such, students may learn with ease thus bringing about good academic achievement. In his study on resource concentration, utilization and management as correlates of students learning outcomes in Ovo State, Farombi (1998) found that the classroom learning environment in some schools was poor. He cited examples of schools without chalkboard, absence of ceiling, some roofing sheets not in place, windows and doors removed among others, a situation which the researcher regarded as hazardous to healthy living of the learners. According to Nigerian Tribune on Thursday 25 November 1999, in caption; Mass Failure will Continue until..." the chairman of the National Committee of WAEC, Dr. U.B. Ahmed opined that the classroom is the origin of failure... a close look at the public schools and what goes on there shows that nothing good can come out of most schools as they do not have facilities, adequate and appropriate human resources to prepare candidates for WASCE. The above statement indicates that the problem of candidates' mass failure in WAEC's organized examination will continue until the situation of the nation's public schools change for the better. Writing on how to improve primary education in developing countries, World Bank publication (1990), linked performance of students to the provision of adequate facilities while referring to a survey of 51 primary schools in Botswana that students performed significantly better on academic tests when they had adequate classrooms, desks and books. Earlier, Fagbamiye (1979) attesting to why students' performance standard fall observed 559 cases from 13 secondary schools in Lagos State using age, type of school (Day or Boarding, mixed or single sex), teachers qualification and teaching experience as well as intake quality using students' entrance examination achievement. His findings revealed that schools which are equipped had good records of achievement and attracted more students. He concluded that good quality schools in terms of facilities

and younger students' intake perform better in WASCE. Commenting on why high academic attainment is not in vogue in Nigeria, Adesina (1981) identified poor and inadequate physical facilities, obsolete teaching techniques... overcrowded classrooms among others, as factors. Throwing more light on school facilities and moral guiding provision, Fabunmi (1997) asserted that school facilities when provided will aid teaching learning programme and consequently improve academic achievement of students while the models guiding their provision to schools could take any form as rational bureaucratic and or political model. Writing on poor performance of students in public examinations, London (1990) stated that in many developing nations certain physical facilities are none existent, and that those instances where amenities are available many are of sub standard quality. Lamenting on the glowing inadequacies of school facilities in our educational industry, scholars (Wilcockson 1994, Lawal 1995, Ajayi 1996, Suleiman 1996) have variously identified the significance of facilities in teaching learning spheres. We can say that absence or poor (and or deteriorating) quality of educational facilities can affect academic performance. According to Hallack (1990), facilities form one of the potent factors that contribute to academic achievement in the school system. They include the school buildings, classroom. accommodation. libraries. laboratories. furniture, recreational equipment, apparatus and other instructional materials.

Some of the recommended instructional materials are used frequently for teaching of agricultural science in our schools. They include exhibits, charts, specimens, pictures, field tools rock samples, and apparatus. Other instructional materials are used occasionally. They are school farms, library, models, pH meter, and litmus paper. These instructional materials are among those recommended by the curriculum. They have to be used frequently. This agrees with the findings of Saidu and Bawa (2002) that there is a variation in the entry behaviour of people, thereby creating a learning gap. However, the use of a variety of instructional material during teaching gives opportunity for closing this gap and provides an even platform for learning despite the difference in entry behaviour. Further pupils pay more attention to what is of interest to them. Therefore a way has to be sought of arousing pupils' interest. lkot (2008) reported that learners can learn from good quality pictures with or without the help of teachers. According to

Okechukwu (1997), students taught with instructional pictures performed better than their counterparts taught without pictures.

Teachers teaching Agricultural Science are qualified. They have teaching qualifications and are graduates of general agriculture. The teachers are therefore competent if given the necessary instructional materials.

#### Conclusion

The findings revealed that some of the instructional materials required for teaching Agricultural science are not available. There are enough qualified teachers but no required instructional materials for use in teaching. This therefore means that human resources are not fully utilized.

#### RECOMMENDATIONS

improve their availability.

 The instructional materials that are not available should be provided, especially the school farm it is in the school farm that practical knowledge of agriculture is imparted. This is necessary to make agriculture interesting hence improve the r performance of students.
 Teachers should be trained on how to make instructional materials with local resources. This will

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