



Perceived Effectiveness of Audio Instructional Materials for Teaching Agricultural Science at Senior Secondary Schools level

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ABSTRACT

The purpose of the study was to find out male and female teachers' perception of the effectiveness of Audio instructional materials used in teaching Agricultural Sciences in Senior Secondary Schools in Gombe State. Literatures were reviewed to explore opinions and argument relating to the study. The population of the study was 143 Agricultural science teachers, made up of 111 males and 32 females. Structured questionnaire which was validated by experts and tested for internal consistency and reliability using Cronbach's alpha formula which indicated 0.99 was adopted. Two research questions and a hypothesis, formulated and tested at 0.05 level of significance guided the study. The data were analyzed using mean (\bar{X}) statistics and standard deviation, while the Z-test was used to test the null hypotheses. Findings revealed that: 1) male and female teachers perceived the use of audio instructional materials as effective at grand mean of 2.18 and 2.05 respectively, 2) There was no significant difference between the mean responses of male and female teachers' perception on the effectiveness of audio instructional materials used in teaching Agricultural Science in the study area. The study recommended that teachers should endeavor to use audio instructional materials in teaching Agricultural Science in Senior Secondary Schools.

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INTRODUCTION

Experience and research show that learning take place faster and more easily in real life situation through primarily the sense of sight, hearing and touch. At all levels of education, instructional materials are very important in the attainment of desired goals and objectives. The traditional chalk-talk method of teaching involves only the sense of hearing and students easily lose interest after sometime. However, the utilization of instructional materials in the teaching and learning situation involves not only the sense of sight and touch.

The advent of modern science and technology and the development of state of the arts instructional materials have brought to the fore, the need for the application of instructional materials in teaching Agricultural Science in Secondary Schools so as to bring about desired outcome in class room in terms of improved understanding of scientific principles and concepts. However, females remain

important figures in the teaching profession as gender issues are becoming paramount issues of discuss internationally (Mohammed, 2016). The Nigerian Population census revealed that almost half of Nigeria's one hundred and forty million people are women (NPC, 2006). Therefore, an investigation into the perception of male and female Agricultural teachers in the use of Audio instructional media in teaching Agricultural Science in Senior Secondary School in Nigeria in general, and Gombe State in particular promises to be an interesting avenue for research to seek a way forward.

In their study of the impact of Agricultural Science teacher's computational skills on student's learning outcomes in Secondary Schools in Nigeria, Famiole, Odu, Popoola, and Ayodele (2014) observed that teachers with more years of experience had been observed to be able to teach more effectively than the beginning teachers. This may be attributed to the experienced teacher's

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realization of the importance of the use of instructional materials in teaching. Similarly, Idowu (2010) examined and compared factors influencing the use of Instructional materials by Agricultural teachers among Public and Private Secondary Schools in Botswana and concluded that the availability of instructional materials was higher in private schools than in public schools, but teachers in public schools were more favourably disposed to instructional materials use than teachers in private schools. On the other hand, Whitelaw, Milosevic, & Daniel (2000) argued that teacher's sex is an important variable related to pupil's performance. Thus, gender traits in boys and girls have been shown to have influence on their attitude towards Agricultural Science. There is a bias that majority of females still choose not to opt for Agricultural science. The differences in the persistence of males and females studying Agricultural Science have been a topic of concern to researchers in Agricultural Science Education for years. Similarly, it has been observed that male teachers have more positive attitude towards the teaching of Agricultural Science, achieve better and have higher preferences for Agricultural practical's and Mathematical problem solving in Agriculture than female teachers. Gender in this case is the behavioral, cultural or psychological traits associated with one's sex.

Mohammed (2016) argued that effective teaching of any subject will not only stimulate students' interest in the subject but also enhance their achievement in examination, stressing that to achieve effective teaching and learning process, there is need for used of instructional materials. However, for a material to be very effective, it must be available, easy to use, well maintained, adequately funded, and experts must be available. Agricultural Science being an applied Science involves a lot of simple tests and activities which the students must be involved in at Secondary School level so as to acquire the necessary skills and experience. According to Ibitoye (1985) Agricultural Science is generally considered by the students as one of the labour sapping subject. He stated that there is a close link between theories and practical, the experience gained from practice is used to enrich knowledge and ideas.

Thus, this study gives better understanding about the current perception of effectiveness of instructional media used in teaching Agricultural Science in Senior Secondary Schools in Gombe State

by examining their effectiveness, the experiences of Agricultural students/teachers, and the contributions of stakeholders (school administration/ state government) in Gombe State, Nigeria towards use of instructional media. Specifically, this is achieved by determining male and female teachers' perception of use of instructional media in teaching Agricultural Science and determining curricular areas of improvement in the use of instructional media that would enhance prospect for their use in line with international best practice.

The problem investigated in this study is that although instructional material otherwise known as teaching aids are meant to promote easy assimilation of knowledge by the students and facilitate the teaching and learning process, preliminary investigations, questions whether the use of Audio instructional materials has indeed significantly been perceived by teachers as effective in the teaching of Agricultural Science in Senior Secondary Schools.

Prior to the advent of information communication technology (ICT) teachers had spearheaded teaching of Agricultural Sciences using pedagogical means, setting universal approach at the forefront. Researches on the use of instructional media are still ongoing, some focus on one (Audio) instructional media (Agbam, 2006; Nasibi & Kii, 2004), while other previous works focus on two instructional media (Audio and visual) (NTI, 2005; Anzaku, 2011; Swank, 2011) as such their results may not be generalized. Moreover, studies into the use of instructional media has become increasingly important due to world development focus on it as a panacea for enhancing the effectiveness of teaching and learning that would ultimately contribute towards improving quality education, equity, restoring the environment and global collaboration. In line with that, projecting the effectiveness of use of instructional media and their future possibilities in developing economies such as Nigeria has been an area of interest in educational literature.

Agricultural Science being a vocational subject requires appropriate use of instructional materials before any meaningful teaching/learning can take place. Though there is a lot of importance attached to the usage of instructional materials in teaching Agricultural Science especially in Senior Secondary Schools, unfortunately, most Agricultural Science teachers either use few or none at all for

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teaching their students. The major problem in our system of education is that, Science is presented theoretically in most schools, as a result the student find it difficult to relate what they learnt to real life situations (Etuk, 1984). This statement agrees with that of Farauta (2007) who reported that students' performance are better when they are taught with instructional materials, as they are seen as the heart of learning in Secondary Schools. The uses of instructional materials help instill confidence in the students besides teaching them theory. The adoption of verbalistic and theoretical method as a way of teaching and learning of Agricultural Science has been viewed in some quarters as a sign of weakness or apparent ineffectiveness of the use of Audio instructional materials in teaching Agricultural Science in Senior Secondary Schools. Although much research has been conducted on the potential benefits of instructional (Audio-visual) materials on students' performance, sufficient attention has not been paid to the gender aspect in terms male and female teachers' perception of the efficacy of Audio instructional materials used in teaching Agricultural Science in Senior Secondary Schools, hence the motivation for this study.

Objectives of the Study

The objectives of this study are:

- i) To determine the perception of male teachers on the effectiveness of Audio instructional materials used in teaching Agricultural Science in Senior Secondary Schools in Gombe State and
- ii) To determine the perception of female teachers on the effectiveness of Audio instructional materials in teaching Agricultural Science in Senior Secondary Schools in Gombe State.

METHODOLOGY

A survey design was used for the study. Yalams and Ndomi (2000) defined survey research as the gathering of information about a large number of people or objects by studying a representative sample of the entire group. The survey research design was adopted for this study because it allowed generalization to be made on the population of the study. Obasi (1999) also stated that survey research permits generalization to be made on wider population even when a sample is studied. The study was conducted in Gombe State which was created on 1st October 1996, with Gombe town as its capital. The State is located between latitude 9^o 30 and 12^o 30N and longitude 8^o 45 and 11^o45E. Gombe State has an estimated population of 2.8 million people (N.P.C., 2008) made up of different people with many languages. The land area is 20,265 square kilometers. It shares boundary with Bauchi State by the West, Yobe State by the North, Borno State by the East, and Taraba and Adamawa States by the South, all in the North-Eastern part of Nigeria Ministry of Land and Survey (M.O.L & S., 2014). Gombe State has eleven Local Government Areas and three educational zones namely; Gombe Central, Gombe North and Gombe South. There are ninety-eight governments owned Senior Secondary Schools in Gombe State (M.O.E., 2014).

The target population for the study was 143 Agricultural Science teachers, which consisted of males and females from all Government Secondary Schools in Gombe State as at 2014/2015 academic session. The entire population was used; therefore, no sampling was done. According to Osuala (2005) in a study where the population is small and can be managed, no sampling should be involved. However, a breakdown of the population of the study is presented in Table 1.

Table 1: Population of Agricultural Science Teachers from all Government Secondary Schools in Gombe State.

Educational zone	Number of schools	Number of agricultural science male teachers	Number of agricultural science female teachers
3	98	111	32

Source: Ministry of Education, (MOE) Gombe State (2014).

The study adopted and used the purposive sampling technique where the entire population was

considered because it was manageable. The total population for the study was 143 Agricultural

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Science teachers in 98 Senior Secondary Schools in Gombe State. A structured questionnaire was developed as instrument for data collection for the study. The questionnaire was divided into two parts (A and B). Part A was designed to request for personal data of the respondent while part B of the questionnaire consisted of three sections structured to obtain information that provided answers to the two (2) research questions. The five-point rating scale of: very effective (5), effective (4), moderately effective (3), barely effective (2) and not effective (1) was used for the study.

The instrument was validated by three lecturers in the Departments of Vocational Education and Science Education of Modibbo Adama University of Technology, Yola. The experts were requested to assess the questionnaire items for appropriateness, depth and clarity of language, with a view to provide general observation, criticisms and advice. Thus, the inputs of the experts were used to produce final copy of the questionnaire.

The consistency of the final draft of the instrument was determined through pilot test. A single test was carried out on 25 respondents which comprised of 7 females and 18 males Agricultural Science teachers drawn from Government Secondary Schools in Adamawa State which is outside the study area.

The reliability of the instrument was determined using Cronbach alpha formula.

Mean was used to answer the two (2) researcher questions while Z-test was used to test the Null hypotheses at 0.05 levels of significance. The real limits of numbers were applied to obtain the various levels of effectiveness. Grand mean was used to obtain the overall level of effectiveness in each of the two research questions. The data collected were analyzed using mean (\bar{X}) statistics in order to answer the two (2) researcher questions and standard deviation to answer the two (2) research questions, while the Z-test was used to test the Null hypotheses at 0.05 levels of significance. In addition, the real limits of numbers were applied to obtain the various levels of effectiveness, thus the Grand mean was used to obtain the overall level of effectiveness in each of the two research questions.

RESULT AND DISCUSSION

Research Question 1: What is the perception of male agricultural science teachers on the effectiveness of Audio instructional materials used in the teaching of Agricultural Science in Senior Secondary Schools?

This RQ was answered by the data on table 2, which indicates that male teachers perceived the use of Audio instructional materials (i.e items 1 to 9) used in teaching Agricultural Science as barely effective with Grand mean (\bar{X}_G) of 2.18, implying that male teachers perceived use of Audio instructional materials as barely effective.

Table 2: Mean Responses of Male Teachers' Perception on the Effectiveness of Audio Instructional Materials used in Teaching Agricultural Science in Senior Secondary Schools n=111

S/N	Items	\bar{X}	σ	Remark
1	Effectiveness of radio	2.58	1.52	BE
2	Effectiveness of tape recorder	2.27	1.22	BE
3	Effectiveness of audio tape	2.36	1.29	BE
4	Effectiveness of tape text	1.68	1.00	BE
5	Effectiveness of tele-conferencing	1.95	1.13	BE
6	Effectiveness of language laboratories	2.50	1.58	BE
7	Effectiveness of headphone	1.86	1.19	BE
8	Effectiveness of microphone	2.57	1.59	BE
9	Effectiveness of telephone	1.88	1.33	BE

Source: Field work; Mohammed (2016).

Research Question 2: The research question: "What is the perception of female Agricultural Science teachers on the effectiveness of Audio instructional materials used in the teaching of Agricultural Science in Senior Secondary Schools?"

The research question was answered by the result presented on table 3, which indicates that female teachers perceived the use of Audio instructional materials (items 1 to 9) used in teaching Agricultural Science as barely effective with

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Grand mean total (\bar{X}_G) of 2.05. This implies that female teachers perceived the use of Audio

instructional materials in teaching Agricultural Science as barely effective.

Table 3: Mean Responses of female Teachers' Perception of Effectiveness of Audio Instructional Materials used in Teaching Agricultural Science in Senior Secondary Schools

S/N	Items	\bar{X}	σ	Remark
1	Effectiveness of radio	2.72	1.63	BE
2	Effectiveness of tape recorder	2.31	1.06	BE
3	Effectiveness of audio tape	2.44	1.50	BE
4	Effectiveness of tape text	1.59	0.95	BE
5	Effectiveness of tele-conferencing	1.50	0.76	BE
6	Effectiveness of language laboratories	2.13	1.64	BE
7	Effectiveness of headphone	1.91	1.28	BE
8	Effectiveness of microphone	2.44	1.66	BE
9	Effectiveness of telephone	1.44	1.05	BE

Grand mean (\bar{X}_G) = 2.05
Source: Field work; Mohammed (2016).

Hypothesis: There is no significant difference between the Mean responses of male and female teachers' perception on the effectiveness of audio instructional materials used in the teaching of Agricultural Science in Senior Secondary Schools in Gombe State.

The data used in testing the hypothesis was presented in Table 4. The table shows the value of Z-calculated of 1.25 is less than the Z-critical value of

1.96 at 0.05 levels of significance. Thus, the Null hypothesis was accepted and the alternative hypothesis rejected. Therefore, there is no significant difference in the Mean rating of male and female teachers' perception on the effectiveness of Audio instructional materials used in the teaching of Agricultural Science in Senior Secondary Schools in Gombe State.

Table 4: Z-test of the Difference between the Mean Responses of Male and Female Teachers on Effectiveness of Audio Instructional Materials used in Teaching Agricultural Science in Senior Secondary Schools N = 143

Respondent	N	\bar{X}	σ	Df	Z-cal	Z-crit	Remark
Male	111	19.65	8.61	141	1.25	1.96	Accept Ho
Female	32	17.69	7.57				

Source: Field work; Mohammed (2016).

The Z-test analysis for hypothesis 1 revealed that there was no significant difference between the Mean responses of male and female teachers' perception of the effectiveness of Audio instructional materials used in the teaching of Agricultural Science in Senior Secondary Schools in Gombe State. This may be attributed to the fact that a good knowledge of modern practices and the use of instructional materials is an invaluable asset in the Agricultural Science teacher's tool kit. This is also in conformity with the finding of Etim (2006) who posits that learners can learn more easily and retain the information longer when concepts and other

subject matters are presented using instructional aides. The finding is also in consonance with the finding of Esu (2004) that ordinary words of verbalization without the use of instructional materials has been found to be inadequate for effective teaching but contrary to Nnolim (1998) who stated that gone was the days when textbooks and blackboard were used in the instructional situation. For this study, the finding stated that Audio instructional materials are barely effective. The Agricultural Science teachers need experience, exposure, and in-depth knowledge of the subject

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matter and the relevance of the instructional materials as revealed by the finding of the study.

CONCLUSION

Based on the results of the study, it is clear that the teachers in the study area perceived the use of Audio instructional materials as effective in teaching Agricultural science. This reinforced the assertion that "importance of the use of instructional materials in teaching Agricultural Science in Senior Secondary Schools cannot be over emphasized".

Furthermore, the study revealed that inappropriate use of instructional materials has many negative effects on both the teachers and students which include: misunderstanding, confusion and under achievement of specified objective. The outcome of the study is in agreement with the conclusion reached by Idowu (2010) in his study of factors influencing the use of instructional materials by Agriculture teachers among public and private Secondary Schools in Botswana as he stated among others that the availability of instructional materials was higher in private schools than in public schools, but teachers in public schools were more favorably disposed to instructional materials use than teachers in private schools. However, Idowu (2010) argued that important predictors of use of instructional materials are availability, and attitude towards use of instructional materials. This implies that proper usage of instructional materials could lead to student understanding, increased interest in learning process, recognition of facts, teaching enhancement and achievement of instructional and educational objective in general.

RECOMMENDATIONS

The following recommendations were made based on the finding of the study.

1. Teachers should endeavour to use and maximize the benefits of audio instructional materials in teaching Agricultural Science, as they acknowledge their benefits in terms

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of quick understanding by the students and be used properly in relation to the topic being taught. However, creating teachers' awareness and willingness to follow the instructions for use of instructional materials may also be a very efficient instrument.

2. Teachers should adopt the learning-by-doing approach in the use of audio instructional materials, for example by having trained staff at the school to help Agricultural Science teachers use the instructional materials correctly.
3. In order to encourage teachers to use audio instructional materials in teaching Agricultural Science, legal and economic incentives may be employed to change teacher's behavior. The aim could be to create incentives for the teacher to change their current behavior so that they can use the instructional materials in teaching. In the event of non-compliance, taxes, charges and fees are common economic incentives which could be applied to defaulting teachers.
4. Finally, School authorities schools should adopt teaching/learning improvement measures such as: establishing firmly the requirements and features of the instructional materials to be purchase for use at the onset of the academic session, preparing teachers to do their best by getting them to sign off on capabilities and responsibilities, effective human resource management through effective motivation, and monitoring/evaluation of use of instructional materials, involving discerning early which instructional materials are not effective in terms of facilitating teaching and learning and applying early corrective actions.

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