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| **APPRAISING EFFECTIVE UTILIZATION OF INSTRUCTIONAL MATERIALS FOR TEACHING AND LEARNING OF AGRICULTURAL SCIENCE IN SENIOR SECONDARY SCHOOLS IN GOMBE STATE, NIGERIA**Manzo Crew Dennis1, Egunsola, A. O. E2, Sarki, R.A3Ministry of Education, Gombe State1Department of Vocational Education, Modibbo Adama University, Yola, Adamawa State, Nigeria2.3E-mail: isaacjohn@mautech.edu.ng  |
| **ARTICLE INFO** Received: March 17, 2023Revised: March 21, 2023Approved: March 25, 2023 | **ABSTRACT** The purpose of this study was to appraise the effective utilization of instructional materials for teaching and learning of Agricultural Science in senior secondary schools in Gombe State, Nigeria. The study which was descriptive survey research was conducted in Gombe State and was guided by three research questions and three null hypotheses. The population of the study was 406 respondents involving 184 agricultural science teachers and 222 school administrators from the 74 senior secondary schools in Gombe State. The sample size of the study was 196 respondents determined using Krejcie and Morgan (1970) sample size table. A structured questionnaire was used for data collection. 0.84 reliability index was obtained from the trial test of QEUIMTLASSSS using Cronbach Alpha. Data collected for the study was analyzed using Mean statistics and t-test. Findings of the study revealed among others that Out of the 26 items listed, only 16 items namely: school farm, watering cans, plant lifters, planting hoes, etc. were functional for teaching and learning of Agricultural Science in secondary schools in Gombe State; while Instructional materials such as school farm, watering cans, plant lifters, and shovels were highly utilized for teaching and learning of Agricultural Science in Secondary Schools in Gombe State. It was recommended, Secondary Schools' administrators in Gombe State should reward teachers who form good habit of maintaining available instructional materials in the school; Ministry of Education in Gombe State should increase supervision of lessons and review teachers' workload in order for teacher to be able to examine their students' academic progress and performance as the use of instructional materials have significant effect on the students' academic performance.**Keywords: Effective Utilization;**  **Instructional Materials; Teaching;**  **Learning Agricultural Science; Senior Secondary Schools**  |
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**INTRODUCTION**

Agriculture embraces health, nutrition and food consumption, the use and conservation of land, water resources, and environmental characteristics of the food and fibre system. (Bareja, 2014), defined agriculture as a deliberate effort made by man to till the soil, cultivate crops and rear animals for food and other purposes. Agriculture is defined as the cultivation of land for the purpose of producing food for man, feed for animals and fibre or raw materials for our industries. It also includes the processing and marketing of crops and animal products (Ndem, 2013).

According to Omeje (2016), agricultural science is the art and science of growing crops and rearing of animals for man's use. It includes the processing, marketing, storing and transportation of crops and animals and their by-products. According to (Bareja, 2014), agriculture may be defined as "the art and science of growing plants and other crops and the raising of animals for food, other human needs, or economic gain". The main importance of agriculture is food. Other purposes of agriculture include clothing, medicines, tools, aesthetic value or for profitable gains (William, 2018). The continuous engagement in farming requires knowledge in the science of agriculture and is important for future production. This helps to make decisions as to what to produce and how to produce it (Barrick, 2012).

The Federal Government of Nigeria [FGN] (2013) included agriculture as a pre-vocational subject at the primary and junior school and as a vocational subject in the senior secondary Also, Agricultural Science acquired the status of a vocational subject and is one of the subjects offered in junior and senior secondary school, as a pre-vocational elective and vocational elective respectively (FGN, 2013). The curriculum content of the senior school level was structured to focus on three major areas: production (food production), projection (agronomy and forestry) and economics (agricultural economics and farm management). It is one of the elective subjects students can choose at senior secondary levels and this is to enable interested students to acquire practical agricultural skills that would make them self-reliant.

According to (Egbule, 2004), the objectives of Agricultural Science education at secondary level include to stimulate students interest in agriculture; develop basic agricultural skills in students; enable students acquire basic knowledge of agriculture; enable students to integrate knowledge with skills in agriculture; expose students to opportunities in the field of agriculture; prepare students to opportunities in the field of agriculture and to prepare students for further studies. The objectives of Agricultural Science is not only to produce professional and skilled manpower but, also to educate the rural community with the aim of ensuring complete transformation of agricultural production from the subsistence level to mechanized agriculture through effective teaching.

Teaching is a system of action involving an agent, an end in view, and a situation including two sets of factors (those over which the agent has no control such as class size, size of classroom, physical characteristics of pupil) and those that the teacher can modify (such as ways of asking questions, ways of applying instructional materials or ideas gleaned). Mohammed, Isaac and Ferdiinand (2019) defines teaching as undertaking certain ethical tasks or activities, the intention of which is to induce learning. According to Tamakloe, Amedahe and Atta (2005), teaching is the art of directing knowledge towards the learner. To (Mele, 2021) teaching is not a mechanical process but a rather intricate, exacting and challenging job. Though teaching is poorly paid, Kochhar explains that its riches are of a different order, less tangible but more lasting (that is satisfaction of personal fulfillment). (Opoku-Asare et al., 2022) explain teaching as a "process that facilitates learning". Teaching and learning are therefore described as the two sides of a coin because teaching does not happen without a learner.

Mohammed, Isaac and Yusuf (2019) describe a learner as a novice who is willing and have desired to learn. (Akiri, 2013) described learning as the degree of attainment by student in schools, either in class, laboratory, library, project or field work in which the student is sufficiently exposed to. Oruc (2011) perceives learning as a test for the measurement and comparison of skills in various fields of academic study. Hence learning could be described as a task which has been accomplished successfully, especially by means of exertion, skill practice or perseverance.

According to Nzeribe (2012), for teaching and learning to be lasting and learned lesson retained, it is imperative for the teaching and learning process to be realistic and not abstract to the learner. Hence, Nzeribe recommended the use of instructional materials.

Various schools of taught have explained instructional materials in different ways or forms. An instructional material is anything that can serve as an object of interest that a teacher uses for the purpose of passing instructions in the classroom to achieve set educational objectives (National Teachers' Institute [NTI], 2010). Instructional materials represent all the alternative channels of communication which we can use to compress and represent information in a more vivid form (Iya, 2015). As illustrated by Majid, (2014), instructional materials are any kind of aids that assist in the teaching and learning activities, which include reference books, counting equipment like blocks, stones or beads, natural displays models, charts, pictures, play materials, games, audio visual equipment. Iya (2015) says that the teacher's work as communicator, model and identification figure can be supported by a wised use of variety of devices that expand experience, clarify it and give it personal significance.

Utilization according to Uzuegbu, Mbadiwe, Anulobi (2013), is the primary method by which asset performance is measured and business determined. It is the transformation of a set of input into goods or services. It involves creation of value in things. Various schools of taught have explained instructional materials in different ways or forms. An instructional material is anything that can serve as an object of interest that a teacher uses for the purpose of passing instructions in the classroom to achieve set educational objectives (NTI, 2010). Instructional materials represent all the alternative channels of communication which we can use to compress and represent information in a more vivid form (Iya, 2015). Instructional materials are any kind of aids that assist in the teaching and learning activities, which include reference books, counting equipment like blocks, stones or beads, natural displays models, charts, pictures, play materials, games, audio visual equipment (Majid, 2014). Iya, (2015) says that the teacher's work as communicator, model and identification figure can be supported by a wised use of variety of devices that expand experience, clarify it and give it personal significance. Similarly, Majid (2014) viewed instructional materials as didactic materials-things which are supposed to make learning and teaching possible while according to Johnson cited in (Majid, 2014) instructional materials are the collections and selection of resources (mechanical, otherwise) from available resources which are applied and integrated into a systematic process of teaching and learning to make learning effective. (Ikerionwu, 2000a) define instructional materials as objects or devices, which help the teacher to make a lesson more understandable to the learner.

(Ikerionwu, 2000b) defined teaching aids as those materials used for practical and demonstration in the class situation by students and teachers. (Ikerionwu, 2000a) saw instructional materials as objects or devices that assist the teacher to present a lesson to the learners in a logical manner. In his own perspective, (Adesokan, 2022) saw instructional materials as visual and audio-visual aids, concrete or non-concrete, used by teachers to improve the quality of teaching and learning activities in Social Studies(Agina-Obu, 2005) submitted that instructional materials of all kinds appeal to the sense organs during teaching and learning. Isola (2010) also described instructional materials as objects or devices that assist the teachers to present their lessons logically and sequentially to the learners. Oluwagbohunmi and Abdu-Raheem (2014) acknowledged that instructional materials are such used by teachers to aid explanations and make learning of subject matter understandable to students during teaching learning process.

(Doublegist, 2013) define instructional materials to be all the five senses of sight, learning, hearing, touch, smell and taste while presenting his/her lesson and are very important in teaching pre-primary school because they facilitate the direct association between sound and their symbols and also words and the objects they represent. (Aguokogbuo, 2000) define instructional materials are those materials or resources employed by the teacher to make teaching and learning process effective and productive.

According to Obemeata (2009), instructional materials are "those things that promote the effectiveness of instruction during teaching and learning process. The use of teaching materials according to him makes teaching real and concrete and is one of the significant developments in the field of teaching, in this present century. (Doublegist, 2013) on his own view on the use of instructional materials asserts that "it helps the teachers to achieve effectively and makes teaching easy for the learner to understand the lesson very practical and lively. This means that instructional materials enhance effectives teaching and learning. Instructional materials when properly used help to make ideas and concept clear. They can raise learning from verbalization to true understanding and also make learning more vivid. Utilization, in this context, refers to the rate or how often an instructional material in Agricultural Science is put into use or services by Agricultural Science teachers in senior secondary schools. The nature of learning in Agriculture calls for demonstration and practical of which the use of instructional materials is very necessary. In an instructional situation, a teacher of Agricultural Science ought to use tools and other instructional materials to impart knowledge and demonstrate skills to learners.

Salisu, Moses, Gideon and Ibanga (2021) stressed that generally, instructional materials help in making abstract concepts concrete and develop skills in learners. The viability and productivity of educational set up depends to a large extent on the availability of resources (Cirfat, Zymil and Tongjura, 2010). This is because no educational organization no matter the size can function effectively to achieve its set goals and objectives without adequate supply of resources in the form of human and materials. Umeh (2016) opined that resources are very vital tools in education. This is due to the fact that without human and materials resources, educational goals and objectives cannot be achieved.

Statement of the Problem

 The provision of instructional materials for teaching and learning of Agricultural Science has received little attention. Many schools are not able to provide a variety of instructional resources needed for Agricultural Science teaching. Most a times, the available instructional materials in some of these schools are obsolete and as well irrelevant for teaching of Agricultural Science (Yusuf, 2013). More so, in some schools where these instructional materials are available, utilization becomes a problem, due to inability and inadequate time to apply them in teaching, irrelevance to subject matter and many more. In most cases, some teachers fail to utilize instructional materials because they do not know their benefits in promoting teaching and learning, while to others, it is due to laziness, poor attitudes and negligence of the teachers. Also, availability and utilization of these instructional materials are sometimes obstructed by inadequate fund, government attitudes towards teaching and learning, poor supervision of teachers, among others.

It is expected that the findings of this study would help Agricultural Science teachers in choosing an appropriate instructional material capable of relieving students' tension towards the subject thus improving students' academic performance in Agricultural Science. It would motivate Agricultural Science teachers to develop interest towards utilizing suitable teaching materials that will be a possible means towards reducing problems in the teaching and learning of Agricultural Science. Findings of this study will help clarify among the teachers the need for continuous and regular improvisation of suitable instructional materials for teaching and learning of Agricultural Science. Moreover, the results of this study will be of great significance to the Agricultural Science curriculum planners.

**RESEARCH METHODS**

The study was conducted in Gombe State of Nigeria. Gombe state is located between latitude 9030ꞌ and 12030ꞌN and longitude 8045ꞌ and 11045ꞌE of the Greenwich Meridian. Gombe state share boundary with Bauchi state to the west, Borno state to the east, Yobe state to the north and Adamawa and Taraba states to the south (Salisu, Moses, Gideon &; Ibanga, 2021). The study adopted a descriptive survey research design. The population of the study was 406 respondents from the 74 secondary schools in Gombe State. The respondents comprised of 184 agricultural science teachers and 222 school administrators (Principal and two Vice Principals) in secondary schools in Gombe State of Nigeria. The sample size of the study was 196 respondents determined using Krejcie and Morgan (1970) sample size table. The study also employed simple random sampling technique to select 61 secondary school administrators and 135 Agricultural Science Teachers having a total of 196 respondents. Instrument used for data collection was a structured questionnaire titled: Questionnaire on the Effective Utilization of Instructional Materials for Teaching and Learning of Agricultural Science in Senior Secondary Schools (QEUIMTLASSSS). The questionnaire was divided into three parts A, B and C. Each part dealt with the research questions with a total of 62 items. The responses on the questionnaire were designed on 5-point Likert type scale as follows:

Highly Functional (HF)/ Highly Utilized (HU)/ Strongly Agreed (SA) - 5 Points

Functional (F)/ Utilized (U)/ Agreed (A) - 4 Points

Moderately Functional (MF)/Moderately Utilized (MU)/ Undecided (U)- 3 Points

Slightly Functional (SF)/ Slightly Utilized (SU)/ Disagreed (D) - 2 Points

Not Functional (NF)/Not Utilized (NU)/ Strongly Disagreed (SD)-1 Point

The research instrument was subjected to face validation by three experts from the Department of Vocational Education, Modibbo Adama University, Yola, Adamawa State. The instrument was trial test on 6 administrators and 14 Agricultural Science teachers in Senior Secondary Schools in Yola, Adamawa State which was not part of the study area. The data collected were analyzed using Cronbach Alpha and 0.84 reliability index was obtained. Data for the study were collected by the researchers with help of five research assistants who were trained on the objective of the study and method of data collection. Mean statistics was used to answer research questions, while the hypotheses of the study were tested using t-test statistics at 0.05 level of significance. The decision point was 3.0 for all items. All analyses were carried out using Statistical Package for Social Sciences (SPSS) version 26.

**RESULTS AND DISCUSSION**

Research Question 1: What are the level of functionality of instructional materials in teaching and learning of Agricultural Science in Secondary Schools in Gombe State?

Table 1: Mean and Standard Deviation of Administrators and Teachers on the level of Functionality of Instructional Materials in Teaching and Learning of Agricultural Science

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | $n\_{a}$ = 61 | $n\_{t}$ = 135 |
| S/N | Items | $$\overbar{x}\_{a}$$ | $$σ\_{a}$$ | Rmk | $$\overbar{x}\_{t}$$ | $$σ\_{t}$$ | Rmk |
|  | School Farm | 4.02 | 0.22 | F | 3.91 | 0.46 | F |
|  | W a tering Cans | 3.95 | 0.22 | F | 3.90 | 0.41 | F |
|  | Seed Sower | 3.98 | 0.22 | F | 3.95 | 0.24 | F |
|  | Plant Lifters | 3.97 | 0.31 | F | 3.95 | 0.27 | F |
|  | A s s o r t e d Kn a ps a ck Sp r ayer | 3.97 | 0.31 | F | 3.95 | 0.29 | F |
|  | Secateurs | 4.03 | 0.18 | F | 3.95 | 0.37 | F |
|  | Pla n ting Hoes | 4.02 | 0.22 | F | 3.96 | 0.34 | F |
|  | Spade | 4.05 | 0.22 | F | 3.99 | 0.29 | F |
|  | Pick Axe | 3.90 | 0.44 | F | 3.89 | 0.45 | F |
|  | Hand Trowel | 3.93 | 0.25 | F | 3.91 | 0.29 | F |
|  | Head Pns | 4.05 | 0.28 | F | 3.95 | 0.33 | F |
|  | Wheel Barrow | 3.98 | 0.22 | F | 3.92 | 0.41 | F |
|  | Machetes | 3.95 | 0.38 | F | 3.88 | 0.49 | F |
|  | Nursery Trays | 3.93 | 0.25 | F | 3.92 | 0.34 | F |
|  | Rammers and Dibbers | 4.03 | 0.18 | F | 3.97 | 0.33 | F |
|  | Shovels | 3.98 | 0.13 | F | 3.95 | 0.23 | F |
|  | Incubator and Hatcher  | 1.02 | 0.13 | NF | 1.01 | 0.09 | NF |
|  | Egg Candler  | 1.08 | 0.46 | NF | 1.02 | 0.18 | NF |
|  | Vaccinator | 1.08 | 0.46 | NF | 1.02 | 0.26 | NF |
|  | Rabbitry Unit | 1.07 | 0.51 | NF | 1.03 | 0.35 | NF |
|  | Dairy cattle Unit | 1.02 | 0.13 | NF | 1.01 | 0.09 | NF |
|  | Beef Cattle Unit | 1.08 | 0.46 | NF | 1.02 | 0.18 | NF |
|  | Sheep Unit | 1.05 | 0.38 | NF | 1.02 | 0.26 | NF |
|  | Goat Unit | 1.07 | 0.51 | NF | 1.03 | 0.35 | NF |
|  | Piggery | 1.05 | 0.28 | NF | 1.02 | 0.18 | NF |
|  | Laying Unit | 1.05 | 0.38 | NF | 1.02 | 0.26 | NF |

$\overbar{x}\_{t}$= Mean response of Teachers, σt = standard deviation of Teachers, = Mean rating of Administrators, = standard deviation of Administrators, = Number of Teachers, = Number of Administrators, $\overbar{x}\_{a}σ\_{a}n\_{t}$F= Functional$n\_{a}$, NF= Not-Functional

Table 1 showed that the respondents identified the school farm, w a ter i ng c a n s, seed s o w e r, plant lifte r s , a s s o r t e d k n a p s a c k s p r a y e r, s e c a t eur s, pl a n ting h o e s, s p a d e, pick a x e, hand trowel, h e ad pans , wh eel barrow , mac h etes, nursery trays, rammers and dibbers and s hovel s as items that are functional with highest mean value response of 4.05 and 3.90 as the lowest mean value. The corresponding standard deviation ranges between 0.13 and 0.38 respectively. While items such as incubator and hatcher, egg candler, vaccinator, rabbitry unit, dairy cattle unit, beef cattle unit, sheep unit, goat unit, piggery and laying unit were Not-functional with the highest mean value response of 1.07 and the lowest mean value of 1.02. Out of the 26 items listed, the respondents rated only 16 items as functional, while 10 items were not functional instructional materials for teaching and learning of Agricultural Science in Secondary Schools in Gombe State.

Research Question 2: What is the level of utilization of instructional materials for teaching and learning of Agricultural Science in Secondary Schools in Gombe State?

Table 2: Mean and Standard Deviation of Administrators and Teachers on the level of Utilization of Instructional Materials in Teaching and Learning of Agricultural Science

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | $n\_{a}$ = 61 | $n\_{t}$ = 135 |
| S/N | Items | $$\overbar{x}\_{a}$$ | $$σ\_{a}$$ | Rmk | $$\overbar{x}\_{t}$$ | $$σ\_{t}$$ | Rmk |
|  | School Farm | 4.03 | 0.18 | U | 3.99 | 0.15 | U |
|  | W a tering Cans | 3.97 | 0.18 | U | 3.96 | 0.19 | U |
|  | Seed Sower | 3.93 | 0.31 | U | 3.92 | 0.37 | U |
|  | Plant Lifters | 3.95 | 0.22 | U | 3.95 | 0.21 | U |
|  | A s s o r t e d Kn a ps a ck Sp r ayer | 3.97 | 0.31 | U | 3.94 | 0.37 | U |
|  | S ecateurs | 4.92 | 0.42 | U | 4.92 | 0.35 | U |
|  | Pla n ting Hoes | 3.92 | 0.38 | U | 3.98 | 0.30 | U |
|  | Spade | 3.97 | 0.31 | U | 3.92 | 0.41 | U |
|  | Pick Axe | 4.02 | 0.22 | U | 3.98 | 0.26 | U |
|  | Hand Trowel | 4.00 | 0.18 | U | 3.97 | 0.21 | U |
|  | Head Pans | 3.98 | 0.29 | U | 3.96 | 0.26 | U |
|  | Wheel Barrow | 4.02 | 0.13 | U | 3.97 | 0.21 | U |
|  | Matchets | 3.97 | 0.31 | U | 3.95 | 0.29 | U |
|  | Nursery Trays | 3.95 | 0.22 | U | 3.94 | 0.24 | U |
|  | R amm ers and Dibbers | 3.97 | 0.18 | U | 3.95 | 0.23 | U |
|  | Shovels | 4.07 | 0.25 | U | 4.03 | 0.17 | U |
|  | Incub a to r and Hatcher  | 1.07 | 0.25 | NU | 1.03 | 0.17 | NU |
|  | Egg Candler  | 1.13 | 0.50 | NU | 1.06 | 0.35 | NU |
|  | V a ccinator | 1.07 | 0.25 | NU | 1.03 | 0.17 | NU |
|  | Rabbitry Unit | 1.13 | 0.50 | NU | 1.06 | 0.35 | NU |
|  | D a iry ca t tle Unit | 1.20 | 0.75 | NU | 1.09 | 0.52 | NU |
|  | Beef Cattle Unit | 1.07 | 0.25 | NU | 1.03 | 0.17 | NU |
|  | Sheep Unit | 1.07 | 0.25 | NU | 1.03 | 0.17 | NU |
|  | Goat Unit | 1.00 | 0.00 | NU | 1.00 | 0.00 | NU |
|  | Pi g gery | 1.20 | 0.75 | NU | 1.09 | 0.52 | NU |
|  | Laying Unit | 1.26 | 1.00 | NU | 1.12 | 0.69 | NU |

$\overbar{x}\_{t}$= Mean response of Teachers, σt = standard deviation of Teachers, = Mean rating of Administrators, = standard deviation of Administrators, = Number of Teachers, = Number of Administrators, U$\overbar{x}\_{a}σ\_{a}n\_{t}$= Utilized$n\_{a}$, NU= Not Utilized

Table 2 showed that the school farm, watering cans, seed sower, plant lifters, assorted knapsack sprayer, secateurs, planting hoes, spade, pick axe, hand trowel, head pans, wheel barrow, machetes, nursery trays, rammers and dibbers and shovels were utilized for instructional materials for teaching and learning of Agricultural Science in Secondary Schools in Gombe State with the highest mean value response of 4.07 and the lowest mean value of 3.90. The corresponding standard deviation ranges between 0.15 and 0.42 respectively. While items such as incubator and hatcher, egg Candler, vaccinator, rabbitry unit, dairy cattle unit, beef cattle unit, sheep unit, goat unit, piggery and laying unit were not utilized as indicated with the highest mean value response of 1.00 and the lowest mean value of 1.26. Out of the 26 items listed, the respondents identified only 16 items as utilized, while 10 items were not utilized for teaching and learning of Agricultural Science in Secondary Schools in Gombe State.

Research Question 3: What are the factors militating against the effective utilization of instructional materials in teaching and learning of Agricultural Science in Secondary Schools in Gombe State?

Table 3: Mean and Standard Deviation of Administrators and Teachers on the Factors Militating Against the Effective Utilization of Instructional Materials in Teaching and Learning of Agricultural Science

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | $n\_{a}$ = 61 | $n\_{t}$ = 135 |
| S/N | Items | $$\overbar{x}\_{a}$$ | $$σ\_{a}$$ | Rmk | $$\overbar{x}\_{t}$$ | $$σ\_{t}$$ | Rmk |
|  | Lack of technical skills on part of Agricultural science teachers greatly affect the effective utilization of instructional materials in our school | 3.98 | 0.13 | A | 3.96 | 0.19 | A |
|  | Lack of supervision of teachers by the school authority greatly affect the effective utilization of instructional materials in our school | 3.97 | 0.26 | A | 3.95 | 0.24 | A |
|  | Lack of in-service training for serving agricultural science teachers greatly affect the effective utilization of instructional materials in our school  | 4.02 | 0.13 | A | 3.98 | 0.18 | A |
|  | Lack of agriultural science laboratory technicians greatly affect the effective utilization of instructional materials in our school | 3.97 | 0.26 | A | 3.96 | 0.23 | A |
|  | Lack of motivation of agricultural Science teachers greatly affect the effective utilization of instructional materials in our school | 3.95 | 0.38 | A | 3.95 | 0.31 | A |
|  | Short periods allocated to agricultural science classes on the school time-table greatly affect the effective utilization of instructional materials in our school  | 3.98 | 0.13 | A | 3.95 | 0.21 | A |
|  | Embezzlement of funds meant for instructional materials by the school authority greatly affect the effective utilization of instructional materials in our school | 4.00 | 0.18 | A | 3.98 | 0.20 | A |
|  | Large class size greatly affect the effective utilization of instructional materials in our school | 3.97 | 0.18 | A | 3.96 | 0.19 | A |
|  | Lack of funds greatly affect the effective utilization of instruction of instructional materials in our school | 3.97 | 0.18 | A | 3.96 | 0.19 | A |
|  | Poor infrastructure greatly affect the effective utilization of instructional materials in our school | 4.93 | 0.40 | A | 4.92 | 0.41 | A |

$\overbar{x}\_{t}$= Mean response of Teachers, σt = standard deviation of Teachers, = Mean rating of Administrators, = standard deviation of Administrators, = Number of Teachers, $\overbar{x}\_{a}σ\_{a}n\_{t}$ = Number of $n\_{a}$Administrators, A= Agreed

 Table 3 revealed that the respondents agreed that lack of technical skills, lack of supervision of teachers by the school authority, lack of in-service training, lack of agricultural science laboratory technicians, lack of motivation, lack of funds, poor infrastructure and embezzlement of funds meant for instructional materials by the school authority are the factors militating against the effective utilization of instructional materials in teaching and learning of Agricultural Science in Secondary Schools in Gombe State. This was expressed by both the teachers and administrators with mean value which ranges between 3.93 and 4.93 with corresponding standard deviation which ranges between 0.13 and 0.40 respectively.

Hypothesis 1: There is no significant difference between the mean responses of Agricultural Science teachers and administrators on the level of functional instructional materials in teaching and learning of Agricultural Science in Secondary Schools in Gombe State

Table 4: t-Test Analysis of Difference between the Mean Responses of Administrators and Teachers on the Level of Functionality of Instructional Materials in Teaching and Learning of Agricultural Science in Secondary Schools

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Respondents | N | Mean | σ | Df | t | P – value | Remark |
| Administrators | 61 | 2.81 | 0.09 |  |  |  |  |
|  |  |  |  | 194 | 1.89 | 0.060 | Not Significant |
| Teachers | 135 | 2.76 | 0.18 |  |  |  |  |

P >0.05 N= Number of respondents, σ = Standard Deviation

Table 4 revealed that there is no significant difference between the mean responses of Agricultural Science teachers and administrators on the level of functional instructional materials in teaching and learning of Agricultural Science in Secondary Schools in Gombe State, hence, the hypothesis was accepted.

Hypothesis 2: There is no significant difference between the mean responses of Agricultural Science teachers and administrators on the level of utilization of instructional materials for teaching and learning of Agricultural Science in Secondary Schools in Gombe State

Table 5: t-Test Analysis of Difference between the Mean Responses of Administrators and Teachers on the Level of Utilization of Instructional Materials in Teaching and Learning of Agricultural Science in Secondary Schools

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Respondents | N | Mean | σ | Df | t | P – value | Remark |
| Administrators | 61 | 2.82 | 0.11 |  |  |  |  |
|  |  |  |  | 94 | 1.84 | 0.067 | Not Significant |
| Teachers | 135 | 2.78 | 0.12 |  |  |  |  |

 P >0.05 N= Number of respondents, σ = Standard Deviation

Table 5 revealed that there is no significant difference between the mean responses of Agricultural Science teachers and administrators on the level of utilization of instructional materials for teaching and learning of Agricultural Science in Secondary Schools in Gombe State, hence, the hypothesis was accepted.

Hypothesis 3: There is no significant difference between the mean responses of Agricultural Science teachers and administrators on the factors militating against the effective utilization of instructional materials in teaching and learning of Agricultural Science in Secondary Schools in Gombe State.

Table 6: t-Test Analysis of Difference between the Mean Responses of Administrators and Teachers on the Factors Militating against the Effective Utilization of Instructional Materials in Teaching and Learning of Agricultural Science in Secondary Schools

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Respondents | N | Mean | σ | Df | t | P – value | Remark |
| Administrators | 61 | 4.07 | 0.15 |  |  |  |  |
|  |  |  |  | 194 | 0.711 | 0.478 | Not Significant |
| Teachers | 135 | 4.06 | 0.13 |  |  |  |  |

 P >0.05 N= Number of respondents, σ = Standard Deviation

Table 6 revealed that the administrators and teachers had mean values of 4.07 and 4.06 with their corresponding standard deviation of 0.44 and 0.43 at 194 degree of freedom. The P-value of 0.478 which was greater than the significant level of 0.05 implies that there is no significant difference between the mean responses of Agricultural Science teachers and administrators on the factors militating against the effective utilization of instructional materials in teaching and learning of Agricultural Science in Secondary Schools in Gombe State, hence, the hypothesis was accepted.

**Discussion of Findings**

The finding of the study revealed that out of the 26 items listed, only 16 items which include school farm, watering cans, plant lifters, planting hoes, spade, pick axe, hand trowel, head pans, wheel barrow, machetes, nursery trays, rammers and dibbers, and shovels were functional for teaching and learning of Agricultural Science in Secondary Schools in Gombe State. This finding is in agreement with (Comfort & Diseph, 2018) who carried out a study on availability and utilization of instructional materials for the implementation of the new biology curriculum in senior secondary schools in Lagos, Nigeria. Arum reported that the instructional materials used in teaching Biology in secondary schools were not functional and obsolete. The non-functionality of instructional materials is not unconnected with the poor maintenance culture in the secondary schools and these inevitably affect the functionality of the instructional materials. To further buttress the finding, (Achimugu, 2017) and Nwafor and Eze (2014) reported the poor condition of the various instructional materials used in teaching and learning processes. In the Authors different submissions, the state of the instructional materials was at an alarming stage as even some printed materials, models and charts have since loss its aesthetic views, while some text books are very old and outdated. (Faith C. O. Hulda C. O &; Samuel C. U., n.d.) in support of the above asserted that most of the textbooks content are not in tandem with the curriculum and as such new and functional instructional materials be provided for effective teaching and learning in the secondary schools.

The finding of the study revealed that instructional materials such as school farm, watering cans, plant lifters, planting hoes, spade, pick axe, hand trowel, head pans, wheel barrow, machetes, nursery trays, rammers and dibbers, and shovels were highly utilized for teaching and learning of Agricultural Science in Secondary Schools in Gombe State. This finding is in agreement with Nwafor and Eze (2014) who examined the availability and utilization of instructional materials in teaching basic science in selected secondary schools in Abakaliki education zone of Ebonyi state, Nigeria. According to Nwafor and Eze, the available instructional materials were highly utilized by teacher in the education zone which gives birth to high academic performance of students in the eternal examination. Furthermore, Turba (2015) who surveyed the availability and use of instructional materials for art teaching in four colleges of education in Kaduna and Plateau states, Nigeria reported a high utilization of instructional materials by teacher in the colleges. However, contradicting the finding, (Chukwudum et al., 2022) reported that teachers do not like to use instructional materials as some teachers considered it as a waste of time due to the duration of time allocated to the subject in the school time table.

The finding of the study revealed that factors militating against the effective utilization of instructional materials in teaching and learning of Agricultural Science in Secondary Schools in Gombe State include lack of motivation, technical skills and in-service training for teachers, poor supervision of teachers by the school authority, lack of agricultural science laboratory technicians, short periods allocated to agricultural science classes and embezzlement of funds. This finding is in agreement with Suleiman (2014) who reported the use of instructional materials is hindered by a number of factors which include unavailability of instructional materials in schools, poor technical knowhow (knowledge) of the instructional materials and poor use of the instructional materials by teachers. The report by Okoji (2013) revealed that certain factors which barred the teachers from effective utilization of instructional materials include poor knowledge of the learning materials to be used and when to use it. The poor and unfriendly environment which the teacher is expected to use the instructional materials constitute another barrier to the effective utilization of instructional materials. The finding contradicts the report of (Ashioya, 2012) who reported that the teacher would not utilize the instructional materials even if they are exposed to variety of the materials as they are not willing to utilize the instructional materials available.

The finding of the study revealed that there is no significant difference between the mean responses of Agricultural Science teachers and administrators on the level of functional instructional materials in teaching and learning of Agricultural Science in Secondary Schools in Gombe State. This finding is in agreement with Usman (2016) who in the report on the availability and used of instructional materials by secondary school economics teachers in Kwara State, reported that teachers and students were unanimous in their opinion on the functionality of instructional materials for teaching economics in Kwara state. To further supporting the finding, (Comfort & Diseph, 2018) revealed that the teacher both male and female agreed that most of the instructional materials were functional as it patterns the teaching and learning of the new biology curriculum in senior secondary schools in Lagos, Nigeria.

The finding of the study revealed that there is no significant difference between the mean responses of Agricultural Science teachers and administrators on the level of utilization of instructional materials for teaching and learning of Agricultural Science in Secondary Schools in Gombe State. This finding is in agreement with Nwafor and Eze (2014) reported that no significant difference exists between teachers, laboratory attendants and students on the utilization of instructional materials in teaching basic science in selected secondary schools in Abakaliki education zone of Ebonyi state. A no significant difference between teachers and students on the utilization of instructional materials was also reported by Nwafor and Eze (2014).

The finding of the study revealed that there is no significant difference between the mean responses of Agricultural Science teachers and administrators on the factors militating against the effective utilization of instructional materials in teaching and learning of Agricultural Science in Secondary Schools in Gombe State. This finding is in agreement with Usman (2016) who reported that both economic male and female teachers indicated a no significant difference on the factors affecting the proper utilization of instructional materials by secondary school Economics teachers in Kwara State, Nigeria. Turba (2015) supported the finding by asserting that when an issue is of a common interest, the people involved will always have the same view and opinion and as such there was no significant difference between teachers in Kaduna and Plateau states on the factors hindering the effective use of instructional materials for art teaching in colleges of education in, Nigeria.

**CONCLUSION**

Based on the findings of the study, it was concluded that instructional materials such as school farm, watering cans, plant lifters, planting hoes, spade, pick axe, hand trowel, head pans, wheel barrow, machetes, nursery trays, rammers and dibbers, and shovels were highly utilized for teaching and learning of Agricultural Science in Secondary Schools in Gombe State. There is no significant difference between the mean responses of Agricultural Science teachers and administrators on the level of functionality, utilization and factors militating against the effective utilization of instructional materials in teaching and learning of Agricultural Science in Secondary Schools in Gombe State.

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