# SELF INSTRUCTIONAL PACKAGE FOR PROMOTING QUALITY AGRICULTURAL SKILLS ACQUISITION AMONG SENIOR SECONDARY SCHOOL STUDENTS IN ENUGU STATE.

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## Abstract

*This study was designed to determine the effect of Self Instructional Package (SIP) on students" academic achievement and interest in agricultural science in Senior Secondary Schools. Two specific purposes, research questions and related null hypotheses were formulated for this study. The pre-test, post test, non – equivalent control group, quasi experimental design which involved groups of students in their intact classes assigned to experimental and control groups was adopted for the study. The population for the study was 6,014 Senior Secondary One (SS1) students in Nsukka Education Zone of Enugu State, out of which 378 students were sampled using purposive sampling technique. The instruments used for data collection were Agricultural Science Achievement Test (ASAT) and Agricultural Science Interest Inventory (ASII). To ensure content validity of the ASAT, a table of specification was developed for the test. The lesson plans, ASAT and ASII were subjected to face and content validation by five experts. The ASAT and ASII were trial tested on 20 SS1 students to determine their reliability. The trial test for determining coefficient of stability of the ASAT was carried out using test re-test reliability method. Pearson product moment correlation coefficient of the ASAT was found to be 0.80, while the agricultural science interest inventory was also trial tested and a reliability coefficient of 0.76 was obtained, meaning that the instrument was reliable. The ASAT and ASII were administered to the subjects before and after the treatment. Data generated were analyzed using mean to answer the research questions, while Analysis of Covariance was used to test the null hypotheses. The findings of the study revealed that self instructional package is more effective in improving students" achievement and interest in Agricultural science than conventional lecture method. Based on the findings and discussion of the findings, it is concluded that self instructional package has a more positive effects on academic achievement than conventional lecture. It was also found that self instructional package stimulates and retains interest in agricultural science among senior secondary school students. It was recommended that: Teachers should be trained by proprietors, ministry of education and education based nongovernmental organizations on the utilization of self instructional package and other individualized and interactive methods of teaching; while Curriculum planners should integrate self instructional package as instructional delivery method in the curriculum of secondary schools.*

***Key Words:*** *Self Instructional Package, Agricultural Skills Acquisition, Academic Achievement, Conventional Teaching Methods*

## Introduction

Agricultural science is one of the subjects taught at different levels in the Nigeria school system including secondary school. Secondary school is the third level of formal education, and comes after Pre – Primary and Primary School levels. According to Federal Government of Nigeria (FGN) (2013), secondary school education is the education offered to children aged 11 to 15 years plus and is divided into junior secondary (upper basic) and senior secondary (post basic) levels. The senior secondary level comes after the successful completion of ten years of basic education and passing the Basic Education Certificate Examination (BECE). Education at this level is designed to provide holders of the basic

education certificate with opportunity for education at a higher level; provide trained manpower in the applied sciences, technology and commerce at sub professional levels; and impart entrepreneurial, technical and vocational job – specific skills for self reliance; and for agricultural, industrial, commercial and economic development. The level of proficiency and skill acquired at the end of the senior secondary school is indicated by the grade obtained by the student in a single examination administered by regional examination body - the West African Examination Council (WAEC) and national examination bodies such as National Examination Council (NECO) and the National Business and Technical Education Board (NABTEB). Such grades represent students' achievement in various subjects including agricultural science.

Achievement literally means one's level of accomplishment or attainment after some level of efforts. Achievement according to Akale (2001) is the level of knowledge, skills or ascertained using the students' scores on achievement tests in agriculture.

The level of achievement is a function of several factors which function collectively and interactively to influence the academic achievement of students in any given subject. According to Nasreen and Naz (2013), factors such as personal confidence and a feeling of competence in learning, hopeful but realistic projection into the future, occupational roles and social roles, emotional stability, interpersonal tendency towards introversion, and a tacit acceptance of the curricula and work demands arising from it, parental involvement and support, peer pressure, teacher's teacher style, socio – economic status produce significant influence on the academic achievement of students. Of these factors, the teachers teaching style and method has over the years exerted enormous influence in stimulating and retaining interest and achievement in a subject (Obi, 2006; Olaitan in Ofoha, 2007; and Ibitoye, 2007).



accomplishment in an area of endeavor especially by making an effort for a period of time. While Anaekwe (2006) conceived achievement as something which has been carried out successfully especially by means of exertion, skill, practice or perseverance, Aenker in Ezea (2007), view it as a change in behavior at the end of a given period of time or within a given time range. Academic achievement therefore connotes the level of knowledge or skills attained in school subject which is ascertained through the scores on achievement tests. Students' achievement is defined as the level of knowledge attained or acquired by the students in agricultural science, which are

Teachers teaching style otherwise referred to as teaching method and technique have been defined by Gagne in Nwokorie and Akpata (2004) as consisting of recurrent instructional process applicable to various types of subject matter and usable by more than one teacher. It is a set of pattern of interaction between the teacher and the students or students and teaching activities intended to lead to the achievement of predetermined educational objectives. Teaching methods can generally be classified into the conventional lecture (teacher centered) and student centered methods. According to Gbamaja (2001), the conventional

lecture approach of teaching is the —talk and chalk‖ or —textbook method‖. Where the teacher dominates the teaching with very little participation on the part of the learners. The teacher is seen as the repository of all knowledge while the students are passive recipients of knowledge transmitted by the teacher in the process of learning (Agwagah, 2003 & Jalejaiye, 2001). According to Adah and Ameh, (2002); Nwosu (2001) and Musa (2007), the conventional lecture approach of instruction is predominantly used by teachers and encourages memorization and regurgitation of facts and concepts without carrying out the activities on which these facts and concepts are based; are mostly teacher centered and as a result students adopt rote learning, making this approach ineffective in learning difficult manipulative tasks involving acquisition of work related skills.

The Student centered methods shifts attention from the teacher to the learner and provide opportunities for the learner to take charge of the teaching learning process, hence they are variously described as individualized instruction, self regulated instruction, and child centered learning among others, and involves tailoring instruction to the particular needs and ability of each learner, making the learner work at his or her own pace. Individualized instruction, according to Chauhan (2004), is that in which the teacher attends to the learning needs and problems of each learner separately, tailoring instruction to the particular needs and ability of each learner. Montague (2008) noted that self-regulation strategies like self-instruction, self-questioning, self-evaluation, self-monitoring and self-reinforcement, help learners in gaining access to cognitive processes that facilitate learning, guide learners as they apply the processes within and across domains, and regulate their application and overall performance task. The teacher acts more as a facilitator to the students learning and not as the prime provider of instruction or knowledge.

The need to actively involve students in the teaching learning process has necessitated the clamor for the adoption of more participatory and student centered teaching approaches such as Self Instructional Package (SIP). Self Instructional Package is an innovative approach that acts as a vehicle for individualization of learning. It is an adaptation of the programming of instruction to the particular needs of the student. According to Smith (2007), a self instructional Package is a form of communication between the student and the package that contains instructions for student activities leading toward specified achievement. It is a teacher-developed strategy of instruction, and is basically a booklet on a given topic containing objectives related to the topic, diverse activities to reach these objectives, and evaluations to determine if the objectives have been met. Offorma & Ofoefuna (2001) and Romisowski in Abu (2001) described SIP as a booklet containing sets of learning assignments organized sequentially to achieve the specified objectives. The package contains diverse activities to reach the objectives and evaluation techniques to determine whether the objectives have been achieved or not. According to Smith (2007); Wandesee (2001) and Chauhan (2004), SIP has obvious advantages which include breaking materials into small units; making instruction more student centered; stimulate students‘ interest in the lessons through active participation; permits time for students to assimilate and accommodate information and builds self-confidence in students. Furthermore, it enables the students to tackle and solve problems in their learning

experiences thus stimulating and sustaining interest in the teaching learning process.

Literally, interest is an expression or show of likeness or dislike towards a particular situation, condition, circumstance, object, something or somebody.

According to Ezema (2002), interest is an individual's reaction, feelings and impressions about something and its related tasks or situation. According to Okoro (2006), it is an act of showing favorable curiosity or concern about something. Worker in Ofoha (2007) defined interest as a social construction developing within the dynamic relationship between the individual and the situation. Students' interest in learning is associated with their anxiety to learn and a strong desire for knowledge or quality that arouses concern, curiosity or power to hold students' attention. Students' interest in agricultural science entails a show of likeness or dislike towards the study of the subject demonstrated through responses on an interest inventory. Interest may be in the positive or negative form. Abonyi (2005) explained that when interest is in the positive form, it leads to likeness and curiosity to the learning task while negative interest leads to hatred to the learning task or subject matter as expressed by increased rate of truancy, rate of school dropout and poor academic achievement. Nwangwu in Ofoha (2007) noted that positive interest correlates positively with high performance in school subject while negative interest correlates with low performance, whereas high performance in a subject could stimulate positive interest while low performance produces hatred to learning task.

The persistent poor academic achievement in agricultural science in Nigeria and Enugu State in particular as reflected in the performance of students in prescribed examinations like Senior Secondary School Certificate Examination (SSSCE) of both West African Examination Council (WAEC) and National Examination Council (NECO) in Agricultural Science between 2008 and 2014 has become a thing of worry to stakeholders, including parents, teachers, educational psychologists, counselors, Government and the society at large (Aburime,2009). For agriculture, this becomes more worrisome when one considers the critical role it plays in terms of poverty reduction, food security, income generation, employment creation, and a major source of foreign exchange earnings, and thus, the bedrock for national economic development.

As a way of stimulating interest and promoting academic achievement, many programs such as the introduction of new textbooks and workbooks, conferences and seminars for teachers, in-service trainings, extramural classes among have been introduced, without yielding any commensurate result because these interventions do not lead to active engagement of the learner. Most authors including Aburime (2009) and Oyedeji (1998) have called for an overwhelming need for a review of current teaching and learning strategies as conventional teaching method which is teacher-centered and does not actively involve the students in the learning and problem-solving processes as they are predominantly passive. The inability of students to engage actively in the learning process tends to dispose the students to constant rote learning and examination malpractice leading to their poor academic performance. Lack of students _exposition to meta cognitive strategies creates their difficulty to explain their learning process.

This ultimately results in their resorting to rote and blind memorization of concepts to pass examination. Agricultural science involves the acquisition of work place skills to guarantee sustainable employment. This can be achieved by enhancing technical skills and competences; and life skills such as problem solving and analytical skills, effective communication and literacy skills, interpersonal and intra – personal skills, which are required for profitable engagement in the 21st century workplace. There is therefore the need to shift emphasis to cognitive and metacognitive strategies like self-instructional learning package to facilitate student interaction with leaning environment ant take active part in their own learning. This study was therefore designed to determine the effects of SIP on students' academic achievement and interest in agricultural science. Specifically, the study was designed to determine;

1. The mean achievement scores of students taught agricultural science using SIP and those taught with conventional lecture approach.
2. The mean interest scores of students taught agricultural science using SIP and those taught with conventional lecture approach

## Research Questions

1. What are the mean achievement scores of students taught agricultural science with self instructional package and conventional lecture approach?
2. What are the mean interest scores of students' taught agricultural science with SIP and conventional teaching approaches?

## Research Hypotheses

1. There is no significant difference in the mean achievement scores of students taught agricultural science with self instructional package and conventional lecture approach.
2. There is no significant difference in the mean interest scores of students' taught agricultural science with SIP and conventional lecture approach.

## Methodology

The Quasi-Experimental Design using a pre-test, post-test non equivalent control group was adopted for the study. Quasi-experimental design is where randomization of subject of experimental and control groups are not possible (Nworgu, 2006). Intact classes were randomly assigned to treatment and control groups. This was necessary in order not to disrupt the normal classes of the students and the school time table. The study was conducted in Nsukka Education Zone of Enugu State, Nigeria. The population for the study comprised, 6014 Senior Secondary School, Class one (SS1) students from 58 public Secondary Schools in the three Local Government Areas in Nsukka Education Zone, who offered agricultural science in 2015/2016 academic session. The sample for the study consists of six schools purposively sampled from the three local government areas in Nsukka Education Zone on the basis of having SS1 class and accessibility, and 378 SS1 Agricultural science students from the six schools, comprising 168 male and 210 female students in the sampled schools. These were divided into the experimental group (taught with SIP) and the control group (taught with conventional lecture method). A Self Instructional Package (SIP) was developed in conjunction with the teachers and used for the experimental group. The SIP contained a detailed description of the Topic and Sub- topic, Instructional Objectives, Content, Instructional Strategies, Instructional Materials, and evaluation to guide the students through the learning process.

The instruments used for data collection were the Agricultural Science Achievement Test (ASAT) and Agricultural Science Interest Inventory (ASII) developed by the researcher. ASAT and ASII were subjected to both face and content validations. The ASAT was trial tested on 20 SS1 students in Opi High school which was not part of the study, to ascertain the reliability of the instrument. Test retest method was used in checking the reliability of the instrument. The answer sheets were marked by the researcher and the scores obtained from the first and second administration of tests correlated using Pearson's Product Moment Correlation coefficient which yielded a reliability coefficient of 0.80. The Kuder Richardson formula 20 (K-R20) was used to establish the stability over time of the instrument at 0.84 meaning that the instrument is reliable. The interest inventory was also trial tested and a reliability coefficient computed for ASII was found to be 0.76, meaning that the instrument was reliable.

The ASAT and ASII were administered to the subjects before and after the treatment. The scores for both the experimental and control group were recorded accordingly. The test item in both Pre-test and Post-test were scored one mark each. The maximum mark is 30 while the lowest mark is zero (0). The data generated was analyzed using mean for the research questions while the Hypotheses were tested using Analysis of Co-variance (ANCOVA) at 0.05 level of significance. The use of ANCOVA was to control the errors of initial non-equivalence arising from the use of intact classes as subjects of the study. If the Mean gain difference is positive, it has a favorable effect and if it is negative, it has an adverse effect. However, the null hypothesis was upheld when the significant value was greater than 0.05 (P > 0.05) and rejected when otherwise.

## Result and Findings

**Table 1**: **Mean of Pretest and Posttest Achievement Scores of Students Taught Agricultural Science with Self-instructional Package and Conventional Lecture method.**

| | | Pretest | Posttest | |
|---|---|---|---|---|
| Teaching Method | N | | | Mean Gain |
| Self-Instructional Package | 188 | 9.89 | 15.27 | 5.38 |
| Conventional Method | 189 | 9.65 | 11.85 | 2.20 |

**Research Question 1:** What are the mean achievement scores of students taught agricultural science with self instructional package and conventional lecture method?

Results in Table 1 show that the experimental group taught Agricultural Science using Self-instructional package had a pretest mean score of 9.89 and a posttest mean score of 15.27. The difference between the pretest and posttest Mean for the experimental method was 5.38. The control group taught Agricultural Science using conventional lecture method had a pretest means score of 9.65 and a posttest mean score of 11.85. The difference between the pretest and posttest mean for control group was 2.20. However, for each of the groups, the posttest mean scores were greater than the pretest means with the experimental group taught using self-instructional package having

the higher mean gain and the higher mean in the posttest. This is an indication that self-instructional package had a more positive effect on students' achievement.

**Hypothesis 1:** There is no significant difference in the mean achievement scores of students taught agricultural science with self instructional package and conventional lecture approaches.

**Table 2: Analysis of Covariance (ANCOVA) of the Significant Difference in the Mean Achievement Scores of Students Taught Crop Production with Self-instructional Package and Conventional Lecture method**.

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 1614.347[a] | 2 | 807.174 | 41.647 | .000 |
| Intercept | 3515.403 | 1 | 3515.403 | 181.379 | .000 |
| PretestAch | 512.340 | 1 | 512.340 | 26.435 | .000 |
| Group | 1044.619 | 1 | 1044.619 | 53.898 | .000 |
| Error | 7248.676 | 374 | 19.381 | | |
| Total | 78153.000 | 377 | | | |
| Corrected Total | 8863.024 | 376 | | | |

The result in Table 2 shows that with respect to mean achievement scores of students taught crop production with Self-Instructional Package (SIP) and conventional lecture approach, an F-ratio of 53.89 was obtained with associated exact probability value of 0.00. Thus, there was a significant difference in the mean achievement scores of students taught Agricultural Science with Self-Instructional Package and conventional lecture approach in favour of students taught using self instructional package.

**Table 3**: **Mean analysis of Pretest and Posttest Interest ratings of Students Taught agricultural science with Self-instructional Package and Conventional Lecture method.**

| Teaching Method | N | Pretest | Posttest | Mean Gain |
|---|---|---|---|---|
| Self-instructional Package | 188 | 62.89 | 70.44 | 7.55 |
| Conventional Approach | 189 | 61.34 | 67.07 | 5.73 |

Since the associated exact probability value (0.00) was less than 0.05 set as bench mark, the null hypothesis ($H_{01}$) which stated that there is no significant difference in the mean achievement scores of students taught crop production with selfinstructional package and conventional lecture approach was rejected.

**Research Question 2:** What are the mean interest scores of students taught crop production with selfinstructional package and conventional lecture approach?

Results in Table 3 show that the experimental group taught agricultural science using Self-instructional package had a pretest interest mean rating of 62.89 and a posttest mean rating of 70.44. The difference between the pretest and posttest interest mean rating for the experimental group was 7.55. The control group taught agricultural science using conventional lecture method had a pretest interest mean rating of 61.34 and a posttest mean rating of 67.07. The difference between the pretest and posttest interest mean for control group was 5.73. However, the posttest interest mean ratings for both groups were greater than the pretest means with the experimental group taught using self-instructional package having the higher mean gain and the higher interest mean in the posttest. This is an indication that self-instructional package had a more positive effect on students' interest than the lecture approach.

**Hypothesis 2** There is no significant difference in the mean interest scores of students taught agricultural science with self-instructional package and conventional lecture method

**Table 4: Analysis of Covariance (ANCOVA) of the Significant Difference in the Mean Interest Scores of Students Taught Agricultural Science with Self-instructional Package and Conventional Lecture method.**

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 2421.955[a] | 2 | 1210.977 | 12.561 | .000 |
| Intercept | 37403.173 | 1 | 37403.173 | 387.967 | .000 |
| PretestInt | 1356.589 | 1 | 1356.589 | 14.071 | .000 |
| Group | 695.899 | 1 | 695.899 | 7.218 | .001 |
| Error | 36056.608 | 374 | 96.408 | | |
| Total | 1820427.000 | 377 | | | |
| Corrected Total | 38478.562 | 376 | | | |

The result in Table 4 shows that with respect to mean interest ratings of students taught Agricultural science with self-instructional package (SIP) and conventional lecture approaches, an F-ratio of 7.21 was obtained with associated probability value of 0.01. Since the associated probability value (0.01) was less than 0.05 set as bench mark, the null hypothesis of no significant difference in the mean interest ratings of students taught animal science with self-instructional package and conventional lecture approach was rejected. Thus, there was a significant difference in the mean interest scores of students taught agricultural science with self-instructional package and conventional lecture method in favor of students taught using self-instructional package.

## Discussion of Findings

### Self Instructional Package and Students' Achievement

The findings revealed that the mean score of students taught agricultural science with selfinstructional package was higher than those taught with conventional lecture method. A covariate analysis of the mean achievement scores of the two groups revealed significant difference in favor of those taught with self instructional package. The implication of this is that the use of self-instructional package is more effective in improving students' achievement. This finding is in consonance with the findings of Ezea (2007) who in his study on effect of fieldwork on students' achievement and interest in map reading in senior secondary school geography, reported that the use of fieldwork teaching had significant effect on students' mean achievement. Also Lona (2002) in his work on the effect of enquiry based instructional method on students' achievement in learning some selected Physics concepts reported that the mean scores of the experimental group on the post test were significantly higher than the mean scores of the control group. These approaches like SIP provide opportunity for students to actively participate in the teaching – learning process. The author therefore advised that interactive, participatory and innovative teaching strategies as used in the experimental group such as self instructional package which will improve students' achievement should be adopted.

**Students' Interest in Agriculture** The finding revealed that students taught agricultural science with Self Instructional Package had higher interest mean gain than the students taught with conventional lecture method. The analysis revealed a significant difference. This showed that selfinstructional package resulted in an increase in students' interest than the conventional lecture method. This finding is in line with Udofia (2004), who reported in his work on effects of edutainment on academic achievement and interest of students in Introductory technology, that experimental group students who were taught with the edutainment instructional techniques were found to have higher scores than the control group who were taught with the conventional discussion method in the interest inventory test. Harbour-Peters (2002) stated that interest comes out as a result of eagerness or curiosity to learn and not by force. This implies that a child develop interest if a particular stimulus is attractive and arousing

or stimulating. The author argued that the use of self-instructional package will definitely boost students' interest in Agricultural science.

## Conclusion and Recommendations

Based on the findings and discussion of the findings, it is concluded that self instructional package has a more positive effects on academic achievement than conventional lecture, stimulates and retains interest in agricultural science among senior secondary school students. On the basis of the conclusion, it was recommended that:

1. Teachers should be trained by proprietors, ministry of education and education based nongovernmental organizations on the utilization of self instructional package and other individualized and interactive methods of teaching;
2. Curriculum planners such as the Nigerian Education Research and development council (NERDC), National Board for Technical Education (NBTE), the National Commission for Colleges of Education (NCCE), the Nigerian Universities Commission (NUC) and other stakeholders should integrate self instructional package as instructional delivery method in the curriculum of secondary schools.

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