INFLUENCE OF GENDER AND SCHOOL TYPES IN PROMOTING STUDENTS' INTEREST IN AGRICULTURAL SCIENCE IN SECONDARY SCHOOLS, IN ENUGU STATE, NIGERIA USING SELF-INSTRUCTIONAL PACKAGE

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Abstract

This study determined the effect of self-instructional package on students' interest in agricultural science in Senior Secondary Schools. The study adopted quasi experimental design which involved groups of students in their intact classes assigned to experimental and control groups. The population for the study was 6,014 senior secondary one students in Nsukka Education Zone of Enugu State out of which 376 students were sampled using a purposive sampling technique. The instrument used for data collection was Interest Inventory Scale (IIS), which was subjected to face validation by five experts. Interest Inventory reliability index of 0.76 was obtained using Cronbach's alpha. Data were analyzed using mean to answer the research questions, while Analysis of Covariance was used to test the null hypotheses. The finding of the study showed that self-instructional package is more effective in promoting students' interest in Agricultural science than a conventional teaching approach in both gender and school type. The study also found out that there was a significant difference among school types in favour of coeducational schools and gender in favour of boys, but the effect on interest was not significant at 0.05 level. Consequently, it was recommended that curriculum planners should include self-instructional package in the school curriculum. The policies that enforce academic standards and discipline should be implemented by the School Administrators in all school types for the improvement of students' interest in Agricultural science in Enugu state.

Keywords: Interest, Self-Instructional Package, Crop Production, Agricultural Science

Introduction

Agricultural science can be broadly understood according to Noll (2015) as the application of scientific methods and methodologies to improve agricultural practices, including the harvesting, processing, and distribution of food, fiber, and pharmaceutical products. It involves training of people to teach, conduct research or provide information to advance the field of agriculture and food science. Agricultural Science is taught at the senior secondary school level with some objectives to achieve. One of the objectives of teaching Agricultural Science at senior school level is to stimulate and sustain students' interest in agriculture;

Different authors define interest in different ways. Hornby (2020) defined interest as an activity or subject that a person enjoys and spends free time doing or studying. Webster, (2018) explains interest as the feeling of one whose attention, concern or curiosity is particularly engaged by something. That is something that involves concern and draws attention or arouses the curiosity of a person. Also, Hornby (2020) defined interest as an activity or subject that a person enjoys and spends free time doing or studying. However, many agriculturists and educationists have observed that many students show negative interest in agricultural science and other vocational subjects especially among the female students. According to Eze (2016) male students exhibit more positive interest in some school subjects than their female counterparts and this explains the reason for the higher academic achievement of the males over the female students. Anigbogu (2018) observed that most female students develop negative interest towards technical and vocational subjects in schools with the mind that such subjects are tasking. For instance, subjects like agricultural science involve students undergoing some practical works in the school farm and laboratories, the females therefore try to avoid offering such subject. The above author also pointed out that some cultures see males as superior to females and that such feelings are manifested in every aspect of the females' lives such as socially, academically and even religiously. This belief has sunk deep into the consciousness of the females and affects their interest in some school subjects. In the same vein, Obioma in Ezebuiro (2017) maintained that male students exhibit more interest in technical and vocational subjects more than the females as the females see subjects like agricultural science as energy demanding and therefore predominantly for the males.

The location of school also effects on the level of students' interest in a school subject. According to Levon (2017) though students' interest in education have direct relations with their natural inclination which is based on subjective feeling of liking or disliking a given subject, yet school location plays a major role in directing such interests as environmental factors shape certain interest. He stressed that with the slow adoption of modern technologies by farmers, students' interest in agricultural science has been on the decline especially at the urban areas. Agricultural science as a school subject is devalued more in the urban schools than in the rural schools. The urban school students due to unavailability of enough lands for school farms see agricultural sciences as a subject mainly for the students in the rural schools where there are enough lands and therefore show negative interest towards the subject. The situation is made worse with some undesirable connotations given to agricultural science in the urban schools as agricultural science is viewed as a soiling and agricultural activities are used as punishment for erring students. Moreover, children who attend rural schools are considered as children of the rural peasant farmers whose parents' interest in agriculture have been transferred to and therefore should be interested in agricultural science in schools having practiced it right from their homes. The truth in this belief is that rural school children do have more agricultural experiences than the urban school students as they are exposed to agricultural activities in the school farm and are also nearer to areas where agricultural activities are practiced more.

However, Fritz (2019) argued that the provision of Information and Communication Technology (ICT) integrated agricultural education which is practiced in the urban schools adds value to urban school agriculture and therefore sustains the students' interest in agricultural science more than that of the rural school students. The inability of the rural school students to have access to information on modern technologies and apply the knowledge which leads to increased agricultural production could dampen the interest of such students in agricultural science as a subject. Georgewill and Tella (2016) in their own views argued that school location contributes either positively or negatively towards the direction of the students' interest in school subjects. They maintained that each area (rural or urban) with more performance enhancing indices attracts students' interests more than the area with less performance enhancing indices.

Hence, interest in agricultural science is relevant when considering the development of effective learning strategies for agricultural science. In contrast, anxiety about learning agricultural science can act as a barrier to effective learning. Students who feel anxious about their ability to cope in agricultural science learning situations may avoid them and thus lose important career and life opportunities. Godpower, Echie and Ihenko (2017) opined that agricultural science teachers should try to identify a teaching approach that can motivate or arouse students' interest.

There are many approaches that a teacher may use in lesson delivery. According to Olaitan in Ezebuiro (2017) these approaches are lecture, demonstration, discussion, problem solving, explanation and expository approaches. These approaches used in the teaching of Agricultural Science in order to bring about a meaningful learning are teacher centered approaches, as the teacher does more of the talking and activities involved in the teaching and learning processes. According to Ogbonna in Ezebuiro (2017) curricular activity in the lecture approach relies heavily on textbooks and workbooks. Students are viewed as "blank slates" unto which information is entrenched by the teacher. In this setting, the teacher seeks the correct answer to validate students' learning rather than assessing processes involved in the learning activities. This approach had failed to recognize the unique features of the inquiry-based nature of vocational subjects and the learners' individuality, thus failed to encourage creative thinking in the learners leading to poor interest of the subject. This calls individualized teaching and learning approach of which Self Instructional Package is the remedy

Self-Instructional Package is a student-centered Activity, an oriented teaching strategy where the teacher acts as a facilitator of learning guiding the students through series of activities and problem solving for greater achievement, (Abu, in Ezebuito (2017). In SIP, learning materials are broken into small steps that are arranged sequentially from known to the unknown and in an increasing order of difficulty. Abu further noted that each student is expected to work at his own pace, thus accommodating both the fast and slow learners

The SIP consists of the following components: Topic and subtopic, Instructional objectives, Content, Instructional strategies, Instructional materials, Evaluation, Pretest and Post-test. The activities in which learners can acquire experience in agriculture could be in area of (1) crop production such as land preparation, tillage, planting, post-planting and post harvesting operations (2) animal production such as cattle, poultry, goat, sheep, rabbit and pig rearing and (3) agricultural engineering such as surveying, irrigation, farm

machinery and farm power or any other branch of agriculture. This study focuses on crop production with special reference to cassava, maize and orange. Crop production is used as a result of its activities or practical skill orientedness and as one of the topics in the scheme of work in senior secondary school class one (SS1). One of the related factors that is confronting the use of learner centered approaches of learning is its ability to have same impact on both male and female students equally. It is worthy of note that opinions and findings about the issue on gender have been diverse. According to Okoro in ezebuiro (2017) disparities usually exist in the levels of interest between male and female students in vocational education.

Gender is seen as a learned socially constructed conditions ascribed to males and females (Offorma in Ezebuiro, 2017). Expectations from males and females are dependent on their cultural milieus. Offorma further remarked that the type of training and exposure given to males and females were dependent on people's understanding and beliefs on the influence of gender. Gender in relation to interest has been an issue of concern to researchers in education. The effect of gender on students' interest in agricultural science has been particularly an area of focus by researchers.

The issues of gender become pertinent in this present study because the schools in the study area are made up of either males or females; hence, the need to see what effect gender has on students' achievement in Agricultural Science using Self Instructional Package. Again, in this study, some secondary schools admit single sex female students (all female), single sex male students (all males) or both in form of co-educational school (both males and females). It is therefore, pertinent to determine the effect of school type on the students' interest using Self Instructional Package. Also, in this study, many secondary schools are located in both the urban and rural areas and may have effect on students' interest when interacted with SIP. Urban area is characterized by good and accessible roads, good drinkable water, health care centres, steady power supply, good schools and churches, while rural area is made up of poor and inadequate social amenities. There is therefore, the need to see what effect the school location in combination with SIP has on agricultural science interest hence, the need for location variable in the study.

Self-Instructional Package will provide opportunity for students to carry out activities by themselves, permit time to accommodate and assimilate information, present learning materials step by step in an increasing order of difficulties and opportunity for self-pace learning. It is against this background that the study is set to determine the influence of gender and school types in promoting students interests in agricultural science in Enugu State using Self Instructional Package. Specifically, the study is set to determine:

1. the effect of gender on students' interest taught crop production using SIP and conventional teaching approaches

2. the effect of school type on students' interest taught crop production with SIP and conventional teaching approaches

Research Questions

The following research questions guided the study

1 What is the effect of gender on students' interest taught crop production using SIP and conventional teaching

2 What is the effect of school type on students' interest taught crop production with SIP and conventional teaching approaches?

Hypotheses

The following hypotheses were formulated and tested at.05 level of significance:

1: There is no significant mean difference between the effect of gender (male and female) on students' interest in crop production.

2: There is no significant mean difference effect among the school type (single sex male, single sex female, coeducational) on students' interest in crop production.

Methodology

This study which was conducted in Nsukka Education Zone of Enugu State, adopted the Quasi-Experimental research design of a pre-test, post-test non-equivalent control group. According to Nworgu in Ezebuiro (2017), Quasi-experimental design is one in which there is no randomization of subjects in experimental and control groups. The researcher randomly assigned intact classes 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 population for the study comprised, 6014 Senior Secondary School, Class one (SS1) students from 58 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 selected from the three local government areas in Nsukka Education Zone. The instrument used for data collection was the

Interest Inventory Test (IIT) which was face validated by five expert – four experts from the Faculty of vocational and Technical Education and one from science education department. The validators were requested to: Check for suitability and clarity of the items and add any other items which were relevant but had not been included in the instrument; remove ambiguous or irrelevant statements in order to improve the structure of the items.

The interest inventory test was also trial tested using the same group of 20 students from Opi High School to ascertain the interest rate of the students. The IIT was scored based on a four-point scale. The internal consistency of the IIT was determined using Cronbach Alpha method. The reliability coefficient computed for IIT was found to be 0.76, meaning that the instrument is reliable. The Interest Inventory Test were administered to the subjects before the treatment and the scores were kept by the researcher. At the end of the treatment (which lasted for three weeks), a parallel test using IIT were re-administered. 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 favourable effect and if it is negative, it has an adverse effect.

Results

Research Question 1: What is the effect of gender on students' interest when taught crop production with self-instructional package and conventional lecture approach?

Table 1: **Mean of Respondents on the Effect of Gender on Students' Interest when Taught Crop Production with Self-instructional Package and Conventional Lecture approach**

		Pretest	Posttest	
Gender	N	$\bar{x}$	$\bar{x}$	Mean Gain
Male	151	62.08	68.62	6.54
Female	226	63.80	68.84	5.04

Results in Table 1 shows the effect of gender on students' interest. Result show that the male group taught crop production had a pretest interest mean score of 62.08 and a posttest interest mean score of 68.62 The difference between the pretest and posttest interest mean for the male group was 6.54. The Female group taught crop production had a pretest interest mean score of 63.80 and a posttest mean score of 68.84. The difference between the pretest and posttest mean for female group was 5.04. However, for both male and female groups, the posttest mean scores were greater than the pretest means with the male group having the higher mean gain. This is an indication that gender may have effect on students' interest. To test whether the difference between the mean interest scores of male and female students is significant, see hypothesis two

Hypothesis 1: There is no significant difference in the mean interest scores of male and female students taught crop production with self-instructional package and conventional lecture approach**.**

Table 2: Analysis of Covariance (ANCOVA) of the Significant Difference in the Mean Interest Scores of Male and Female Students Taught Crop Production with Self-instructional Package and Conventional Lecture Approaches

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1727.061[a]	2	863.531	8.788	.000
Intercept	36652.048	1	36652.048	372.988	.000
PretestInt	1722.486	1	1722.486	17.529	.000
Gender	1.005	1	1.005	.010	.919
Error	36751.501	374	98.266		
Total	1820427.000	377			
Corrected Total	38478.562	376			

The result in Table 2 shows that with respect to mean interest scores of male and female students taught crop production with self-instructional package (SIP) and conventional lecture approach, an F-ratio of 0.01 was obtained with associated probability value of 0.92. Since the associated probability value of (0.92) was greater than 0.05 set as bench mark, the null hypothesis (H_{02}) which stated that there is no significant difference in the mean interest scores of male and female students taught crop production with self-instructional package and conventional lecture approach was not rejected. Thus, there was no significant difference in the mean interest scores of male and female students taught crop production with self-instructional package and conventional lecture approach.

Research Question 2: What is the effect of school type on students' interest taught crop production with self-instructional package and conventional lecture approach?

Table 3: **Mean of Respondents on the Effects of School Type on Students' Interest Taught Crop Production with Self-instructional Package and Conventional Lecture approach**

		Pretest	Posttest	
School Type	N	$\bar{x}$	$\bar{x}$	Mean Gain
Single Male	96	62.33	69.00	6.67
Single Female	140	67.83	69.55	1.72
Coeducational	141	58.96	67.79	8.83

Result in Table 3 shows the effect of school type on the interest score of students. Result shows that students from boys' school taught crop production had a pretest interest mean score of 62.33 and a posttest interest mean score of 69.00. The difference between the pretest and posttest mean for the boys' school was 6.67. The girls' school taught crop production had a pretest interest mean score of 67.83 and a posttest mean score of 69.. The difference between the pretest and posttest mean for girls' school was 1.72. Students from coeducational schools had a pretest interest mean score of 58.96 and posttest mean score of 67.79. The difference between the pretest and posttest for the coeducational schools was 8.83. However, for each of the schools, the posttest mean scores were greater than the pretest means with students from coeducational schools having the higher interest mean gain followed by boys' schools and lastly the girls' schools. This is an indication that school type may have effect on students' interest. To test whether the difference between the mean interest scores of students with regards to school type is significant, see hypothesis four.

Hypothesis 2: There is no significant difference in the mean interest scores among the students of different school types taught crop production with self-instructional package and conventional lecture approach.

Table 4: Analysis of Covariance (ANCOVA) of the Significant Difference in the Mean Interest Scores Among the Students of Different School Types Taught Crop Production with Self-instructional Package and Conventional Lecture Approaches

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1746.780[a]	3	582.260	5.913	.001
Intercept	32549.940	1	32549.940	330.535	.000
PretestInt	1520.484	1	1520.484	15.440	.000
SchType	20.724	2	10.362	.105	.900
Error	36731.783	373	98.477		
Total	1820427.000	377			
Corrected Total	38478.562	376			

The result in Table 4 shows that with respect to mean interest scores among the students of different school types taught crop production with self-instructional package and conventional lecture approach, an F-ratio of 0.11 was obtained with associated probability value of 0.90. Since the associated probability value of (0.90) was greater than 0.05 set as bench mark, the null hypothesis ($H0_4$) which stated that there is no significant difference in the mean interest scores among the students of different school types taught crop production with self-instructional package and conventional lecture approach was not

rejected. Inference drawn therefore is that respondents from different school types did not differ significantly in their mean interest scores when taught crop production with self-instructional package and conventional lecture approach.

Discussion of Findings

The findings revealed that male students had a higher mean score in interest inventory test than the female students in both the experimental and control groups. The analysis revealed a no significant difference between the mean effect of gender (male and female) in students' interest. This shows that the difference between the mean score of male and female students taught crop production with self-instructional package and conventional lecture approach was not statistically different. This finding is in consonance with Eze, (2016), who reported that though male students at times perform a little bit higher than the female students in terms of academic achievement, yet the two categories of students might exhibit the same level of interest in such subject.

The findings also revealed that students from co-educational schools recorded higher interest mean score, followed by single sex males and single sex females. There was no significant difference in the mean interest scores of students in interest inventory test. This shows that self-instructional package, if adopted will improve the interest of students in all school type.

Conclusion

Based on the findings of this study, it was concluded that both gender and school types taught agricultural science using Self Instructional Package develop more interest than their counterparts taught using the conventional lecture methods. The interest of students can be enhanced through the use of innovative and interactive/participatory teaching methods such as SIP.

Recommendations

On the basis of the findings, discussion and conclusion, it was recommended that;

1. The curriculum used for teaching schools should be reviewed to include innovative, students centered teaching and learning methods and techniques such as self-instructional package for effective teaching and learning in secondary schools. The ministry of education, curriculum planners and the Nigeria Educational Research and Development Council (NERDC) should note this in subsequent review of the curriculum of instruction at the secondary school level.

2. Workshops, seminars and conferences should be organized by the ministry of education and school administrators to enlighten teachers and improve their knowledge and skills in the use of Self-Instructional Package for improving students' academic achievement.

3. Teachers of agricultural science should be encouraged by the ministry of education and school administrators to adopt self-instructional package in their teaching – learning process through the provision of necessary instructional materials and remuneration for teachers...

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