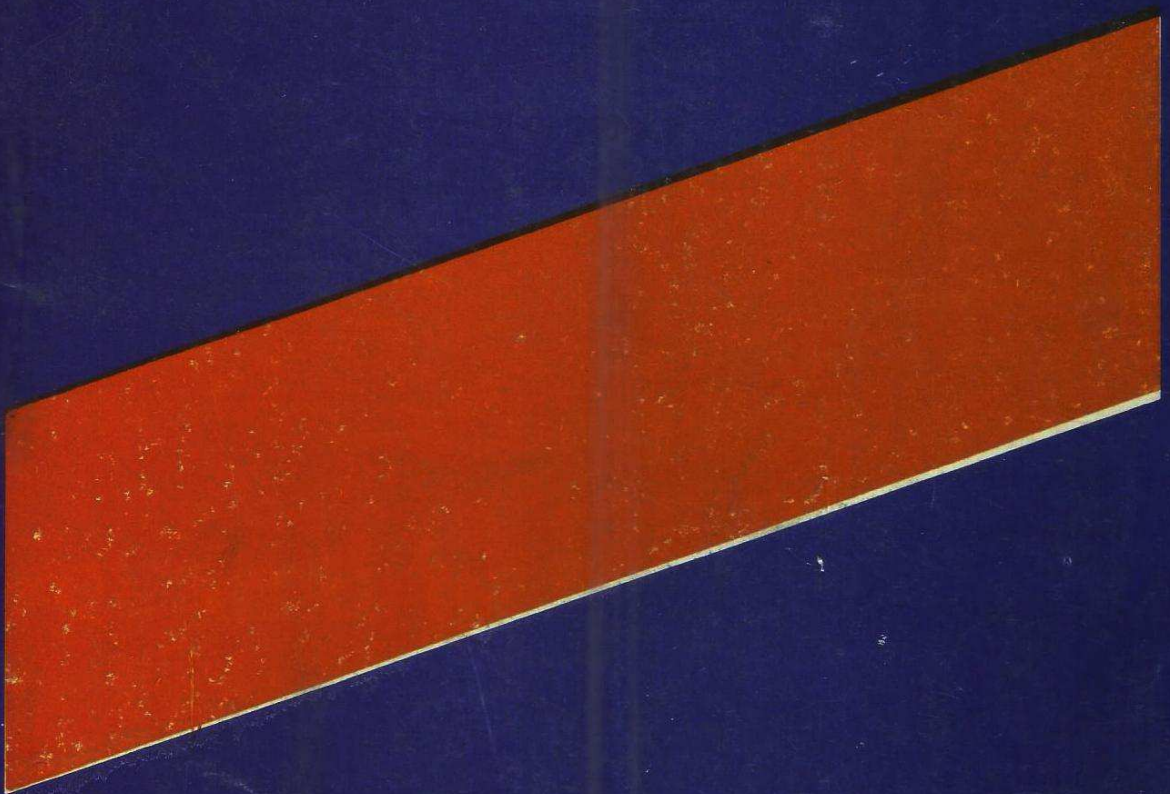


JOURNAL OF EDUCATIONAL RESEARCH AND POLICIES

VOL. 3, NO. 1, 2008



DUNCAN SCIENCE

EFFECTS OF GROUP AND INDIVIDUALISTIC INSTRUCTIONAL STRATEGIES ON STUDENTS' PERFORMANCE IN AGRICULTURAL SCIENCE

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ABSTRACT

This study investigated the effects of group and individualistic instructional strategies on the performance of Senior Secondary Agricultural Science students. A criterion sampling technique was adopted to select four (4) co-educational schools. A total of 188 Senior Secondary Two (SS2) Agricultural Science students were involved in the study. This number was made up of 91 males and 97 females from the four (4) co-educational schools in Afikpo North Local Government Area of Ebonyi State of Nigeria. A pretest – posttest non-randomized control group design was used for the study. The instrument used for gathering data for the study was Agricultural Science Achievement Test (ASAT). The data collected were analyzed using Analysis of covariance (ANOVA) and Multiple Classification Analysis (MCA) using pretest scores as covariates. From the findings, it was observed that group instructional strategy enhances students' performance in Agricultural Science than the individualistic instructional strategy. The results also showed a non-significant difference between the performance of male and female Agricultural Science students taught using group and individualistic instructional strategy. On the basis of the above findings, it is recommended that group instructional strategy should be adopted in schools by teachers to teach various concepts in Agricultural Science.

Keywords: *Group/Individualistic Instructional Strategies, Students' performance.*

INTRODUCTION

During the teaching and learning of Agricultural Science, the selection and utilization of appropriate instructional strategies is a precursor. Efforts in the Nigerian Education context have been geared towards encouraging more students to study Agricultural Science (Okpala, 2002). It is also expected that students' academic performance in Agricultural Science should be of high quality. Students' achievements in Agricultural Science as measured by classroom tests and Senior School Certificate Examination (SSCE) are clear indicators of performances in the subject (Ivowi, 1997). Previous studies tried to show that students' performance in Agricultural Science is rather very low (Okpala, 2002; Ibeagha, 1996). This could be attributed to poor attitude of students. Other reasons are overloaded curriculum and ineffective teaching (Ogunniyi, 1993; Ivowi, 1997). Most of those studies, despite their scope tend to look at relationships rather than manipulate some of the variables to find their effects on learning outcomes. Such variables that could be manipulated include group instructional strategies. Group instructional strategies are ways of bringing about changes into teaching in Nigerian secondary schools. It inculcates the spirit of team-work into the students which is needed among scientists in particular. It involves interaction among students in order to enhance learning (Johnson & Johnson, 1999). In the group instructional strategies, the class is divided or re-arranged into 3, 4 or 5 groups, depending on the size of the class and the nature of the work to be done. The basis for this strategies is that the students will actively be involved in the learning process, and as the students will be in a free atmosphere, they are likely to learn effectively through the help of their mates rather than when the teacher does all the teaching (Johnson & Johnson, 1997). Mckeachie (1996); Dansereau (1998); Slavin (2000) and Sharan and Sharan (2002) in their studies of peer/group interaction achievement relationships in a variety of contexts have indicated that students working together are more successful than students working individually. Individualistic instructional strategy is a teaching approach which merely sees the students as recipient of facts and information. In this type of communication according to Emina (1996), "students are compelled to accept statements solely on the authority of the teacher, he is the main actor who addresses the students". This method (Akpan, 1993) does not allow active student participant in science lessons. There is the need to review existing strategies and compare them with new strategies to find out which is more effective. This would also help to find out which strategies are more suited for developing the skills appropriate for Agricultural Science learning. Such strategies should also be exploited to advantage. Another area of concern in this study was the assessment of the influence of gender on students' performance in Agricultural

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science. Gender issue in Nigeria has become an issue of concern in the past few years. A wealth of research over the past two decades has established that improving female education is crucial for development (Herz et al, 2001; King and Hill, 2001; Bellow et al, 2002). As schools and educational institutions are becoming more structured, sex differences in education and academic performance assume new and more focus of researchers. There is the need therefore, to find the effects of group and individualistic instructional strategies on students' performance in Agricultural Science as well as to compare the academic performance of male and female Agricultural Science students taught with group and individualistic instructional strategies. It is against this background that this study has emerged.

STATEMENT OF THE PROBLEM

Presently, Agricultural Science is faced with numerous problems especially in the teaching of the subject in the secondary schools. Evidences in Senior Secondary Certificate Examination (SSCE) revealed a consistent poor performance in Agricultural Science. The teacher and his method of teaching often come under attack. If the instructional strategy for teaching of Agricultural Science has been blamed severally for the inability of students to perform credibly, it therefore become necessary to find out empirically the effects of instructional strategies on senior secondary students' performance in Agricultural Science.

PURPOSE OF THE STUDY

The overall purpose of this study was to determine the effects of instructional strategies on senior secondary students' academic performance in Agricultural Science. Specifically, the study sought to:

1. Compare the academic performances of senior secondary Agricultural Science students taught with group instructional strategy and those taught with individualistic instructional strategy.
2. Compare the academic performances of male and female Agricultural Science students taught with group instructional strategy and those taught with individualistic instructional strategy.

Research Hypotheses: The following hypotheses were formulated and tested.

Ho1: There is no significant difference between the academic performance of agricultural Science students taught with group instructional strategy and those taught with individualistic instructional strategy.

Ho2: There is no significant difference between the academic performance of male and female Agricultural Science students taught with group instructional strategy and those taught with individualistic instructional strategy.

Research Design: Non-randomized pretest – posttest control group design was adopted because of the use of intact classes as experimental and control group.

Population of the Study: The population of the study was all the Senior Secondary Two (SS2) Agricultural Science students in all the twelve (12) secondary schools in Afikpo North Local Government Area of Ebonyi State. The population size was one thousand, four hundred and forty (1440) Senior Secondary Two (SS2) Agricultural Science students.

Sample and Sampling Technique: Criterion – sampling technique was used to select schools from the target population. The criteria used were:

- i. Schools that have moderately equipped and functional Agricultural Science laboratories.
- ii. Schools that have at least one graduate Agricultural Science teacher with at least three years of teaching experience. Seven schools met the above criteria. A random sampling technique through the use of balloting was carried out to select four schools among those that met the above criteria. Two (2) intact classes made up of 95 students were used as experimental group while the other two (2) intact classes made up of 93 students were used as control group.

Instrument and Validation: A researcher-made instrument, Agricultural Science Achievement Test (ASAT) comprised of 50-multiple choice items in concept of poultry production and management was used to gather data for the study. Validity of the items was assessed at the time the instrument was developed by two instructional material experts and one Agricultural educator. Items related to each instructional objective were selected for the

instrument. The instrument was trial tested to establish reliability. The Kuder Richardson coefficient of internal consistency for the instrument (ASAT) was 0.75 and this was significant at 0.05 level.

Research procedure: Pretests of Agricultural Science Achievement Test (ASAT) was administered to the two groups (experimental group and control group). They were required to answer all questions independently. Treatments were given by the teachers to experimental group (experimental group were exposed to group instructional strategy) in each school for three (3) weeks. The control groups were taught using individualistic instructional strategy for the same period of time. A well articulated lesson package prepared by the researcher was used by the teachers in selected schools to teach the concepts, Poultry production and management system in order to standardize the treatment adapted for the study. After three (3) weeks teaching period, posttest Agricultural Science Achievement Test (ASAT) was administered to the two groups (experimental group and control group).

METHOD OF DATA ANALYSIS

The data collected were analyzed using Analysis of Covariance (ANCOVA) using pretest scores as covariates, Multiple Classification Analysis (MCA) and Scheffe's Post hoc test. All the hypotheses were tested at 0.05 level of significance.

RESULTS

Hypothesis One (Ho1): There is no significant difference between the academic performance of agricultural science students taught with group instructional strategy and those taught with individualistic instructional strategy. The analysis is shown in table one.

Table 1: One-way Analysis of Covariance (ANCOVA) of Posttest Scores of Agricultural Science Students Taught with group and individualistic instructional strategies

Source of Variation	SS	DF	MS	F	Decision at P<.05
Pretest	7964.025	1	7964.03	173.00	*
Main effects	3908.34	1	3908.34	84.90	*
Explained	11872.36	2	5936.18	128.95	*
Residual	8516.57	185	46.04		
Total	20388.94	187	109.03		

* = Significant at P<.05 alpha level

Critical F = value = 3.89

Table 1 shows that the instructional strategy main effect was significant at P<.05. The calculated F-Value, 84.90 is greater than the critical F-value, 3.89, therefore the null hypothesis stating a non significant difference between the performance of agricultural science students taught with group and individualistic instructional strategies were rejected. This implies that there exists significant difference between the performance of agricultural students taught with group and individualistic instructional strategies. However, consequent upon the existence of significant difference in instructional strategies, it is necessary to consider the Multiple Classification Analysis (MCA) of the two levels of the instructional strategies to determine the specific contribution of the level to the gain in students' performance in agricultural science.

Table 2: Multiple Classification Analysis (MCA) showing one way Analysis of Covariance of Instructional Strategies (group and individualistic) Using Pretest As Covariates

Variable + category	N	Unadjusted		Adjusted for independent variable and covariates	
		Dev'n	Eta	Dev'n	Beta
Instructional strategies			0.57		0.45
Group	95	5.92		4.65	
Individualistic	93	-6.04		-4.75	

Multiple R. squared = 0.58

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Multiple R: = 0.76

The analysis in table 2 shows that the agricultural students taught with group instructional strategy performed significantly better than those taught with individualistic instructional strategy. The analysis in table 2 also shows a multiple regression index of $R = 0.76$ with a multiple regression squared index of $R^2 = 0.58$. This implies that 58% of the total variance in the performance of students in agricultural science is attributable to the influence of instructional strategies.

Hypothesis Two (Ho2): There is no significant difference between the academic performance of male and female agricultural science students taught with:

- i. Group instructional strategy
- ii. Individualistic instructional strategy

Ho2 i: There is no significant difference between the academic performance of male and female agricultural science students taught with group instructional strategy. The analysis is shown in table three.

Table 3: One-way Analysis of Covariance (ANCOVA) of Posttest Scores of Male and Female Students taught with Group Instructional Strategy using Pretest Scores as Covariates

Source of Variation	SS	DF	MS	F	Decision at P<.05
Pretest	1439.01	1	1439.01	26.13	*
Main effects	19.02	1	19.02	0.35	NS
Explained	1458.03	2	729.02	13.24	*
Residual	5065.76	92	55.06		
Total	6523.79	94	69.40		

* = Significant at $p < .05$ alpha level

NS = Not significant at $p < .05$ alpha level

Critical F = value = 3.94

Table 3 shows that the gender was not significant at $p < .05$. The calculated F-value, 0.35 is less than the critical F-value, 3.94, therefore the null hypothesis stating a non-significant difference between the academic performance of male and female Agricultural Science students taught with group instructional strategy was retained. This implies that gender does not significantly influence students' performance in agricultural science when students are taught with group instructional strategy.

Ho2(ii): There is no significant difference between the academic performance of male and female agricultural science students taught with individualistic instructional strategy.

The analysis is shown in Table 4

Table 4: One-way Analysis of Covariance (ANCOVA) of posttest scores of male and female students taught with individualistic instructional strategy using pretest as covariates

Source of Variation	SS	DF	MS	F	Decision at P<.05
Pretest	3899.12	1	3899.12	108.39	*
Main effects	4.63	1	4.63	0.13	NS
Explained	3903.75	2	1951.87	54.26	*
Residual	3237.50	90	35.97		
Total	7141.25	92	77.62		

* = Significant at $p < .05$ alpha level

NS = Not significant at $p < .05$ alpha level

Critical F-value = 3.94

Table 4 shows that the gender main effect was not significant at $p < .05$. The calculated F-value, 0.13 is less than the critical F-value, 3.94, therefore the null hypothesis stating a non-significant difference between the academic performance of male and female agricultural science students taught with individual instructional strategy was retained. This implies that gender does not significantly influence students' performance in agricultural science when students are taught with individualistic instructional strategy.

DISCUSSION OF RESULTS

The results of hypothesis one showed that a significant difference was found between the academic performance of Agricultural Science students taught with group instructional strategy and those taught with individualistic instructional strategy. The analysis in table 2 shows that the Agricultural Science students taught with group instructional strategy performed significantly better than those taught with individualistic instructional strategy. The results of this study are in agreement with those of Sharan and Shaulor (2002) and Cone (2002) that the use of group instructional strategy enhances the performance of students due to the fact that the interaction that occurs among them during the class teaching and in solving problems together serves as encouragement and a motivating factor. The results of hypothesis two showed that there is no significant difference between the academic performance of male and female Agricultural Science students taught with group instructional strategy and individualistic instructional strategy. The non-significant difference in the achievement of male and female Agricultural Science students is in line with the findings of Erinoshio (1994) and Nsofor (2001) that both males and females could do well in science if exposed to similar learning conditions.

CONCLUSION

On the basis of the findings in this study, the following conclusions were drawn:

1. Group instructional strategy enhances students' performance in Agricultural Science than the individualistic instructional strategy.
2. On the basis of sex, male students are not significantly better than their female counterparts in performance irrespective of the instructional strategy utilized.

RECOMMENDATIONS

Based on the results of the study, the following recommendations were made:

1. Seminar/workshops should be organized for Agricultural Science teachers to appraise them with new teaching strategy like group instructional strategy.
2. Group instructional strategy should be adopted in teaching both male and female students in secondary schools.

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