Gender Differences in the Achievement and Retention of Nigerian Students Exposed to Concepts in Social Studies Through Multi-Media Packages

Adeosun Olufemi Victor
Department of Curriculum Studies, University of Ado-Ekiti, Ekiti State, Nigeria

Abstract: This study investigated gender differences in the achievement and retention of Nigerian students exposed to concepts in Social Studies through multi-media packages. The purpose was to find which of the sexes would achieve or retain better than the other having been exposed to Social Studies through multi-media packages. The study was quasi-experimental using 160 JSS 2 students randomly selected into 3 experimental and one control groups. A 30-item test designed and validated by the researcher and some professionals was used to collect data which were analysed using ANCOVA and Multiple Classification Analysis. Two hypotheses were formulated and tested and the results showed that none of the sexes achieved significantly better than the other but that the female students retained significantly more than the male students. Based on the findings, some recommendations were made.

Key words: Gender different, concept of social studies, multi-media package

INTRODUCTION

There has been an increasing concern over the years about the rights of women and, especially, in Nigeria, discussions on gender issues have been on the increase. This is not unconnected with the observations and beliefs of many scholars that the female gender is greatly marginalized in Africa, Nigeria not being an exception (Udoh, 2001; Popoola, 2002). Though gender as a term is used to describe male and female persons, it is a construct that is socio-cultural in all essential points rather than physiological. This is due to the fact that it distinguishes roles, behaviours, mental and emotional characteristics of the male and female only as prescribed by the society (Bassow, 1991; Keller, 1991). These prescriptions could thereby determine the perceptions of, involvements in and contributions of the different sexes to their immediate societies.

One of the areas of life which have been affected by gender differences is the field of education and precisely that of academic performance of students. This is partly because gender roles affect familiarity with academic content, career aspirations, attitude towards subjects, teachers' expectations and preferred approaches and these in turn affect academic performance (Equal Opportunities Commission, 2001; Akinbamidele, 2008). Many scholars have researched into gender differences in academic performance especially in the sciences and mathematics. Many have found that the male students performed significantly better than their female counter-

parts (Simpson and Oliver, 1985; Zergal et al., 1985; Okpala and Onocha, 1995; Oyedeji, 1996; Adesoji and Fisuyi, 2001; Mboto, 2001; Kolawole, 2002; Adeyeye et al., 2002; Oginni, 2007). But, a few scholars have also found no significant difference in academic performance in science and mathematics between male and female students (Daramola, 1992; Amposah and Krekling, 2000; Ogunkola, 2000; Owolabi, 2002).

The controversy could therefore be said to continue as to which of the sexes would have better academic performance. The same can also be said with regards to Social Studies. Akinbote (1999) found no significant differences between boys and girls in his study on cognitive achievement in and attitude towards social studies between primary school boys and girls. In the case of Alabi (2002), however, the girls were found to perform better than the boys in social studies. His explanation was to the effect that the girls were more patient listeners than the boys which made them assimilate and recall better than the boys.

Is it not therefore better, to look beyond gender characteristics into the interaction between individual learner's specific characteristics and particular features of instructional treatment in order to determine the reasons for academic performance? The trait-treatment interaction theory suggests that there is a connection between personality traits of the learner on one hand and variables of the instructional situation on the other and that the effect of learning must be interpreted as the result of that interaction (Heidt, 1978).

Since, learners have individual differences which means that they have different features of the instructional situations which may appeal to them, it may therefore be assumed that they would find a common ground not only for learning but for retaining what is learnt in multi-media packages. Since the effectiveness of multi-media packages have also been attested to (Smallwood, 1996; Gardner, 2002), these may also be assumed to have the potency of knocking off gender characteristics which may be claimed to influence academic achievement. This study therefore set out to discover if gender difference would occur when students are exposed to social studies through different multi-media packages.

Hypotheses: Two hypotheses were generated and tested in the study. The hypotheses are stated:

- There is no significant difference between the achievement mean scores of male and female subjects in each of the experimental and the control groups.
- There is no significant difference between the retention mean scores of male and female subjects in each of the experimental and the control groups.

MATERIALS AND METHODS

Research design: This study adopted the quasi-experimental pretest-posttest control group design. Four groups of study subjects which were randomly assigned to treatment and control groups responded to the pretest and posttest administered on them. Three experimental groups responded to the posttest after exposure to different treatment conditions while the control group responded to the posttest without any treatment. The design of the study is as follows:

Experimental group I --	O^1	X^1	O^2	
Experimental group II --	O^3	X^2	O^4	
Experimental group III --	O^5	X^3	O^6	
Control group	--	O^7	-	O^8

Where,

$O^1 \, O^3 \, O^5 \, O^7$ = Measurement (Pretest).
$O^2 \, O^4 \, O^6 \, O^8$ = Measurement (Posttest).
X^1 = Treatment (videotape, pictures and chalk and talk).
X^2 = Treatment (audiotape, pictures and chalk and talk).
X^3 = Treatment (pictures and chalk and talk).
-       = No treatment.

The independent variables consisted of the method varied in four ways, while the dependent variable were the posttest and the retention test.

Sample and sampling techniques: The population for the study consisted of all the Junior Secondary Class two students in four schools selected for the study. The subjects for the study consisted of 160 Junior Secondary Class 2 (JSS 2) students randomly selected from four schools into the four groups used for the study. In which case, each group had 40 students. The stratified random sampling technique was adopted to select the four schools used for the study. The stratification was based on the geographical location of the schools. This was to ensure that each of them was located far away from the others so as to avoid interactions between the subjects of different treatment groups during the experiment.

Moreover, to select the 40 students in each school, the pretest was administered to 100 students randomly selected in each school. Their responses were scored and 40 students were randomly selected in each school to participate in the experiment. The researcher, however, ensured that the subjects selected in each school had nearly equal performances with those of the other schools and that there was sex balance in the selection in each school. This means that there were 20 male students and 20 female students selected in each school. Their pretest scores were computer-analyzed using the one-way Analysis of Variance and it was found that there was no significant difference between the mean scores of the groups. This was to ensure the homogeneity of the groups with regards to their entry performance levels. Each group was, thereafter randomly assigned to the treatment groups.

Research instrument: The instrument used for the study was the Social Studies Achievement Test (SSAT) designed by the researcher in collaboration with four Social Studies teachers. The SSAT is a 30-item multiple-choice test based on three major topics *viz:* political institutions, economic institutions and legal institutions. It was designed to measure the students' achievement in Social Studies. It was used for the pretest and was later re-arranged and used for the posttest and retention test. The test items covered all the contents of the lesson plans developed to cover the major topics used for the study. The contents were derived from the schools' scheme of work while the lesson plans were drawn with the recommended text for the schools as reference.

The instrument was validated in the following ways. The face and content validities were determined by experts in social studies, tests and measurement, guidance and counselling and language education. The SSAT in its original form was also administered to 120 JSS 2 students from two schools other than the ones used for the study. The responses of the students were subjected to an item analysis procedure prescribed by Gronlund (1976). Through this analysis, test items, which were found to

have a difficulty index of between 40 and 70% and a discriminating power of 0.40 and above were retained. Based on these criteria, thirty items found acceptable were retained.

The reliability of the instrument was also determined through the test retest method using two weeks interval. Using the Pearson Product Moment Correlation analysis, a reliability co-efficient of 0.83 was obtained and this was considered adequate for the study.

Instructional packages: The instructional packages used for the lesson included nine lesson plans developed on the three major topics used for the treatment groups and also the instructional materials which constituted the multi-media packages used for the study. The instructional materials also included videotape recordings, audiotape recordings and pictures. The videotape recordings included live activities of examples of various types of institutions taught like a session of the House of Assembly, political party campaigns, election, king-in-council, industries, farms, markets, bank, court sessions and some policemen on duty. The audiotape had recorded in it the sound of all the activities as recorded in the videotape while the pictures were cuts from calendars on executive council of a state, governor on inspection, markets, bank, poultry, court session, policemen on duty, etc.

Research procedure: Having sought permission and cooperation from principals and Social Studies teachers of the four schools used, the researcher, with the assistance of the teachers administered the pretest on the students and used their responses to select the study sample as explained earlier. The treatment took 3 weeks after which the posttest was administered on the students. The control group also had its own tests at the same time with the other groups while the retention test was administered two weeks after the posttest had been administered.

Data analysis: The data collected were computer-analysed using the appropriate descriptive and inferential statistics of the Statistical Package for the Social Sciences (SPSS) Programme. In testing for possible post- experimental difference in achievement and retention between the sexes, the Analysis of Covariance (ANCOVA) was used and the hypotheses were tested at 0.05 level of significance. Post-hoc analyses were also carried out using the Multiple Classification Analysis (MCA).

RESULTS

Hypothesis 1: There is no significant difference between the achievement mean scores of male and female subjects in each of the experimental and the control groups.

Table 1: Summary of ANCOVA on the achievement mean scores of male and female subjects

Source of variation	SS	Df	MS	F	p-value
Covariates	2.826	1	2.826	0.231	0.63
Pretest scores	2.826	1	2.826	0.231	0.63
Main effects	343.362	4	85.841	7.018	0.00
Sex	15.557	1	15.557	1.272	0.26**
Group	327.811	3	109.270	8.934	0.00
2-way interactions	58.309	3	19.436	1.589	0.19
Sex×group	58.309	3	19.436	1.589	0.19
Explained	404.498	8	50.562	4.134	0.00
Residual	1846.877	151	12.231		
Total	2251.375	159	14.160		

**Not significant at $p > 0.05$

Table 2: Multiple classification analysis of achievement mean scores of male and female subjects in the different groups

Grand mean =	15.95			Adjusted for Independent	
Variable+ category	N	Unadjusted deviation	Eta	+covariate deviation	Beta
Sex:					
Male	80	-0.31		-0.31	
Female	80	0.31		0.31	
			0.08		0.0
Groups:					
V+P+C (E_1)	40	-0.74		-0.74	
A+P+C (E_2)	40	0.66		0.66	
P+C (E_3)	40	1.94		1.94	
Control	40	-1.86		-1.86	
			0.38		0.3
Multiple R^2					0.15
Multiple R					0.39

To test this hypothesis, the Analysis of Covariance (ANCOVA) was computed. The results are presented in Table 1 and 2.

Table 1 shows significant main effects for the groups ($F = 8.934$; $p < 0.00$) but not for the sexes ($F = 1.272$; $p < 0.26$). In order to provide some indications of the performances of the groups, a Multiple Classification Analysis (MCA) was computed. The results are presented in Table 2.

The MCA (Table 2) shows that the female has the higher adjusted mean (15.88), although not significantly different, while the male has the lower (15.25). It also shows that the E_3 has the highest adjusted mean among the groups (17.50), followed by E_2 (16.23) and E_1 (14.83) respectively, with the control group having the lowest (13.70).

On the basis of these findings, hypothesis 1 was thereby accepted. There was no significant differences in the achievement mean scores of male and female subjects in each of the experimental and the control groups.

Hypothesis 2: There is no significant difference between the retention mean scores of male and female subjects in each of the experimental and the control groups.

To test this hypothesis, the Analysis of Covariance (ANCOVA) was computed. The results are presented in Table 3 and 4.

Table 3: Summary of ANCOVA on the retention mean scores of male and female subjects

Source of Variation	SS	Df	MS	F	p-value
Covariates	7.981	1	7.981	0.407	0.52
Pretest scores	7.981	1	7.981	0.407	0.52
Main effects	681.962	4	170.490	8.704	0.00
Sex	188.785	1	188.785	9.638	00**
Group	493.168	3	164.389	8.393	0.00
2-way interactions	176.817	3	58.939	3.009	0.03
Sex×group	176.817	3	58.939	3.009	0.03
Explained	866.760	8	108.345	5.531	0.00
Residual	2957.640	151	19.587		
Total	3824.400	159	24.053		

** Significant at $p<0.05$

Table 4: Multiple classification analysis of retention mean scores of male and female subjects in the different groups

Grand mean =	16.35			Adjusted for Independent	
Variable+ category	N	Unadjusted deviation	Eta	+covariate deviation	Beta
Sex:					
Male	80	-1.09		-1.09	
Female	80	1.09		1.09	
			0.22		0.2
Groups:					
V+P+C (E_1)	40	-2.28		-2.28	
A+P+C (E_2)	40	-0.03		-0.03	
P+C (E_3)	40	2.65		2.65	
Control	40	-0.35		-0.35	
			0.36		0.3
Multiple R^2					0.18
Multiple R					0.42

Table 3 has revealed significant main effects both for the groups (F = 8.393; p<0.00) and for the sex (F = 9.638; p<0.00). In order to provide some indications of the performances of the groups, a Multiple Classification Analysis (MCA) was computed. The results are presented in Table 4.

The MCA (Table 4) shows that the female has the higher adjusted mean (17.44), while the male has the lower (15.26). It also shows that the E_3 has the highest adjusted mean among the groups (19.00), followed by E_2 (16.33) and the control group (16.00) respectively, with the E_1 having the lowest (14.08).

On the basis of these findings, hypothesis 2 was thereby rejected. There was a significant difference in the retention mean scores of male and female subjects in each of the experimental and the control groups.

DISCUSSION

The findings of this study have revealed no significant difference in achievement between male and female subjects in each of the groups. This is not surprising as none of the multi-media packages used is specifically more inclined in influence on learning towards a particular sex. The finding confirms that of Akinbote (1999) who found no significant difference between boys and girls in cognitive achievement in social studies. This finding has come to lend credence to the initial suggestion that multi-media packages will provide a common ground for learning by any sex by knocking off individual differences which may exist due to gender characteristics. In which case, it is better for teachers to focus more on utilizing combined media which will appeal to different individual differences.

However, a significant difference was found in retention between the sexes. This could be accounted for by the disuse theory and the interference theory of retention (Hulse *et al.*, 1980). Actually, girls are more involved in economic activities than the boys while none of them is more involved in political or legal activities. It is, therefore, expected that the learning of the girls on economic institutions would be reinforced by practice more than that of the boys. They are, therefore, likely to retain what they have learnt in that area more than the boys.

Moreover, boys engage more in activities that can be inhibitory to their retention. They are more likely to engage in football and football issues. They are also likely to be involved in farming. The little time they may have to settle their minds on academics may then be spent on subjects like mathematics and integrated science which are part of the subjects given masculine image in the African educational setting (Okpala and Onocha, 1995). These issues may explain why the girls have retained significantly more than the boys (except for the experimental group which used the videotape as part of its package).

CONCLUSION

This study has revealed that there is no significant difference in achievement in social studies between male and female students. It has also shown that significant difference exists between them in retention. It is, therefore, pertinent to say that personal characteristics, rather than gender characteristics, are to be looked into to determine academic performance of students.

It is also essential to say that the use of multi-media packages will nullify the differences that may be warranted by personal characteristics and make learning better, regardless of gender.

RECOMMENDATIONS

Based on the findings, the following recommendations are made:

- Nigerian teachers and educational researchers should focus more attention on the use of multi-media packages in schools rather than gender issues in academic performance.
- The Nigerian government should provide adequate instructional materials in schools so that the combination of materials to make multi-media packages for use in schools would be easy.

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