

Relative Effects of Three Multi-Media Instructional Packages on Nigerian Student's Achievement in Social Studies

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Abstract: This study investigated the relative effects of three multi-media instructional packages on students' achievement in social studies. The purpose was to determine which of the combinations of videotape recording presentation, pictures and the chalk and talk method; the combination of audiotape recording presentation, pictures and the chalk and talk method and the combination of pictures and the chalk and talk method was most effective for the teaching of social studies in secondary schools. 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 and the data collected were analyzed using ANCOVA, MCA and t-test. Two hypotheses were formulated and tested and the results showed that the combination of pictures and the chalk and talk method was most effective among the packages tested in the learning of social studies. Based on the findings, some recommendations were made.

Key words: Relative effects, multi-media, instructional, packages, achievement

INTRODUCTION

This is the age of information and communication technology in which all efforts are being made the world over to connect nations, organizations and peoples and thereby make the world a global village. These efforts have made information dissemination in volume easier, cheaper and more beneficial to everyone. Of note is the effect on education and especially instructional situations where information and communication technology has solved a lot of problems (Knupp, 1996; Krawchuk, 1996; Bandele, 2001).

The advantages derived from the use of information and communication gadgets have encouraged educational organizations to tool-up their instructional systems such that, in various schools today, it is not uncommon to find the agitation for the purchase and use of computers, projectors and internet facilities so as to make instruction easier and more effective and result-oriented. From observation, this is the case, at least, with Nigeria where government at all levels is making efforts to supply computers to schools so that students can at least learn about the computer at the secondary school level. Universities and other higher institutions are also acquiring multi-media projectors which would help to make instruction easier.

All these efforts are yielding results because of the advantages inherent in the use of the gadgets. They are highly influential in the process of instruction. They

attract and sustain attention of students, provide for individual differences in learning and make a report of the learning situations possible. Moreover, travel time can be eliminated by bridging events to the classroom while processes like pregnancy and childbirth which requires considerable viewing time can be condensed photographically (Ajiboye, 1996; Aremu, 2001).

However, much as it is observed that government is making efforts to supply computers and other instructional gadgets in Nigerian schools, the supply is still a very far cry from what is needed. In fact, most primary and secondary schools in Nigeria are still struggling to have the basic facilities needed like louver blades on their windows, ceilings, desks and chairs, electricity, adequate and functioning plant structure, etc. This prompted Fafunwa (1999) to suggest that computers should not be priorities for Nigerian schools but the basic facilities needed for proper learning. The situation has not changed much as scholars have continued to bemoan the dearth of necessary equipment for instruction in Nigeria schools (Afolabi *et al.*, 1999; Omole, 1999; Seweje, 2000; Kolawole and Anikpo, 2001).

Due to the problem, the traditional chalk and talk method is still mostly used in Nigerian schools. The teaching of Social Studies is not an exception. Moreover, with the consciousness of the absence of modern instructional gadgets teachers are being encouraged to garnish their lessons with the use of available locally-made instructional materials like charts, pictures and

realia. Moreover, since the current trend in instruction is no longer that of recommending a particular method of teaching but a combination of two or more, teachers are being encouraged to make use of the multi-media approach in teaching (Kadiri, 1999). Hence, the necessary focus on multi-media packages.

Perhaps, the use of multi-media packages might have been the response to the disappointing performances of the television in teaching higher categories of learning like abstract concepts, principles and problem-solving strategies which researchers showed to have started performing weakly and below expectation as early as 1967 (Chu and Schramm, 1967; Campeau, 1974). As a reaction to which researchers began to explore ways of intervening in the actual process of learning from televised instruction (Clay, 1974; Mills, 1980). One cannot also but mention the influence of the trait-treatment interaction theory to the development and use of multi media packages. The theory explains that there is a connection between personality traits of the learner on one hand and variables of the instructional situation on the other. Hence, learning is influenced by the interaction between the characteristics of the individual learner and specific features of the instructional environment which are either methodical or media specific (Heidit, 1978). This theory seeks to take care of the individual learner and this is also the concern of the multi-media approach to learning. It permits flexibility in the learning situation tailored to the needs of the individual learner.

It is, however, important to note that multi-media packages are not commonly used in Nigerian schools. In the teaching of Social Studies experts had complained about the inadequacy of instructional materials (DuBey, 1980; Farnwang, 1989). But the same cannot be said today with the consciousness of community resources and other materials available for the teaching of Social Studies. Teachers need to be encouraged to use multi-media packages. But first, the potency of such packages for instruction in Social Studies in Nigerian schools today need to be ascertained. This study, therefore, investigated the relative effects of three multi-media instructional packages on Nigerian students' achievement in Social Studies. The packages tested included pictures and the chalk and talk method audiotape, pictures and the chalk and talk method videotape, pictures and the chalk and talk method.

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 the experimental and the control groups.

- There is no significant difference between the pretest mean scores and the achievement mean scores 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 1	--	$O^1 X^1 O^2$
Experimental Group 2	--	$O^3 X^2 O^4$
Experimental Group 3	--	$O^5 X^3 O^6$
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 was the posttest.

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. Their pretest scores were computer-analysed 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. 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 9 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 recording and pictures. The videotape recording 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, e.t.c.

Pilot study: A pilot study was carried out on 120 JSS 2 students randomly selected from one public secondary school to test the workability of the research design and the research materials in a natural setting. The outcome of the pilot study helped to improve and modify the conduct of the study especially with regards to the decision on the qualification and experience of the research assistant who eventually handled the three treatments as well as the decision to train him for the study.

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 three 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.

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 among the subjects, the t-test and Analysis of Covariance (ANCOVA) were used and the hypotheses were tested at 0.05 level of significance. Post-hoc analysis was also carried out where necessary, using the Multiple Classification Analysis (MCA).

RESULTS

Hypothesis 1: There is no significant difference between the achievement mean scores of the experimental and the control groups.

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

As revealed in Table 1, the groups differed significantly in their achievement ($F = 8.818; p < 0.00$). In order to provide some indications of the performance of each group, a Multiple Classification Analysis (MCA) was computed. The results are presented in Table 2.

The MCA (Table 2) shows that E₃ has the highest adjusted posttest mean (17.50), followed by E₂ (16.23) and E₁ (14.83), respectively, with the control group having the lowest (13.70). On the basis of the findings, hypothesis 1 was rejected. There was a significant difference between the achievement mean scores of the experimental and the control groups.

Hypothesis 2: There is no significant difference between the pretest mean scores and the achievement mean scores in each of the experimental and the control groups.

To test this hypothesis the t-test was computed. The results are presented in Table 3.

Table 3 has revealed significant differences for each of the groups showing the calculated t-values as -4.68, -7.33, -8.43 and -3.48 for the E₁, E₂, E₃ and control groups,

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

Source of variation	SS	Df	MS	F-value	p-value
Covariates	2.826	1	2.826	0.228	0.63
Pretest Scores	2.826	1	2.826	0.228	0.63
Main Effects	327.806	3	109.269	8.818	0.00**
Groups	327.806	3	109.269	8.818	0.00
Explained	330.632	4	82.658	6.670	0.00
Residual	1920.743	155	12.392		
Total	2251.375	159	14.160		

** Significant at p < 0.05

Table 2: Multiple classification analysis of achievement mean scores of Subjects in the different groups

Grand mean = 15.56 variable +category	N	Unadjusted		Adjusted for independent + covariate	
		deviation	Eta	Deviation	Beta
Groups:					
V + P C(E ¹)	40	-74		-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					0.14
Multiple R					0.38

Table 3: Summary of t-test on the pretest and the achievement mean scores of subjects in each group

Group	Variable	N	SD	df	T	p-value
V + P + C (E ₁)	Pretest	40	11.50	2.15		
	Achievement	40	14.83	4.02	39	-4.68 0.000**
A + P + C (e ₂)	Pretest	40	11.50	2.48		
	Achievement	40	16.23	3.20	39	-7.33 0.000**
P + C (E ₃)	Pretest	40	11.53	2.25		
	Achievement	40	17.50	3.52	39	-8.43 0.000**
Control	Pretest	40	11.58	2.10		
	Achievement	40	13.70	3.25	39	-3.48 0.001**

** Significant at p < 0.05

respectively. On the basis of these findings, hypothesis 4 was thereby rejected. There was a significant difference between the pretest mean scores and the achievement mean scores in each of the experimental and the control groups.

DISCUSSION

The findings of this study have revealed a significant difference in the achievement mean scores of the experimental and the control groups. Considering the performances of the groups, one could say that the combination of picture and the chalk and talk method is more instrumental to effective leaning than the other combinations. This may, however, sound contrary to normal expectations because many teachers would expect the videotape to make the difference with regards to effectiveness (Smallwood, 1996).

Students in Nigeria are however used to the utilization of pictures in teaching rather than the videotape. Bringing the videotape to the average Nigerian classroom may attract and fascinate learners. But it can also get them so carried away by the reality that they will savour that experience more than they internalize the learning intended for them. Therefore, what they get in such circumstances is what would be regarded as artificial achievement which does not last long. But, with pictures, Nigerian students are most likely to pay attention with the intention to learn and not just to get entertained.

Moreover, the unexpected relatively poor effect of the combination of the videotape, pictures and the chalk and talk method may not be new if one considers the earlier performances of the media strategies which send information through the television or computer screen. This is, however, being discussed considering the fact that videotape and audiotape are the strange components to the experimental groups since pictures and chalk and talk method are constant in the groups. Scholars have reported the insignificant effects of the videotape presentation, educational television and computer-mediated multi-media instruction in the past (Hodge-Hardin, 1995; Rouan, 1995; McDonald, 1996).

The study also revealed that the experimental group using the audiotape combination performed better than the group using the videotape combination. This may be due to the fact that, since the audiotape appeals only to the sense of sound and has no visual treatment, the tendency is for the learner to listen attentively and consciously to it. He will therefore, internalize messages better through the audiotape than the videotape. Images

on the videotape affect attitude positively more than achievement and this is supported by McDonald (1996). It is however, soothing to note that all the experimental groups achieved significantly. Therefore, all the multi-media packages could be recommended to teachers as effective for the teaching of Social Studies in Nigerian Secondary Schools.

CONCLUSION

This study has revealed that all the multi-media packages tested are effective when applied to the learning of Social Studies. It has also revealed that the combination of pictures and the chalk and talk method is the best of them. It is therefore, relevant to say that while hoping that the efforts of the Nigerian government towards ensuring adequate supply of instructional equipment in school will improve and yield necessary results, Social Studies teachers should focus more on improving leaning through the conscious use of combination of available local instructional media as multi-media packages.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made:

- Teachers in Nigeria should always employ the use of multi-media materials, especially the ones tested in this study, to teach Social Studies. This is because they have been found to be effective in inculcating learning in Social Studies.
- The use of videotape presentation in Nigerian schools should be investigated the more with a view to reviewing it. It has been found many times to perform below expectation in imparting learning.
- The Nigerian government should provide adequate local instructional materials in schools and also provide good storage facilities for them. It is when several materials are available that teachers will find it easy using the multi-media approach in teaching and learning.

REFERENCES

Afolabi, E.R.I., P.O. Jegede and B.I. Popoola, 1999. Mandatory computer education in Nigerian secondary schools: Prospects and problems. *J. Edu. Res. Eval.*, 3 (2): 32-38.

Ajiboye, J.O., 1996. Self-learning packages, Lecture and Students' Learning Outcomes in Population Education. Unpublished Ph. D. Thesis, Univeristy of Ibadan.

Aremu, A., 2001. Effects of games on Mathematics achievement of low ability pupils in Nigerian primary schools. *Ibaddan J. Edu. Stud.*, 1 (1): 95-105.

Bandele, S.O., 2001. Ado-Ekiti: Niyi Commercial and Printing Ventures, Computer Science Education. Tertiary Institutions.

Campeau, P.L., 1974. Selective review of the results of research on the use of audiovisual media to teach adults. *AV Commun. Rev.*, 1: 5-40.

Chu, G.C. and W. Schramm, 1967. Learning form Television What the Research Says. Washington: NAEB.

Clay, R.C., 1974. The influence of student participation on learning from ETV. *Visual Education*.

DuBey, D.L., 1980. Problems and issues in teaching the methods of Social Studies in Nigeria in N.E.R.C, Social Studies: Teaching Issues and Problems. Benin: Ethiope Publishing Corporation, pp: 74-80.

Fafunwa, B., 1999. Our agenda for Obasanjo. *Weekend Vanguard*, 11 (195): 6.

Farnwang, W.V., 1989. Instructional materials usage and resource management in Social Studies. *Nig. J. Soc. Stud.*, 1 (1 and 2): 48-55.

Gronlund, N.E., 1976. Measurement and Evaluation in Education. New York: Macmillan Publishers.

Heidt, E.U., 1978. Instructional Media and the Individual Learner. London: Kogan.

Hodge-Hardin, S.L., 1995. Interactive Television in the Classroom: A Comparison of Students' Mathematics Achievement Among Three Instructional Settings. Unpublished Ph.D. Thesis, West Virginia University, U.S.A.

Kadiri, S.A., 1999. The effect of two formats of peer tutoring on students' achievement in Mathematics. *Ife J. Behav. Res.*, 1 (2): 67-71.

Knupp, D.S., 1996. Visual programming instruction using integrated diagrams as a strategy for reducing congntive load. Unpublished Ed. D Dissertation, University of Pittsburgh, U.S.A.

Kolawole, C.O.O. and A. Arikpo, 2001. Status of human and materials resources in public primary schools: Implications for curriculum implementation. *Ibadan J. Edu. Stud.*, 1 (1): 251-260.

Krawchuk, C.A., 1996. Pictorial organizers, navigation and hypermedia: Converging constructivist and cognitive theories. Unpublished Ed. D. Dissertation, West Virginia University, U.S.A.

- Mills, M.C., 1980. The arts: Interdisciplinary design, multi-media format. Aspects of Educational Technology. Ibadan: Y-Books.
- McDonald, M.L., 1996. The impact of multimedia instruction upon student attitude and achievement and relationship with learning styles. Unpublished Ph.D Thesis, The University of Nebraska-Lincoln, U.S.A.
- Omole, D.O.K., 1999. Effect of individualized practical work on student's achievement in secondary school Biology in Ilorin, Nigeria. *Nig. J. Res. Dev. Primary and Secondary Edu.*, 1 (1 and 2): 88-92.
- Rouan, M.M., 1995. The effects of video inserts on college undergraduate's performances and evaluation responses. Ed.D Dissertation, University of San Francisco, U.S.A.
- Seweje, R.O., 2000. The Challenge of Science Teaching in Nigeriatoday. *J. Edu. Foundations Manag.*, 1 (1): 208-220.
- Smallwood, G.F., 1996. Multimedia technology in the classroom: Perceptions of community college academic leaders. Ed.D. Dissertation, The University of Alabama U.S.A.