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INTRODUCTION

The Editorial Board wishes to thank all NASHER members and authors for their contributions towards the success of this 15th edition of NASHERJ. There are improvements over the previous editions and we hope to improve further in subsequent editions.

NASHERJ is published three times (June, September and December) every year. The current edition which is the fifteenth and December Edition has a wide coverage. Accordingly, both empirical and theoretical papers drawn from various fields and institutions nationwide are published. This explains the fact that NASHERJ is making significant contribution to knowledge and a major breakthrough in research and publication. We therefore recommend it to all policy makers, researchers, teachers/lecturers, libraries, students and so on for use.

We are looking forward to receiving feedback from our readers as may be considered helpful. This will help us put in place a very effective, formidable and academically sound and lasting journal.

Dr. E. E. Achor
Editor-in-Chief

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Efficacy of Demonstration Method alone and Combined with Advance Organizer on Students' Achievement in Physical Education

¹U.L. Ezenweani, PhD & ²Awuja-Ademu, S.

¹Department of Science Education. Faculty of Education, Delta State University, Abraka.

²Department of Curriculum Studies and Education Technology, COE, Agbor

Abstract

This study investigates the ability to produce desired results using demonstration alone and combine it with an advance organizer as a method. These are used in teaching physical education to Junior Secondary Students in class three (JSS III) in the Ika South Local Government Area of Delta State. The researchers adopt a pre-test post-test quasi-experimental group control design. The sample consisted of 120 intact class students from selected schools. The instrument used to collect data was the physical education achievement test (PEAT) designed by the investigators. Test-retest reliability was established using Pearson's product-moment correlation coefficient method and 'r' was .67. The data collected for hypothesis testing were analyzed using Analysis of Covariance (ANCOVA) and t-test for two independent variables. The result also reveals no interaction effect between methods and sex on achievement scores in P.E. The finding was that demonstration combined with advance organizers was more efficacious in teaching P.E. as the experimental group (ii) did better than the experimental group (i) and the control group. It was concluded that this approach (demonstration plus advance organizer) proved to be more effective in teaching physical education to improve the student's performance at the JSS III level in this study. As a result, it was recommended that P.E. teachers should follow the principles of advance organizers when planning for demonstration teaching to the students. Hence, it is recommended that P.E. teachers should actively involve students by providing relevant advance organizers to anchor incoming lessons to facilitate the full active participation of students to enhance their performances.

Introduction

Ajala (2002) reports that the way in which Physical Education (PE) is taught in junior secondary schools in Nigeria is rather too poor and leaves much to be desired. Many physical education teachers employ methods which appear effective in achieving the objectives of physical education in secondary schools to them. Physical education is a process of training the mind and body through physical activities (Ekperigin & Uti 1977). Such training should keep the mind busy and body active at all times the process is on. The mind should be sound so that physical activities would continue throughout one's life. Physical education teachers need to encourage students' full active participation in their class activities.

On the contrary, the physical education teachers exhibit poor preparation of lessons resulting in poor implementation of the subject curriculum in the secondary schools. Some teachers who tried to use the demonstration method as recommended in the curriculum never or rarely employ students' activities in teaching (Awuja, 2005). Demonstrations in physical education classes is therefore turned into "singing" and "dancing" episodes by physical educators (Onuigbo, 2005). There is inadequate provision of facilities, equipment and materials that are supposed to facilitate the proper execution of a particular skill leading to increased participation by students. It is also alleged that some teachers engage students in note copying instead of physical demonstration of skills or activities which is expected to dominate their teaching schedule in the classrooms.

As a necessity, effective teaching and learning of physical education involve the full active participation of students at any level. The demonstration method as recommended enables the teacher to show students how to do things systematically so that students can emulate or imitate their teacher in acquiring the skills (Ajala, 2002). The demonstration approach is also employed by the teacher especially when materials are in short supply or poisonous or too delicate for students to

handle alone. For such reasons, the physical educator demonstrates before the entire class member or with aid of a few selected students or uses a student who is knowledgeable about the topic (Awuja-Ademu, 2008). The advance organizer on the other hand describes a body of information about a topic presented ahead of time to serve as an anchor and template between incoming information and existing knowledge (Ausubel, 1960). It was used by Ausubel to improve the expository method and in this study, the researchers adopt it to enhance the demonstration method so that students can fully participate in physical education lessons. Effective utilization of demonstration combined together with the advance organizers is capable of bridging the 'gap' between teacher centeredness and students' inactive' participation which has led to low achievement in recent times. There is a need for functional physical education aimed at promoting progressive united Nigerians. An appropriate instructional method is a vehicle through which the goals and aspirations may be realized.

Statement of the problem

Physical education is an examinable subject at the JSS III certificate level (FRN, 2004). Students' achievement so far is below expectation. The very essence of teaching physical education cannot be achieved without the use of practical methods such as demonstration and use of advance organizers during instruction. It is surprising to observe that physical education students' performance at JSS III Certificate examinations in Delta State tends to be very low in recent times. The situation has persisted and perhaps deteriorated to the extent that the efficacy of instructional methods used by teachers is in doubt. The questions are: (1) Can the efficacy of the following methods (demonstration or demonstration combined with advance organizer) be established? (2) Which of the methods is more efficacious in teaching physical education in JSS III in Delta State?

Research Question

Based on the introductory background and stated problems, the following research questions emerged.

1. What is the efficacy of the demonstration method in teaching PE at the JSS level in Delta State?
2. Will there be a difference in students' achievement in P.E between the demonstrations method used alone and when combined with an advance organizer?

Hypotheses

The following null hypotheses have been formulated for testing in this study

Ho₁: There is no statistically significant difference in the achievement mean scores of students exposed to demonstration, demonstration combined with advance organizers and control group in physical education.

Ho₂: There is no Significance interaction effect of instructional methods and sex on the achievement mean scores in physical education.

Research Method

This study adopts a pretest post-test quasi-experimental non-equivalent control group design. This is because there is a nonrandom selection of students in the group. Again, the classes exist as intact groups which the school authorities hardly permit the classes to be disorganized and reconstituted for research purposes (Fraenkel & Wallen, 2008). The design allows manipulation, control and pairwise comparison within the varying sources involved in the study. Three schools were randomly selected out of fifteen public JSS II in the Ika South Local Government Area of Delta State. Treatment was categorized into experimental group I exposed to demonstration alone while experimental group II was exposed to demonstration combined with advance organizer and control group exposed to any other teacher's choice of any method. The sample consisted of 120 subjects from intact classes. One of the reasons for the choice of the JSS III class was because they have a uniform Government approved syllabus as well as qualified experienced P.E. teachers. The principals accepted the use of JSS III classes. The schools had adequate facilities.

Physical education achievement test (PEAT) was designed by the researchers using past junior school certificate examinations (JSCE) question papers between 2005 and 2008 academic

sessions which were validated by some experts in measurement and evaluation plus science education experts who after scrutinizing it certified the instrument (PEAT) to be valid

Development of Research Instrument

Two teaching instruments were prepared in form of lesson notes according to each of the treatment groups. There was no lesson note prepared for the control group but the same selected topics were taught during the period. The researchers designed the lesson notes based on the selected topics from the JSS III syllabus. The groups were categorized into three; namely demonstration, demonstration combined with advance organizers methods and control group. Below is the table of specifications for the physical education achievement test (PEAT) specifying topics selected from the syllabus (contents).

Table 1: Table of specifications for physical education achievement test for JSS III in Ika South L.G.A. Of Delta State

Objectives/ syllabus	Knowledge 35%	Comprehension 30%	Thinking 25%	Total
Ball games 20%	4	4	2	10
Track events 20%	2	2	2	6
Field event 20%	3	3	2	8
Gymnastics 15%	3	3	2	8
Simple games type activities 10%	1	1	1	3
Fundamental movement 15%	2	2	1	5
Total	15	15	10	40

A total of six topics selected from the PE government-approved syllabus was taught under six weeks of treatment. Topics 1, 2 and 3 had 20% each while topics 4 and 6 had 15% each. Topic 5 had 10% of the items. The Table shows areas of concentration for the treatment packaged based on the knowledge, comprehension and thinking in accordance with the educational testing service (ETS). The 20 multiple-choice items were selected from the past P.E. Junior school certificate examination (JSCE) between the 2005 and 2008 academic sessions. These past questions were prejudged to be valid. Besides, the researchers sent these past questions to two experts in measurement and evaluation who validated them and made suggestions for improvement.

Subjects were instructed to write down only one correct answer in the space provided. Out of the four multiple-choice items (1-20), only one answer is correct. A student can score a maximum of 20 marks or a minimum of zero. Each item carries one mark. A week was set aside for the training of the research assistants on how to use the lesson notes as packaged by the researchers. One different lesson note was packaged for demonstration alone and another for demonstration combined with advance organizers separately while the control group was taught with the conventional method.

Prior to the treatment, a pretest was conducted for both experimental treatment and non-treatment groups respectively. The trained research assistants were physical education teachers who hold at least NCE with a minimum of 5 years post qualification teaching experience. The treatment period lasted for six weeks and each of the three groups spent 30 minutes per lesson during the administration of the treatment but the control group did not use the conventional method. The researchers concealed the post-test till after the experimental treatment. All the groups were post-tested. The initial pretest scores for all students in treated and non-treated groups were used as a covariate during analyses to neutralize the differences among the groups at the commencement of the research. Similarly, the practice effect and reactivity to testing in the study were neutralized through the use of a control group.

Reliability of the instrument (PEAT) was established through test-retest reliability by administering the test to 20 subjects outside the designated area of this study. Two weeks after the initial test administration, the same instrument (PEAT) was administered to the same group of subjects. The two data collected were analyzed using Pearson's product-moment correlation coefficient method. The 'r' was .67 at .05 level of significant.

The initial point of data collection was a pretest conducted immediately after the training of the research assistants within the three co-operating school locations in Ika South L.G. A. Of Delta State. After six weeks of treatments, a post-test was carried out in order to collect data used for analysis in this study.

The study adopts an analysis of covariance and t-test for two independent variables. The T-test is used to determine the significant difference between two sets of variables that are independent while ANCOVA statistics was chosen because it is robust in analyzing the effect of two or more independent variables on a dependent variable. ANCOVA reduces error variance occurring in the analysis.

Result

Table 1

Mean and standard deviation for pretest and post-test scores according to treatment and non-treatment groups.

Treatment	Group	Pretest	Posttest	Mean gained
Demonstration alone	Mean	15.17	25.21	10.28
	Std. Deviation	2.53	6.95	
Demonstration + advance organizer	Mean	15.08	34.24	18.28
	Std. Deviation	3.58	10.64	
Control group	Mean	14.25	20.64	6.65
	Std. Deviation	3.02	5.58	

Table one reveals the pretest and post-test mean scores of subjects in accordance with their respective experimental treatment groups. The group taught using demonstration combined with advance organizers had the highest mean score of 34.24 plus a mean gained of 18.28 while the demonstration method alone is next to it with the mean score of 25.21 and a gain in the mean is 10.28. The control group had the least mean score of 20.64 and a gain in the mean of 6.65. These findings show that the users of advance organizers achieved more than non-users. Thus, hypothesis one which states that there is no statistically significant difference in the achievement mean scores of students exposed to demonstration, demonstration combined with advance organizers and control group in P.E. is rejected and the alternative hypothesis is retained.

Table 2

ANCOVA summary table for interaction effect of instructional methods and sex on the achievement mean scores in physical education

Source of variance	Sum of square	Df	Mean of square	F	Significance
Covariates	2554.774	1	2554.774	42.712	00
Pre-test	2554.774	1	2554.774	42.712	00
Mean effects	4406.366	3	1469.545	24.567	00
Experimental Treatment	4367.954	2	2184.476	36.531	00
Sex	48.804	1	48.804	803	36ns
2- way interaction	273.004	2	136.502	2.282	10ns
Treatment * sex	272.129	2	135.560	2.262	10ns
Explained	7236.138	5	1205.032	20.136	00
Residues	8553.345	134	59.184		
Total	19788.349	194	105.79		

The ANCOVA summary Table two shows the calculated F value for the interaction effect of instructional methods and sex on the achievement ($F_2 = 2.26$, $P < .05$). The calculated F value is less than the F critical value of 3.04. Therefore, the null hypothesis two which states that there is no significant interaction effect of instructional methods and sex on achievement mean scores in physical education are hereby retained. This means that there is no significant interaction effect between methods and sex on achievement in P.E. equally, there is no significant difference between the achievement of male and female students.

Discussion

The finding from testing hypothesis one Table 2 shows that there is a statistical significant difference in the achievement mean scores of students exposed to demonstration, demonstration combined with advance organizers and control group generally. In the first instance, both experimental treatment and non-treatment groups improved in their pre-test performances. The implication is that they did better in their post-test. Secondly, subjects who were exposed to demonstration combined with advance organizers had the highest mean gain scores of 18.28, followed by the demonstration method alone with the mean gain scores of 10.28 and lastly, the control group with a mean gain score of 6.65. The outstanding performance of students taught using demonstration combined with advance organizers might be attributed to the sensitivity of the students to the utilization of advance organizers to facilitate or enhance the demonstration methods by physical educators. This means that students who were actively involved when advance organizers were combined with the demonstration method improved their results tremendously. This result corroborates the findings of Akpochafo (2001); Ojeifo (2000) and Ajaja (1996) who in their separate independent studies attributed the difference in the achievement mean gain scores to the effect of the advance organizer respectively. Similarly, Ademola (2008); Onyeagwu and Ijeh (2006) report significant differences in achievement particularly in science and mathematics when the demonstration is combined with advance organizers.

Umeoduagu (1995) finds significant interaction effects of instructional methods and sex on students' achievement in Integrated Science. Researchers like Onwuegbu (1998) and Akpochafo (2001) report the interaction effect of instructional treatment and school location on students' achievement. The findings in this study support some of the results of previous studies as cited above. It also implies that methods of instruction cannot be influenced by sex differences on the achievement mean gain scores in physical education in Ika South Local Government Area of Delta State.

Conclusion and Recommendations

Arising from the findings in this study, it could be concluded that augmenting the demonstration method with an advance organizers is more efficacious in the teaching of physical education than demonstration alone. It can also be concluded that there is no interaction effect between instructional methods and sex on students' achievement mean scores in physical education.

Consequently, it is recommended that physical education teachers should fully involve students by providing relevant advance organizers to anchor incoming lessons and facilitate the active participation of students in physical activities. Curriculum designers, implementers and supervisory agents from the ministry of education should incorporate these findings into the pre-service teacher training programmes in physical education to help improve students' academic performances. Similarly, the state ministry of education in conjunction with the principals of JSS as a matter of necessity should organize periodic workshops, seminars and conferences for serving physical educators on how to combine demonstration methods with advance organizers to improve P.E. students' achievement mean scores.

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