
EFFECTS OF CREATIVE DRAMA - BASED INSTRUCTION ON BASIC SCIENCE ACHIEVEMENT AND SCIENTIFIC ATTITUDES IN LAGOS STATE.

BY

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ABSTRACT

This study investigated the effects of creative drama based instruction on Basic Science Achievement and Attitudinal change of science students in Lagos state. A pretest- posttest experimental control group designed was used. Four null hypotheses were postulated out of which two were rejected while two were retained. There were two groups. The experimental and control groups. Treatment was given to the experimental group using Activity Based Instruction in addition to Creative Drama Based Instruction for three weeks while the control group was taught using the normal Activity Based Instruction. The data collected was analyzed using percentages and tables while the hypotheses were analyzed using t-test. The result of the analysis revealed that subjects in the experimental group performed better than those in the control group in terms of academic achievement and positive attitudinal change. It was also revealed that there was no significant difference in academic achievement and attitudinal change between male and female when exposed to creative drama based instruction. On the basis of the findings, it was recommended that creative drama based instruction be combined with other science teaching strategies in order to enhance meaningful learning of science concepts.

Key words: Creative drama, science process, improvisation

INTRODUCTION

The major goal of science education is to inculcate scientific literacy that leads to the acquisition of higher level thinking and problem solving skills. Science teachers and scientists argued that the main reason for school science is to increase and maintain a pool of scientist and citizens who pursue science related careers, while philosophers and educators asserted that science teaching should build a more scientifically literate society (Bagci-kihe, 2003). The science education reform of the late 1950s and 1960s influenced by scientists shifted the fulcrum of science education by aiming to turn all students into future scientist and by teaching science through hands-on-activity and inquiry methods. (varrella

2000, Vager 2000) According to Colburn (2000) many science educators and philosophers of science believed that learning science is an active process of building one's own models. Therefore the epistemological theory that knowledge is actively created within the learner is called constructivism. In the constructivist approach, science is viewed as a continuous process of inquiry through which models of natural phenomenal are developed in ways that will help explain our experiential world (Carin 1997; Colburn 2000). In those models, prior knowledge, experience and information influence learning. Instead of the students talking about scientific "truth" in terms of how knowledge corresponds with reality, constructivist talk about the usefulness, viability and

coherence of scientific knowledge and consensus of the members of the scientific community.

Runco (2007) asserts that conceptual learning occurs when learners make their own sense out of such knowledge. This implies that students should be able to reflect on whatever they have learnt. One of the ways by which this can be done is through creativity and hands-on-activities.

Several studies have shown that many science teachers today still do not teach science through hands-on-activities (Carin 1997, Goga and Peters 1998 and James 2000). Students are not challenged to engage in conceptual change and critical thinking activities especially in science subjects. Science is still taught in teacher dominated classrooms using teaching methods that do not consider students cognitive developmental stages, learning styles or multiple intelligences (Weld 2000; and Goodnough 2001). The researchers are of the view that one of the ways by which science students can be engaged in critical thinking and problem solving is through the introduction of creative drama based instruction especially at the Basic Educational levels of our educational system. According to Duatepe and Ubuz (2004), the use of creative drama is very popular in Arts subjects especially in social studies. However such methods are not commonly utilized by science teachers, although a few reports exist on the use of creative drama activities in science teaching (Bolen 1994; Kimbrough, Dykes and Mlady, 1995, Rivera and Banbury 1994).

What is creative Drama?

According to Meyers (2004) creative drama can be described as a method of teaching and learning that involves students in spontaneous and unscripted learning. Bracha (2007) sees creative drama as a multi-dimension art, designed especially for educational purposes. It is a form of imaginative play, facilitated by a leader which involves an improvisational group process. Creative drama strategy of teaching is also a constructivist approach

to learning. This is because students are encouraged to construct new knowledge which is categorized as a constructivist teaching method. Vygotsky (1978) asserts that social constructivism sees knowledge as a product of social interaction mediated by activities and cultural tools such as language. Creative drama is usually created on the spot and it is not usually scripted nor memorized. (Bailey 1993).

Many studies have confirmed that creative drama strategy had improved academic performance of students in different fields such as science, mathematics, life knowledge, linguistics and psychology to mention but few (Kaf, 1999, Yilma, 2000; Duafepe and Ubuz 2004) Saricoban 2004; Ogur and Kih 2005).

Furthermore, drama educators report that creative drama techniques are useful, helpful and effective in many curriculum areas including science (Kase-polisni and Spector 1992, and Bailey 1993). Similarities exist between science and creative, drama processes. This is because in both processes according to McCaslin (1996) students are actively involved, they solve problems, ask questions, learn through inquiry and construct knowledge built on prior experience and information. When creative drama is integrated into science teaching, it assist students in developing scientific skills as well as affective skills such as cooperative work, empathy, communication, listening and reflective reasoning.

Scientific process skills contain not only the skills encountered in the science areas, but also the skills we face in many areas in our daily life. Scientific process skills involve what scientist do in the course of carrying out investigation about the natural phenomenal. Scientific process skills include observation, classification, formulation hypotheses, conducting experiments meaning and conclusion to mention but few. Since scientific process s skills are used to construct knowledge, it therefore means with the use of scientific process skills, the primitive forms of what scientist do could also be taught in elementary years to teach children to construct their own

knowledge. This study therefore attempted to examine the efficacy of creative drama based instruction in science teaching and development of scientific attitudes at the basic school levels.

Research Hypotheses

- There is no significant difference in post-test achievement scores between basic science students taught with creative drama based instruction and those taught with only activity based instruction.
- There is no significant differences in post-test attitudinal scores between basic science students taught with creative drama based instruction and those taught with only activity based instruction.
- There is no significant difference in post-test achievement scores between gender when taught using creative drama based instruction and those taught using activity based instruction.
- There is no significant difference in post-test attitudinal scores between gender when taught using creative drama based instruction and those taught using activity based instruction.

METHODOLOGY

This study used a pre-test, post-test control group design (Campbell and Stanley 1993). The population was made up of all the public junior secondary schools (Basic class) in Ikorodu Metropolis of Ikorodu Local Government area of Lagos State totaling 23 schools. Two public junior secondary schools were randomly selected for the study using balloting system. The two schools were: Ayanbure junior grammar school and Ipakodo junior high school Ikorodu. Both schools were equal in terms of academic level, environment and they were about three kilometres away from each other. Intact class was used and one of the schools was tagged experimental group (n=29) while the other school was

tagged the control group (n=50). Both schools were co-educational schools made up of both male and female students.

Instrumentation

Two major instruments were used in this study. These were Achievement Test in Science (ATS) and Attitudinal Questionnaire in Science (AQS). The ATS is made up of Twenty Multiple choice questions drawn from the syllabus of Basic Science II on the topic - **characteristics and caste system in Termites**. The AQS is made up of twenty item attitudinal statement which tends to ask the subjects about their attitudes towards science before and after the teaching.

The questionnaire used a four point likert scale of Strongly Agreed (AS) Agreed (A) Disagreed (D) and Strongly Disagreed (SD). The two instruments were validated by three different senior lecturers in science education at the National Open University of Nigeria Lagos. ATS, AQS and the lesson plans for the experimental group were validated and the correction and suggestions made by the validators were used to improve the instruments before administration. Cronbach's alpha coefficient for the ATS was 0.68 while that of AQS was 0.71.

Treatment

The two instruments (ATS and AQS) were administered to both groups before the commencement of the treatment. Treatment was performed on the experimental group using the normal activity based instruction after which the subjects performed a creative drama based on the topic taught. The control group was taught using only the normal activity based instruction without drama demonstration.

The whole exercise lasted for three weeks of two lessons per week and one of the authors handled the experimental group while the other one handled the control group. The lessons taught to the

experimental group were based on the validated lesson plan using creative drama based instruction.

Creative Drama Based Instruction

The main topic used for this study was characteristics and caste system in termites. This topic was broken down to six sub-topics to cover the six lessons for three weeks. The lessons for the experimental group involve teaching the students with the normal class activity strategy but in addition the students were asked to dramatize the concept which they have learnt which require them to act as if the concept taught was real. There was no scripting of memorization of any form. One lesson lasted for 40 minutes twice in a week for three weeks. The control group was taught concurrently with the experimental

group. The control group was taught using the normal class activity method but without dramatizing. At the end of the treatment a post test and attitudinal questionnaire were administered to both groups.

FINDINGS AND DISCUSSION

The data analyzed include the pre and posttest and the attitudinal questionnaire for both the experimental and the control groups.

Hypothesis 1

- There is no significant difference in posttest Achievement scores between basic science students taught with creative drama-based instruction and those taught with only activity based instruction.

Table 1 t-test of students' posttest Achievement scores by treatment and Attitudinal towards Basic sciences

Treatment	N	Mean	Std Deviation	Std error	t	df	p
(Achievement) Experimental	29	23.31	5.252	.975	4.297	77	.000
Control	50	19.46	2.720	.385			
(Attitudes) Experimental	29	83.69	5.392	1.001	6.314	77	.000
Control	50	72.80	8.318	1.176			

From table 1 above, the mean achievement score of the experimental group was 23.31 while that of the control group was 19.46. This implies that the experimental group performed better than the control group. The table also reveals that there exists a significant difference in posttest score ($t(77) = 4.297$; $P < 0.05$). Therefore hypothesis one is rejected.

Hypothesis 2

- There is no significant difference in posttest attitudinal scores between basic science students taught with creative drama based instruction and those taught with only activity based instruction.

Again Table one above shows that student exposed to creative drama based instruction (i.e. experimental) had higher favorable mean attitude scores of 83.69 than those that were not exposed with a mean of 72.80. Also the t-value of 6.314 at 77 degree of freedom indicates that there was a significant difference in posttest attitude scores ($P < 0.05$), therefore hypothesis two was also rejected.

Hypothesis 3

- There is no significant difference in posttest achievement scores between gender when taught using creative drama based instruction and those taught using only activity based instruction

Table 2 t-test of student's Posttest Achievement score by gender and Attitudinal Scores

Gender	N	Mean	std	std	t	df	P
(Achievement) Male	35	21.49	3.921	.663	1.145	77	.256(ns)
(Achievement) Female	44	20.39	4.473	.675			
(Attitude) Male	35	78.23	8.872	1.500	1.259	77	.212(ns)
(Attitude) Female	44	75.66	9.119	1.375			

Table two shows that male student's posttest mean score was 21.49 as against the female students' posttest mean score of 20.39. The difference in these posttest mean scores is not significant ($t(77) = 1.145$, $P > 0.05$) therefore hypothesis three is retained

Hypothesis 4

- There is no significant difference in posttest Attitudinal scores between gender when taught using creative drama based instruction and those taught using activity based instruction

From table two above, it can be deduced that male students attitudinal posttest means score was 78.23 while that of female students was 75.66. Attitude of male students was more favorable than that of female students after treatment was applied. The t-value of 1.259 shows no significant difference in male and female post-attitude scores since P-value of .212 was higher than 0.05 significant levels. Therefore hypothesis four which states that there is no significant difference between male and female in terms of posttest attitudinal scores was retained.

DISCUSSION OF FINDINGS

The analysis in table one indicates that students taught with creative drama based instruction performed better than those taught with only the normal activity based instructions in terms of academic Achievement. It was also discovered that the students in the experimental group also developed positive attitudinal change towards learning of science

after the treatment. This finding agreed with that of Bailey (1993) who concluded from his study that creative drama combined with science method of teaching can enhance meaningful learning of science concepts.

This findings also concord with that of McCaslin; (1996), Karuonen-Lee (1997) and Colburn (2000) who separately concluded that creative drama is a vehicle for exploring values and feelings in students by re-enacting their various characters and their behaviours.

Furthermore the results of findings in table two revealed that there was no significant difference in gender in terms of the achievement and attitudes towards the use of creative drama based instruction. This is an indication of non-existence of gender stereotype in teaching and learning of science using creative drama based instruction. This findings contradicts the general belief that there is gender inequality in terms of academic achievement in science subjects (Hazari, Tai, and Sadler, 2007; Society for Women Engineers 2008). This finding was at variance with the opinion of Ingels and Dalton (2008) on gender inequality who opined that teachers pay more attention to boys than girls in the science classroom which resulted in the poor attitude and academic performance of girl-child in science subjects. This was corroborated by findings from Dalton, Ingels, Dovening and Bozick (2007).

RECOMMENDATION

On the basis of the above findings the following recommendations are made

- Science teachers generally should use other instructional strategies combined with creative drama in teaching science especially at the elementary school level.

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