

The Integration Of Creative Drama Into The Teaching Of Radioactivity: A Case Study Of Mwashii Secondary School In Kabwe District

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Abstract: The integration of creative drama into the teaching of radioactivity concepts in physics was analyzed. The study also determined the reaction teachers and students made towards creative drama activities in the teaching and learning of physics. One group was taught with creative drama and the other group with traditional lecture methods. The analysis showed that incorporation of creative drama helped in understanding difficult concepts in physics but requires more time to implement.

Keywords: Creative drama, Roleplay, Traditional method, Achievement

1. Introduction

The use of creative drama has proved to be important because it enriches and makes learners become imaginative and have a will to act or pretend as a way of improving in their academic performance, improve in their emotions, and improve in their interpersonal goals (Froese, 1996). The creative drama has been used to teach subjects like literature in English, Religious studies just to mention a few. The creative drama has not been used much in science specifically physics. Karakelle (2009) points out that the use of drama makes students get exposed, it makes a provocation in their thinking patterns to become curious, driving towards discovering new knowledge and making them further their learning chance or opportunities in education. Hence the integration of creative drama can make learners become proactive in the teaching and learning of physics. Most of the learners perceive physics as the toughest subject to understand and this can be attributed to the way physics is taught. Kay (2010) recommended that colleges and universities should add and increase the training periods on how to integrate and use creative drama in their lesson, making it fun as a child-centered strategy when teaching. Strategies that are used by teachers are just too traditional and may not be sufficient to make learners understand the content because teachers tend to use methods are not provocative. They mostly use lecturing and discussion methods which makes learners be passive and they don't even make the minds of the learner to be active. Methods that are supposed to be used should lead to learners have minds of the problem-solving. McCaslin (2006) stressed that the new education and creative drama have common goals and aims which some are aesthetic and creative development, having the ability to creative and critical thinking, communication skill improvement in moral and spiritual codes, and self-acknowledgment. Creative drama is made up of all activities that are directed in

improving children's creativity. Participants in creative drama activities are helped to become creative thinkers, inventiveness and actually become curious about everything and they would want to know. Creative drama makes learners have a sense of asking questions, and analyze their self-consciousness and they become so imaginative.

1.1 The Learning and Teaching of Science

The learning and teaching of science are known to be a proactive process. Learners and teachers need to be collaborating at all times in the learning and teaching process. Most educationists of science and philosophers stressed the point that learning of science is a proactive process of constructing one's own model. This building or creating knowledge within the student is what is known as constructivism. All science concepts are constructed by a human and are not process objectively hence they can be subjected to critical interpretation (Novak, 1983).

1.2 The Way Science is Taught Currently

The way educators or teachers teach science is criticized by many researchers. Science is a dynamic subject and the way it is taught should be dynamic. The teaching of science has not changed much in the last 50 years (Dass, 2000; Goodnough, 2001). The way science is taught is still based on facts only and most teachers simply rush through the content just to complete the syllabus for examination purposes. The teachers do not even consider the understanding of concepts by learners and alternative assessments (Kamen, 1996; Penick, 2000; Goodnough, 2001). The way science is taught because of focusing on examination, the teaching is now fact-orientated. The main method used is the lecture method which could also be called 'pen-and-paper' method (Dass, 2000; Veronesi, 2000; Goodnough, 2001). In order to change the mentality of teachers with new methods of teaching, teacher professional

development has to be enhanced. This could help teachers become connected to current science reforms. Continuous Professional Development has to be promoted very much so that whatever things that emanate everyone is kept abreast with them. In Zambia there we have Zambia Association for Science Education (ZASE) which tries, by all means, to keep science teachers in the country to acquaint themselves with new scientific discoveries that are taking place and encourage them to be innovative through National Science Centre (NSC). Workshops and conference are held starting from zonal level, district level, provincial and national level throughout the year in order to discuss how effectively science can be taught and how academic performance in schools can be improved.

1.3 Instruction of Science-Based on Research

There must be an effective way of teaching science. Our teachers in Zambia has to change teaching strategies in order to be engaging more students in science and other related science subjects such as mathematics and geography. The methods used have to be appealing and they should be triggering interest to learners. For better achievement for the goals of having a scientific world, science teaching must involve learners to be active in creating their own conceptual understanding and knowledge (Dass, 2000; Varrella, 2000). Bracha (2007) stresses the point that science has to be taught in such a way that it enriches students with the 21st-century skills such as critical thinking, creative thinking, problem –solving, effective communication, collaboration, and many more others. Learners are supposed to question, critically analyze the natural happenings and has to be responsible for the decisions they make

1.4 Educational Arts

Arts in education is very important as it makes educational activities being spiced. Arts in education has been there way back in times of the first philosophers and the early educationist. For years and years, the play has been seen as showing or exposing children's potentiality (Cohen, 1987). Art is all about imagination, children tend to imagine things more than adults because adults as they grow, they usually stop playing and imagination ceased. In the early stages of learning, teachers consider playing as the most important component of young children learning the process. Play enables learners to be free in their learning and freeing their potential (McCaslin, 1984). Learners, learn well when they are in an environment which is not restricting them. Learners become bored every time just to be in class doing the same routines. Play in learners is very cardinal as it enables teachers to collect data through observation of how each child behaves. In this way, teachers enable to assess the interaction of learners to each other also as an individual and to see if the child is social. It is through social interaction where children get to understand some concepts of learning adequately. Teachers are also important in making sure that learners do play (Bailey, 1993).

1.5 Creative Drama

Creative drama in our education sector is very important and teachers do not realize its importance. In the past, rote learning was the major strategy they used. Creative drama emanated from the Progressive Education Movement (PEM) which was staged by Francis Parker. When the movement grew big, John Dewey and Marietta Piece were the new thinking leaders in education. Dewey suggested that creative drama should be used in teaching knowledge, skills, values, and morals to learners and emphasized the shift from teacher-centered education to learner-centered education. Bayraktar and Okvuran (2012) researched on the utilization of creative drama and their findings were that learners get motivated, they develop self-reflection and creative thinking skills, which can enhance the skill of writing as an important aspect of education. With another line of thought, Partab (2012) stressed that the core value of creative drama in education is that it provides edutainment and psychological support, reducing student's anxiety. Moreover, he further stressed that creative drama can help in community awareness, providing greater comprehension of learners' problems. Sengul (2016) also investigated and found that creative drama activities could positively influence pupils' skills acquisition; in particular fueling self-expression and self-confidence. Creative drama is a type of play which provokes creativity, critical thinking and imagination. The teacher or facilitator is at the center of it all as he /she should know and structure the play in three phases as how the play should begin, the middle or climax of the play and the conclusion. Creative drama as the name suggests it is all about creativity and the use of improvisation. It is not written or memorized but it is done on spot. What is acted is as a result of spontaneous reaction and thoughts of the participants (McCaslin, 1996). Learners do act on what they have learned before or what they are learning or what they will learn. Froese (1996) and Zaghoul (2018) says that the use of creative drama empowers the student's imagination and willingness to perform as a means of reinforcing academic emotional, and interpersonal objectives. When learners are acting there is imagination at its highest level in order to depict the scenario of what they are performing. The use of creative drama is very beneficial, usually, learners that are often shy, quiet, passive, lack concentration, or seem to have been troubled, "wake up" or "come to life" when they have the freedom to use their senses and imagination (Paul, 2017). When learners are exposed to creative drama, it triggers a change in the thinking pattern, curiosity becomes high, and it directs them to new discoveries and prompts them for future learning opportunity (Karakelle, 2009; Zaghoul, 2018). Çokadar and Yilmaz (2010) investigated the use of creative drama and in their discoveries, they found that when learners participate, interacts, the harmony which emanates from creative drama process greatly makes science student's understanding of the environmental concept and positively directs them to develop their learning. Usually, educators get surprised to hear the vocabulary which learners acquire and the knowledge they expose which is not shared when they learn through traditional methods.

1.6 Educational Benefits of Creative Drama in Science

The imperativeness of creative drama lies in the power of it being a stimulant. The recent recognition of imagination has been highly rated as “the magic force that goes beyond the mastery of facts and techniques in the search for new ideas.” (McCaslin, 1996, p.22). Mainly some 21st century skills such as creative thinking and creative thinking and others are as a result of creative drama. Naturally, critical thinking activities are open-ended hence they provide ways and means of defining a problem, developing a solution to the problem and also to be given the feedback (Steinert, 1993). The use of creative drama in science teaching enhances student’s communication skills benefitting group discussion and eliminating shyness (Aydeniz & Ozcelik, 2012). When shyness is eliminated learners through creative drama, they create an opportunity to express themselves clearly and by this their academic achievement levels are improved. Aykac’s (2013) contributed to the fact that creative drama actually improves learner’s ability to express themselves, observing that it empowers them with self-confidence by having a capacity to communicate effectively and therefore creating an inner satisfaction within an individual. With creative drama, students are let to be creative with their own reality and are given morale to express themselves freely in the classroom (Najami et’ al, 2019). The creative drama also reviews and assess the level of understanding of concepts by both teachers and learners (McCaslin, 1996; Rubin & Merrion, 1996). When learners are physically involved in the learning and teaching process using creative drama, their attention is captured and motivation in them is increased (Ladrousse, 1989).

2. Background of the Problem

Looking at the reports by the Examination Council of Zambia (ECZ 2014), it plainly showed that there is a problem in which physics is taught in schools. Candidates performed better in the topics measurements, motion, energy, work, power, light, wave motion, sound, and electricity. In the topics mass, weight, forces and thermal physics, the candidates’ performance was medium. The performance was low in radioactivity, electromagnetism, and introduction to electronics (ECZ 2014). The methods that have been used in teaching physics has been too traditional hence not enhancing learner’s acquisition of knowledge, skills, and values. This has led to too many students failing in the topic of radioactivity.

3. Theoretical Frame Work

This study was based on constructivism. Constructivism is the process of synthesizing knowledge or it is the study of knowledge (epistemology) that human being come up due to interaction with other fellow human being or the environment. Interaction is very important in someone’s life. Through interaction, we learn a lot of new things which we don’t know. Other people teach us the thing that we may not know through sharing ideas and knowledge. Also through interaction with the environment, we may discover something new which should help us become more knowledgeable. Piaget is believed to have coined the theory

of constructivism. A valid and strong restriction in education is that teachers are not supposed to be just offloading knowledge to learners but learners have to be actively engaged in the construction of knowledge in their minds (Olusegun 2015). This means that teachers should not be just imparting knowledge to students where they are not involved. Learners need to be active by fully participating and not being passive in the learning process. Passiveness may not lead students to gain the much-needed knowledge adequately as they may forget easily but when they are actively involved they may keep the information by fully understanding the processes in which the knowledge or content is all about. Mayer (2004) says that not all teaching strategies are effective when you use constructivism approach and it is also not effective for learners. Many teachers misuse constructivism as it is done in order to keep learners behaviorally active. It is described that constructivism is misused as “constructivist teaching fallacy”. The reference to this analysis as the “constructivist teaching fallacy active teaching always leads to active learning and vice versa.” (Mayer, 2004 p.15). In this case, Mayer points out that students must be ‘cognitively active’ and teachers must use “guided teaching” during the teaching and learning process.

4. Method

Research aim and question

This paper discussed the integration of creative drama into the teaching of radioactivity concept and its intention was to answer the research questions which are:

1. Do the integration of creative drama activities in physics instruction enhance students’ understanding of radioactivity concepts in grade twelve (12) at Mwashii secondary school?
2. How do students in grade twelve and teachers react to creative drama in physics at Mwashii secondary school?

4.1 Setting

The study took place in Kabwe district at Mwashii secondary school with a population of 2000. Mwashii secondary school is a newly upgraded school which has two sections, primary and secondary section. The primary section runs from Nursery (reception), grade 3 to 7 and it is phasing out slowly also it has a special unit. The primary school has a total of 1,055 pupils. The secondary section starts from grade 8 to 12 with three streams each with an exception of grade twelve which has two. The secondary section has a total of 945 students. The school is located near Paglory University, so it is considered for teaching practices by most students from this university. The school does service some students from Immaculate Visitation College, and Kwame Nkrumah University. Students from these institutions come to do their teaching practices at this school in order to have the experience needed for someone to be a teacher.

4.2 Population

Two classes of the grade twelve (12) classes participated in this study. The group composed of 50 students that received

creative drama treatment. And the other class of 45 did not participate in the receiving of creative drama.

4.3 Research Design

This study used an action research case study approach. This was exploratory action research because it wanted to explore the effectiveness of integrating creative in the teaching of physics. Few studies have been done on the integration of creative drama in the teaching of physics using creative drama. This study used an action research approach because it took a view of improving the teaching strategies with an improved creative drama strategy. Action research has become a popular approach in problem- solving among most educators as it deals with real human beings.

Table 4.1 Pre-Test –Post-Test Control Group Design

Group A	L	I	O	I
Group B	L	I	-	I

“O” represents the experimental group or group with intervention, “I” represents Physics Achievement Test, and “L” represents a random assignment.

4.2 Educational intervention

This study was done within 4 months. Radioactivity was chosen as the topic of study. This was taught in 2 class meetings, and it was spaced within the first six weeks of the term. In the first creative drama lesson, learners were told to do research on the nature and characteristics of radioactivity radiations and also on the uses, dangers and precautions of radioactive radiations. After they did the research the facilitator asked them to explain the findings of which they did. Learners then came up with an act to perform the concepts. The performers or actors included a certain number of vocabulary words in their skits. At the end of the performance, learners (the audience) were asked to say what they got from the performances. Also, they were asked questions about the performance. Learners who performed and those who watched showed an understanding of the radioactivity concept through the way they were asking and answering the questions.

4.3 The procedure/research tools.

This study used two research tools: Radioactivity Achievement Test (RAT) for pre-test and post-tests and two questionnaires for open-ended questions for students and teachers. The pre-test and post-test provided data for the first research question which is “Do the integration of creative drama activities in physics instruction enhance students’ understanding of radioactivity concepts?” Both groups took these tests. Particulars of Participants’ were not known to the researcher to encourage unbiased grading. A t-test was used to test the homogeneity t-values of the pre-test and the post-test groups and this was analyzed using the SPSS program, version 23. A one-sample t-test was done. The second research question was “How do students in grade twelve and teachers react to creative drama in physics? Student and teacher interview were used.

Student Interviews: Open-Ended Question

The second section with open-ended questions was analyzed using Thematic Content Analysis (TCA). The five questions were given to 10 students from the creative drama group. The data which was collected gave information about whether learners were happy with the creative drama activities, how they felt and how they were helped while participating and in the understanding of science.

Teacher Interviews

The written interview was conducted with two teachers after the second creative drama activity. Questions were asked about their thoughts and opinions about creative drama as a pedagogical tool for learning of science. They were also questioned about the beliefs or rather perception pertaining to the use of creative drama in the learning of physics and any other trends in the student’s attitudes and social behavior. The teacher’s interview consisted of 12 questions. As the teachers were answering the questions, they were not limited to interview length of time. They were given chance were possible to ask questions where they were not clear. The data from this interview was analyzed using Thematic Content Analysis to identify common themes.

5. Data collection/ analysis

Quantitative data included the pre-test and the post-test and it was analyzed using the SPSS program, version 23. Comparisons were made between the two groups, the group with creative drama activities and the other one without creative drama activities. Table 5.1 shows classes and the number of students who participated in the pre-test and post-test.

Table 5.1 Number of Students

Group	label	N
1	with creative drama	50
2	without creative drama	45

In the group of creative drama, the number of students who participated was 50 and in the other group without creative drama, 45 students participated. Table 4.2 shows the number of students who participated in the pre-test and post-test.

Table 5.2 Number of Participants in Pre-Test and Post-Test

Test	Group	Label	N
Pre-test	1	with Creative Drama	50
	2	without Creative Drama	45
Post – test	1	with Creative Drama	50
	2	without Creative Drama	45

5.1 Quantitative Results

Both the pre-test and post-test were to the experimental and control groups and the tests were subjected to a t-test in order to compare if they had knowledge differences in the radioactivity concepts. Table 4.3 shows that there was no much significant difference between the pre-test mean of the two groups. This shows that both groups started the studying of radioactivity with a similar level of knowledge.

Table 5.1 T-Test Comparing t-value and Mean Difference of Pre-test

	T	df	Mean Difference	95% Confidence Interval of the Difference	
				Lower	Upper
Pre-test Expt	14.129	49	18.040	15.47	20.61
Pre-test cont.	18.050	44	21.911	19.46	24.36

Table from SPSS ver. 23

Table 5.1 shows the t-value of the experimental group to be 14.129 and that of the control group 18.050. The difference in the t-value was found to be 3.921

Table 5.2 T-Test Comparing t-value and Mean difference of Post-Test

	T	df	Mean Difference	95% Confidence Interval of the Difference	
				Lower	Upper
Post-test Expt	41.568	49	64.420	61.31	67.53
Post-test Cont.	20.229	44	41.444	37.32	45.57

Table from SPSS ver. 23

When the T-Test was administered to the two groups the creative drama group had the t-value of 41.568 and the group without creative drama had the t-value of 20.229. The difference in the t-value was 21.339 Table 5.3 Summary of t-values and Mean differences for Pre-Tests and Post-Tests

5.2 Qualitative Results

The questions were analyzed using Thematic Content Analysis (TCA) and the findings are in the paragraphs to follow.

Question 10: were you happy to learn science with creative drama activities? Why?

All the ten (10) students’ from the experimental group answered “yes” to the first part of this question. For the second part of the question the “Why” part, students due to a different perception, they had plenty and different reasons why they were happy with creative drama. Using TCA categories for these answers were developed. The numbers in the table show the number of answers and not the number of learners who participated. These answers were apportioned into three categories; “understanding science fast” (8 responses), “enjoyment “(10 responses) and remembering fast “10 responses”. The category “understanding science fast” this come up with answers like “because creative drama makes me understand very much about what was acted and I can’t forget”, “it helps me to understand science concepts in a relaxed manner”, “when

acting I could think of the science concept from a different angle hence making me show that understand science”. The category of “enjoyment” this included responses like “creative drama makes me understand science concepts in an enjoying way”, “it was fun looking at how we acted”, and the lesson was exciting as some science concepts were spoken in vernacular language”. It was nice and more interesting because I could speak what I wanted to speak in the play”. The category of “remembering fast” come up with comments such as “creative drama helps me to remember fast what I learned”, “it helps me to remember fast what the drama activity was all about”, “it enables me to remember fast what I acted and what I did in the play that day”, “when creating a play its simple to memorize the points and concepts”.

Table 5.4 why were you happy with creative drama activities?

Response Category	Frequency of Responses
Understanding science fast	8
Enjoyment	10
Remembering fast	10

The responses and frequencies in table 4.6 show that students enjoyed creative drama activities and they liked learning with creative drama activities which helped them both socially and academically.

Question 11: would you choose to learn science with or without creative drama?

With this question, all the students preferred learning science with creative drama because in their responses they could include responses like “I prefer science with creative drama not without creative drama because if you watch or act you cannot forget, but if you are just been explained to by a teacher it is easy to forget”, “I prefer science with creative drama because it is the easiest way of understanding science concepts”. Others said that “I prefer science with creative drama because personally, I think I learn fast and understand quicker through drama activity on a certain topic”, “I prefer learning science with creative drama activities because it is easy to remember science concepts and the interesting part of the exercising it makes the brain to function properly”. This shows that learners would want to learn science through creative drama activities rather than learning without creative drama activities

Question 12: which creative drama activities did you enjoy much?

All the activities they did through creative drama were listed by students. Most of the students nine (9) of them (90%) chose the activities which took place in the second creative drama activities. They said that this was cardinal and benefiting to their learning. To follow up their answers as to “why they did like while doing those activities”, eight (8) (80%) said that, they got used and that shyness they had in

the first creative drama went. They also said that the vocabulary which was used during the creative drama was of proper science vocabulary which helped them to memorize and understand the words. Most of them pointed out that the least creative drama they did not like was the first one on the “nature and characteristics of radioactive radiations.

Question 13 which Concepts were explained better through creative drama activities?

When answering this question, it was made sure that the learners understood what the question was all about. They were questioned about the activities which helped the students understand the concepts fully and which they did not understand fully before the activities. Seven (7) students pointed out that they were helped by the creative drama activities in understanding the scientific concepts. Only three (3) students which are (30%) replied that they understood even when their teacher teaches them, but they come out and said that using creative drama it made their understanding better. Students said that “I learned better on the uses and precautions of radioactivity radiations”, “I learned better using creative drama on uses and dangers of radioactive radiations”, “I learnt better using creative drama on penetration powers, dangers, uses of radiations”, “I learned better on the gene mutation, safety, and ionizing power because they acted well such that it is easy to memorize’ and write what they said and acted without difficulties”. Table 5.5 shows the list of concepts that were explained better using creative drama activities and the responses students gave.

Table 5.5 Concepts that were explained better through creative drama activities

Response Categories	Number of Responses
Penetration Power	10
Ionizing Power	8
Gene Mutation	8
Dangers of Radioactive Radiations	10
Uses of Radioactive Radiations	10
Precaution of Radioactive Radiations	10

Table 5.5 shows the abstract concepts which learners termed to be difficult to understand. From the number of responses by the students, it showed that creative drama had a great impact which is positive in the understanding of difficult concepts.

Question 14: Would you like to study science after learning with creative drama?

All the ten (10) (100%) students responded “Yes” to this question. the student said yes because of some reasons they gave, “I said yes because creative drama helps me to understand and never forget what I acted and see from other actors”, “I said yes, because the creative drama has helped me to understand the concepts in the easiest way which is

very interesting”. Students had a good experience and enjoyed science with creative drama activities.

Interviews for Teachers

In this study, some themes or patterns that represented both teachers were identified and these were: creative drama require more time, creative drama create and improves student’s social behavior, creative drama helps in the understanding of concepts and the general impression. The two teachers appreciated the value and use of creative drama in the teaching and learning of scientific concepts and in general it improves student’s social behavior and skills. They also observed that creative drama requires more time as drama activities consumed time. As much as they appreciated the use of creative drama, one teacher said that “the most challenging part is it is time-consuming”. Both teachers were happy as the students brought points which they did not expect that learners can have such information. When the learners were performing, teachers could see how they were coming out in the act. They praised the creative drama as it could make quiet and shy students became more pivotal and more open as they performed. Some became friendlier during the practices and they could share information with friends. Teachers commented like “learners were able to interact freely since they got to know each other”, “behavior change was seen through teamwork and communication”, “communication was good as local languages were infused and teamwork was equally good”. Would you want to use some of the creative drama techniques if you could? The teachers responded that; they would adopt some creative drama activities in the learning and teaching of physics. They actually saw that the use of creative drama has a lot of benefits to the learning and teaching process of science. Teachers admitted that creative drama helped the students in the understanding of science concepts. At first, teachers were doubting the student and thought that they could not bring out the points whilst dramatizing. To their surprise, one teacher said that “I was shocked how the students could drive some point to the extent of even use the vernacular language to show that they knew what they were talking about”. The activities really helped especially the weak students as they acted and others saw how their friends come out with good and sound explanations of the concept. Both teachers commented on the importance and benefits of creative drama, the use of vocabulary, and the concept and how they could store them in their mind and integrate them in the act. The general impression of this study was that the teachers commended creative drama as a good tool for learning and teaching of physics. The two teachers commented that “ using creative drama is a good idea as it is a learner-centered method”, “they learned better in creative drama than the traditional way of lecturing and group discussion, as it attracted more attention”, “ creative drama is learner-centered method therefore the students understand better things in which they are involved in”. Both teachers mentioned that creative drama helps learners to learn in an enjoying manner and this makes them pay attention as the actors include some educative jokes, helps them to understand easily.

6. Interpretation of Data

In the quantitative analysis, both groups were subjected to pre-test at the beginning of radioactivity lessons and post-test at the end. A t-test was done on the pre-test and post-test data. In the pre-test, it showed that the T value for the experimental group was 14.129 and that of the control group 18.050 giving the difference of 3.921. This shows that scores were at least close to each other meaning that there was no much significant difference. It also showed that learners had no much knowledge difference. On the post-test, it showed that the experimental group had a T-value of 41.568 and the control group had a T-value of 20.229 giving the difference of 21.339. The group which learned with the integration of creative drama showed a better understanding of radioactivity concepts. This tells that the method or strategy implored in teaching the physics subject was appropriate. In the qualitative analysis, 10 students were interviewed from the group which had creative drama activities. They were given five open-ended questions related to creative drama activities and this was analyzed using Thematic Content Analysis. From the interviews, it indicated that all the 10 students enjoyed the creative drama activities and it helped them to understand complex and difficult concepts in science. Two teachers were also interviewed and their responses were analyzed using Thematic Content Analysis. The two teachers indicated positive reservations to the study of science using creative drama. They were convinced that creative drama helped students in the understanding of science concepts on radioactivity and it had a positive impact on the behavior of students. They also added that the use of creative drama in classrooms requires enough time.

7. Discussion

The results obtained were valid due to the population which was used. Learners were able to interact and this led to a change of student's perception towards physics. This subject is perceived to be difficult, but with the use of creative drama, it helped learner's attitude in physics to change due to the inclusion of creative drama activities. Learners are able to grasp difficult concepts and also be able to understand them in the quickest way as they watch and hear what their friends are performing. The results that were obtained showed that the method implored was good and it yielded the needed results. Creative drama is a tool which can help learners to learn difficult concepts which are sometimes abstract. Now, these results were obtained at a school with mixed gender. It was like this because at this school there are no single-sex classes. It was going to be good if the method was to be tried at single-sex schools, as for this it could be girls or boys who could have dominated in the activities so as to boost the results. The nature of physics is perceived to be very tough or difficult subject at the secondary level. Different methods can actually help in helping students like the sciences. This method can work out for the sciences not only physics alone. Hence if tried it will yield the same results and it will draw the same conclusion. To minimize teacher effect, the creative drama has to be used by teachers as they are teaching physics. At this school

teachers were not conversant teaching using creative drama, as a result, it was difficult for them to teach. When they saw how it was done during the intervention, they were happy and ought to be including creative drama when teaching. A Chinese proverb goes: "tell me and I will forget. Show me and I will remember. Engage me in the job and I will understand." All the studies show that if students are engaged and they have experience through learning, there is a deeper understanding of concepts.

8. Conclusion

It can be concluded that creative drama activities enhance the understanding of (scientific concepts) radioactivity concepts. Despite both groups showed the gaining or understanding of the concepts, the group with creative drama activities showed a better understanding than the other group. This study concludes that Creative drama activities are the solution to the current situation as it enhances students to understand the scientific concepts in a joyous manner as they interact with their colleagues. Creative drama is one of the teaching and learning tools that can trigger interest in learners even those who don't like physics and this method may help improve the performance of our students in sciences.

9. Recommendations

Suggestions for future research:

- i. Since this research was done on a small population and results were not generalized, others generalize the results, by using a larger sample and make some conclusions based on a larger population.
- ii. Teachers of physics and other sciences should be integrating creative drama in their teaching So that learners could be fully engaged in the learning process

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