

Research on the Influence of Linking Natural Science Conceptions to Real Life Situations to Basic School Students in Winneba; A Case of Central Region of Ghana

Author's Details:

Joshua Agyekum¹ Bonah Emmanuel Obeng

¹ College of Education, Huzhou University, China¹

Email: joshuaagyekum21@gmail.com, toolzemmanuel@gmail.com

Abstract

The main purpose of the study is to examine the effect of linking Natural Science concepts to real life situations to basic school students in Winneba, the Central region of Ghana. Precisely using an activity-based method in the learning environment to enhance better understanding, increase performance and to relate concepts in science to real life situations. The study adopted an action research design to improve practice at a single local setting. This is intended to bring about a positive change or improvement of a situation. The implemented strategies used is referred to as intervention. The accessible population comprised all pupils in lower primary of St. John Anglican Primary 'A'. The sample population was all Basic three pupils of St. John Anglican Primary 'A'. The study employed a stratified random sampling technique since the ultimate objective of the research is to improve the performance of pupils offering natural science. Basic school students in Winneba, the Central region of Ghana do not participate actively and consequently performed poorly during Natural Science lessons. The study adopted a diagnostic technique from the perceived problem identified. This depicts the inadequacy of exposing pupils to practical activities and real-life situations, rendering the teaching method teacher centred. The study found out that pupils-centred approach together with relating topics to real life situations can be effective tool in enhancing efficiency in teaching-learning situation. The use of different teaching techniques helped reduce individual differences among pupils. The study findings will be beneficial to basic schoolteachers and school heads to become aware of how they can possibly relate Natural Science topics to real life situations. Further studies can be conducted on the topic by involving a larger sample in order to generalize the findings of the study to a large population which was a limitation for this study.

Keywords: Natural Science, Real life Situations, Action Research, Activity-based teaching

1.0 Introduction

The teaching and learning of science are to adequately equip pupils with the requisite knowledge and skills in order to understand science concepts. By definition, science is the knowledge acquired through observation, inquiry, experiment and evaluation of information gained. The knowledge of science is gained by continuous process of investigation and experimentation of problems and to project the understanding of the natural world. The influence and the impact that science has on the environment as well as life in general, lives a great task on the educational system of the country. It is in view of this that science was enshrined in the school curriculum right from the basic level up to the tertiary level of education to help expose all students to the basic facts and knowledge of science. The application of science ideas to practical situation in the areas of technology have grown significantly, hence the teaching of science at all levels of the educational ladders helps students acquire; scientific concepts and principles to solve problems on their own, skills in the manipulation of scientific apparatus equipment and materials, ability to interpret scientific information and findings in order to make inference, skills in handling and interacting with things in the environment and curious minds investigative attitudes towards the study of science as a whole (Aikenhead, G. 2011). Ultimately, students understand and learn well by performing activities in and out of the classroom, science students learn differently when they are exposed to different methods of teaching and learning such as observing what is being demonstrated, working in groups, interacting with teaching aids and listening attentively to the teacher, thus, the teacher needs to design and look for appropriate practical works for students to exhibits their talents. Teachers often use teaching methods which cater for different learning styles to help students to retain information, or knowledge and also to strengthen their understanding.

The role teaching and learning materials play in promoting pupil's active participation in the teaching and learning process cannot be underscored. In teaching Natural Science, especially, to pupils at the early childhood level, it is important for teachers to use variety of teaching-learning materials appropriately to arouse pupils' interest and attitude towards the learning of this discipline (subject). Apart from promoting learning, which is lasting, encouraging self-learning among pupils, instructional resources facilitate learning by developing a clear and accurate concept in the learning environment. This is a hallmark of exposing pupils to new experiences which seek to enhance creative development and as result, shape the environment which favors learning. This assertion calls for judicious selection and use of instructional resources in the teaching-learning process; in Science to help pupils appreciate and pursue Science in a more appropriate, effective and efficient way to cater for individual and societal myths at any level of the educational ladder. After three months of intensive teaching and observation, the researcher identified a problem from early childhood class to which the researcher was directed. Basic '3' pupils of St. John Anglican Primary 'A' do not participate actively and consequently performed poorly during Natural Science lessons. The researcher adopted a diagnostic technique from the perceived problem identified. The researcher identified the above problem through observation.

1.1. Statement of the Problem

Even though, an attempt has been made by many trying to find solutions to the low performance of pupils in Natural Science and its related disciplines yet, the problem still exists. The low participation of Basic 3 pupils of St John Anglican Primary 'A' during Natural Science is no exception from the existing problems. The fact that traditional beliefs in many communities in Ghana place science under one of the difficult subjects and better still regard the study of Science as a course for witches and wizards has a serious consequence on the educational system and for that matter, the future development of the country. In order to curb the rigors and problems confronting man and for the society to excel technologically, the performance and interest in the subject need to be raised. The researcher employed 'R.A.P.' activity method which conforms to the fCUBE programme to stimulate and sustain pupils' interest in the study of Natural Science. It is against the background that the researcher wants to use teaching-learning materials in improving pupils' performance in Natural Science studies.

1.2. Research Questions

The main purpose of the study is to examine the effect of relating Natural Science concepts to real life situations on basic school students in Winneba, the Central region of Ghana. Specifically, the study was guided by the underlisted research questions.

- i. How will the use of instructional materials in teaching Natural Science improve upon the performance of primary three (3) pupils of St John the Divine Anglican Primary "A" School?
- ii. How will the use of field trips in teaching Natural Science improve upon the class participation level of primary three (3) pupils of St John the Divine Anglican Primary "A" School?
- iii. How will the use of group discussions integrated with games in teaching Natural Science improve upon the academic performance of primary three (3) pupils of St John the Divine Anglican Primary "A" School?

1.3. Significance of the Study

The study will assist teachers, parents and the school to adopt the habit of using appropriate teaching and learning materials to encourage pupils learn and develop interest in Natural Science. The outcome of the study can be used by Circuit Supervisors, head teachers, and most importantly the Ghana Education Services (GES) as a guide for formulating science policies for schools especially at the Early Childhood level. The study could serve as a reference book for fellow researchers who may conduct further research or research of similar topic in future. Practicing teachers and teachers at the Colleges of Education could use the teaching methods and techniques to help improve pupils' performance in Natural Science. In order to help pupils, fit into the society and the world at large since the world is a global village, teachers who handle young children must be trained to receive enough skills and knowledge in teaching pupils. To this effect, the

problems identified by the researcher would not be compounded. This material provides important information for developing human values and personal qualities such diligence, confidence and determination as a preparation for professions and careers in Science, technology and variety of work areas. The research will be beneficial to the researcher since the findings would facilitate and improve competencies in the area of teaching at the field.

2.0 Literature Review

2.1 Nature of Science

Science has two structures, namely, conceptual structure and the methodological structure. The conceptual structure is also known as the product of science and consists of the ideas, facts, theories, hypothesis etc which scientists generate as they work (Ash, D. 2004). The methodological structure of science which is also known as the process of science is the method scientists use to collect data. This method comprises experimentation, classification, observation, reporting, communication, plotting etc. These dispositions according to Eminah (2004) are known collectively as the scientific attitude and include the following attributes: open-mindedness, being critical in thought and observations, respect for other viewpoints, curiosity, objective, freedom from superstition, belief in cause and effect relationship, honesty, use of systematic problem solving procedures, willingness to change one's views in the face of new evidence, suspended judgment, belief that all scientific knowledge is tentative, utilization of different instead of fixed problem-solving techniques, selection and use of recent and accurate material related to problems and seeking facts and avoiding exaggerations. (pp. 383-385) Scientists who possess the above dispositions are expected to attack problems, even in unfamiliar areas, in the same way. According to Barsalou (2003), scientists use extensive experimentation and observation as the basis for the development of conceptual structures. These conceptual structures evolve out of the regularity they find in the phenomena explore during the experiment.

2.2. Effects of Activity Methods on pupils Understanding of Science Lessons

There are many different ways teachers employ in presenting instructions to their pupils. Even though teachers adopt different styles in their presentation, they all strive to achieve the same results. Teaching methods thus refers to the manner in which a teacher effectively and efficiently interacts within the classroom environment to bring about quality learning of a subject matter among pupils. Woods (1995) identified two teaching styles such as: discipline-centred or teacher-centred and pupil-centred which is also referred to the activity method.

Blough and Schwartz (1990) analysed the role of practical work in teaching and learning science. In their study, they pointed out that practical work and demonstration help to improve students understanding and performance in science lessons. Practical work is necessary for acquisition of skills and that students enjoy science lessons through practical work. In practical lessons, students handle apparatus and carry out experiments themselves and when this happens the experience is impressed more firmly in their minds than if they listen to or see from distance. Students are usually found doing things themselves so the use of practical activities in teaching science is psychologically sound as it satisfies their natural edge for activity. The young are curious to know about how events occur in the laboratory and it helps to improve their understanding of science lessons if they observe or perform experiments. Activities carried out during science lessons, broaden student's knowledge and boost their interest. It also helps to consolidate theoretical knowledge. Activity based lessons help students to develop independent ability to work and interpret scientific problems and solution (Talabi, 2007).

Activity-based methods proved to be more superior to content based traditional approaches in terms of students understanding of scientific method and creativity. So practical work or activity-based method, when well organized has an immense influence on students' retention and performance. The activity-oriented teaching of science is an important skill, technique and methods of science such as handling of apparatus, demonstration and investigative type of learning. The development of the useful scientific process skills can only be achieved through activity- based methods. According to Talabi (2007), students tend to remember more what they see, hear and touch. instructional materials create interest which helps reinforce students' interaction with learning experience as the Chinese proverbs says what I see, I remember.

2.3. Using Teaching and Learning Materials (TLMs)

Teaching materials are described as aids materials used in teaching for illustrative purposes. Its ultimate goal is to facilitate and demonstrate an understanding of a lesson (Amoatey, 2000) Teaching and learning materials may be defined to include materials which can be seen or heard and contribute to the teaching and learning process. Learning is done through the use of five senses. Any medium which gives learners the opportunity to use many senses as possible is the best medium in learning (Atiku, 2004). The use of teaching and learning materials arouse the interest of students in what is being taught and make understanding and remembering concepts easily. Teaching and learning materials also serve the teacher the trouble of explaining at length hence the teacher talks less and also encourages students to find more on their own and thereby stimulating self-learning. Teaching and learning materials are divided into three groups; these are audio materials, those that appeal to the sense of learning. Examples are radio, cassette recorders, drum etc. Visual materials are those that appeals to the sense of sight, examples are real objects, chalks, textbooks, charts. The last group is the audio-visual materials which appeal to both the sense of sight and hearing, examples films, video, television etc. (Amoatey, 2000). The use of teaching and learning materials in science lesson delivery brings variety, curiosity and interest among students to assist retention and recall. Students tend to forget what they hear easier than what they see.

Confucius gave a practical statement on how the human mind approaches the learning process: I hear, and I forget, see and remember, I do, and I understand (ITE Teachers Conference Report, 2005). One of the best ways to understand something is to get one's hands on it and actually experiment with it. Therefore, the use of teaching and learning materials must be encouraged in the teaching and learning process during science lessons in the Junior High Schools. Ossei-Anto (1995) again asserted that, science teaching and learning will definitely be better done if the issue of inadequate supply of science equipment and materials is tackled with zeal. He further explained that, learning by doing is one of the cardinal principles of teaching science. Experimentation has put many theories on a sound footing and has also resulted in the rejection of many. History reveals that many beliefs and superstitions were trashed out from the minds of people as a result of experimentation.

2.4. The Use of Field Trip in Teaching Natural Science

Because of the importance that instructional resources such as field trip play in teaching and learning environment; teaching and learning environment; teaching and learning materials, instructional resources, audio-visual materials, teaching –learning resource, teaching aids among others have been used by different authors to describe them. Tamakloe et al (2005) define teaching –learning resource as material used to facilitate the process of teaching and learning. The author distinguished between a teaching resource and a learning resource. A teaching resource is a material which the teacher uses to facilitate the learning, understanding, or acquisition of knowledge, concepts, principles or skills by students. On the other hand, a learning resource is that which the student prepares and or uses to make learning easier than it would have been if he had not prepared and used it. For example, the chalkboard could be a teaching resource or a learning resource. When a teacher is using it in lesson, it is a teaching resource but the moment a student uses it, it becomes a learning resource. Awoyemi (2002) sees teaching resource as anything which might be helpful to teachers to achieve learning objectives and which transmit or help to transmit learning experiences.

Another strategy which is rarely used in science education is the field trip or excursion (Akpan, 1992). It involves organizing a group of pupils to visit companies or industries where things taught in theory can be seen practically. According to Akpan (1992), field trip or excursion can be likened to a visit to another laboratory away from the school's premises, which is equipped with instruments and materials that the school's laboratory does not and cannot contain. Those places they visit can serve as science resource centres, to allow the students to acquaint themselves with principles and phenomena which had been hitherto abstract to them. Field trip enables learners to see those things they have learnt theoretical and makes learning real (Reisman & Payne, 1987). According to Reisman and Payne (1987), it becomes very difficult for learners to forget what had been learnt and seen in field trip. This method is therefore recommended for students at the basic level since they easily remember things they have been taught and seen (Akpan, 1992).

3.0. Research Methods

The study adopted an action research design to investigate the effect of linking natural sciences conceptions to real life situations to basic school students in the Western region of Ghana. Action research was chosen as the study's design because Action research is intended to bring about a positive change or improvement of a situation. For instance, a teacher could adopt a new strategy and methods geared towards a certain expectation in a practical step in bringing about a positive result. Action research therefore involves a focus in practical issues reflecting one's own practices in relation to the researcher and the participants. The implemented strategies used is referred to as intervention. This is intended to bring about a positive change or improvement of a situation. The implemented strategies used is referred to as intervention.

The research took place in Winneba in the Central region of Ghana, precisely at St. John Anglican Primary "A" at the south-western part of Winneba. Having a humble beginning as a mission school, the school was established by the Anglican Missionary. The school can now boast of a population of about 250 pupils made up of about 143 boys and 107 girls. The target group included all pupils in St. John Anglican Primary 'A'. The accessible population comprised all pupils in lower primary of St. John Anglican Primary 'A'. The sample population was all Basic three pupils of St. John Anglican Primary 'A'. The researchers employed stratified random to pick the sample as the population was heterogeneous and for that matter there was the need for different pupils to be represented in the sample since the ultimate objective of the research is to improve the performance of pupils offering natural science. Information for the research was obtained by using the following instruments: observation, class assignments, class tests, informal interview. The major information collected include poor performance of pupils, low interest levels in the subject (Natural Science), Teaching methods of subject teachers and the learning environment. Frequencies and Percentages were used for the analysis of the data collected. The scores obtained by pupils in both pre-test and post-test have been categorized as Very Good (8-10), Good (5-7), Average (3-4) and Below Average (0-2).

3.1. Intervention

The intervention started in the third week of the second term beginning from Monday, 2nd October 2019 to the 23rd of November 2020. Thirty minutes duration was allowed for the intervention, Strategies to begin before and sometimes after classes each day. The researcher employed activity-based method aim at improving the performance of pupils in natural science and more importantly, enhancing its sustainability. The researcher made a conscious effort to use a number of intervention strategies. The following activity-based methods were adopted by the researcher to improve the poor performance. The use of instructional materials such as Field trips, Group discussion (small group), Project work, Games (play-way) and Resource persons.

3.1.1. The Use of Instructional Materials

A number of teaching/learning materials were improvised by the researcher. The combination of the locally available materials and the improvised ones to substitute the real one helped pupil to make a unique contribution and in fact understood the various topics taught during the process of intervention. Taking 'Day and Night' as one of the several topics taught in natural science with the objective of pupils to differentiate and tell what is done during day and night-time, two (2) circular shapes were cut from a manila paper. One was painted black and the other remained (or painted) white. Before the pupils, the researcher put a sun (cut out of paper and painted yellow) on the white shape on the black on the black shape put the moon and stars also cut out of paper and painted white. Starch was used for gluing the improvised sun, the moon and the stars coupled with pictures of sleeping child and animals and also pictures of children and animals awake helped greatly in the lesson. Since pupils were familiar with day and night, discussion on the sun and day, the moon, the stars and night were lively. The variety of teaching/learning materials prepared were used mostly to introduce a lesson, used during a lesson and after a lesson bearing in mind where they were appropriately needed. The primary aim was to help pupils, show increased use of the large and small muscles of their muscles, stimulate self-learning and understanding, depict increased aesthetic awareness and sensitivity and finally, show increased social, emotional, physical and mental behaviour of pupils. Apart from the computer used, the researcher prepares a beam balance for teaching measurement, arm-clock for teaching time, wooden stakes and beanbag for teaching colours, models of the globe, the sun, the moon and the stars for teaching day and night. Locally available materials, relevant pictures, educational toys, audio-

visual aids were employed, all helped to imbue in pupils the spirit of self-learning and clear accurate concepts and skills. A post-test the researcher conducted was to assess pupils' performance.

3.1.2. Field Trips

Tamakloe et al (2005) see fieldwork as any teaching and learning process which takes place outside the normal classroom. Fieldwork can take place within the school, the environs of the school have no Science laboratory and taking the age level of the pupils into consideration, the researcher embarked on a local field trip. Before the trip, a discussion was held in the class as to where pupils will be visiting, the purpose, what to look for and questions to be asked. On two different occasions the pupils were taken outside the classroom to observe the sun rising, the sky and other heavenly bodies when treating "Day and Night" and to observe and identify both living and non-living things in the school environment. Pupils were involved in general class discussion based on their findings during the trip. A post-test 2 was conducted based on pupil's field experiences. Various types of phenomenon were studied through the fieldwork method. Most of the phenomena studied was of scientific importance. There are many who think that such a method is time wasting and lack purpose. On the contrary, the experiences gained by pupils are numerous and are of high educational standard. Pupils were able to organize themselves on their own exhibited creativity and discover many things for themselves.

3.1.3. Group Discussion

Discussion is an activity in which pupils talk together in order to share ideas or information about a topic or problem. The researcher implemented the small group discussion approach so as to invite the active participation of the pupils taking in consideration the mixed ability groups. The various mixed ability group of the class was arrived at from the previous end of term examination results, responses to whole class discussion, class exercise, homework and class tests. Pupils were put into mixed ability group of five (5) to discriminate items by mass weight. Each group were given a piece of paper and a stone. Pupils were asked to put the stone into a basin of water and observe what happened. Each group were asked to report to the class their findings. They were allowed to explain why the stone sunk but not the paper. (Answer: stone; heavy paper; light). Pupils were again asked to compare the weight of beanbags and wooden blocks, the so one and the blocks, the wooden block and the concrete blocks and so on. Members in the group were carefully blind folded using a clean cloth and handkerchief. They were led to lift two items and tell which one is heavier than the other. As a follow-up activity, pupils were led to the interest shopping centre to observe hoe items in the shops were being weighed during sales. The researcher only acted as a facilitator during the activities of the various groups, since pupils tend to learn better from their own colleagues than even the teacher who is considered to be the man of action in the classroom. The buzz-group discussion stimulated pupils' interests as they gain first-hand experience by interacting with the materials provided to create curiosity, critical thinking and problem-solving skills. Pupils were brainstormed to come out with their findings during the whole-class discussion. Individual's contributions prompted the researcher to conduct a post-test, the result of which was rewarded in Table 3.

3.1.4. Project Work

This was a technique used to extend concepts that pupils have learned through series of related problems with expected outcome in their own understanding, interests and perceptions. In one vein, pupils were asked to draw all the non-living things identified on the school environment individually when embarked on a field trip in the school vicinity. In another vein, pupils were asked to model two (2) examples of energy giving food in groups of five (5) using clay. In each case, the purpose was to facilitate learning, enhance co-operative learning and finally encourages the transfer of learning. A post-test was conducted to find out their level of performance and the result recorded in Table 4.

3.1.5 Games

Children by nature, learn mainly through play. With this idea, the researcher employed a series of games to facilitate pupils' learning. Even though a game is a learning activity with rules, competition, winners and losers, the researcher adopted games to reduce competition and encourage co-operation by

having rotating teams. Unhealthy competition has the potential to minimize participation and learning since losers might lose interest and learning goals would have been lost if competition becomes too important. In teaching “Healthy Living” in personal hygiene for example “Burnt” game was employed to help increase social, emotional, physical and mental development of pupils. On the playground, one child had a ball and the other jumped and ran into the area designed for the game. That with the ball attempted to throw it so that it touches another child. The child who was touched with the ball is declared “burnt” and had to sit down. The one who remained “unburnt” is declared the winner. The children were told to hit below the waistline. A game involving a “number line” was designed to teach addition and subtraction since the researcher had the opportunity of handling both Natural Science and Mathematics. A “bean-bag” was designed to teach “Natural colours” and walking patterns. For instance, beanbags were placed in a pattern on the floor 30-40cm apart and pupils were assisted to walk on the beanbags without slipping on the floor. “KIM’s GAME” was also designed to help pupils memorize a member of living things learned. Other games like “cat and the rat” “Fruit salad”, “Wild animals”, “Logic Blocks” and “Pantomime” were all designed to stimulate pupils’ interest in learning Natural Science. Apart from the variety of games designed for pupils, a rehearsed dramatization based on the topic “Personal Hygiene” taught were also employed to entertain pupils. The various games and plays organized for the pupils made the teaching and learning more simple, natural and effective as pupils were later found to imitate other characters in the play even after school. A Post-Test was done to study pupil performance level. The results were recorded in Table 5.

3.1.6 Resource person

Periodically, a resource person was invited to talk to pupils on some aspect of some peculiar topics in the teaching syllabus for Basic Three (3). This was made possible after seeking permission from the headmistress. After a brief introduction, the expert was given time to talk vividly to pupils. Pupils were given the opportunity to ask questions for an appropriate response from the resource person. Post-Test was conducted to ascertain their interest level and understanding. Few questions were set for pupils.

3.2. Pre-Intervention

Before the implantation of the intervention, the researcher administered a pre-test to know the actual academic performance of the pupils on the problem identified. Base on pupils’ level, five multiple choice questions were set for them. The pupils were given 30 minutes within which to submit their scripts for marking. The researcher collected the pre-test data as a baseline of the results recorded in table 1 in chapter four. Pupils were also observed for enthusiasm and how well they were interested during natural science lessons. For example, pupils were observed to be seeking permission to go out to urinate. The frequency at which most of the pupils went out of the class, paved way for the researcher to find out what the pupils were really doing outside the science class. It was later discovered that, the pupils went outside the classroom only to play and for that matter do their own thing. Some few pupils were also found sleeping. In another vein, the researcher observed the lesson of another natural science teacher in another stream, this was not for the first time and noted that about half the size of the class were drawing objects learned during the creative art period. The researcher adopted an informal interview on the pupils. A pupil would be called and random, after a natural science lesson and would be engaged in a conversation related to lesson taught. The purpose was to determine the interest level, understanding and more importantly, their satisfaction with the lesson. Focused group interview was also used to get pupils mind about science lessons. Apart from the pre-test, class exercises, interview, observation employed by the researcher, a simple questionnaire carefully designed to solicit for pupils’ interest, understanding and how well they satisfied in natural science lessons. The questionnaire was issued to pupils, read out to them before assisting them to choose answers to the questionnaire.

3.3 Post Intervention

After implementing the intervention strategies above a Post-Test was again conducted to find out whether the intervention has yielded a positive result. The marks obtained out of ten (10) were recorded in Table 5.

4.0 Results and Discussions

This section of the study deals with the presentation and analysis of the qualitative data obtained during the study including reflection of the distribution of marks (scores) obtained by pupils during the pre-test and post-test stages. The purpose of the study is to use the results gathered in the field to determine the outcome of the study by indicating the effectiveness or otherwise of the intervention used. The data has been presented in a tabular form, followed by a brief discussion.

Table 1: Pre-Test on Pupils' Performance on the Topic 'Day and Night'

Performance level	Number of pupils	Percentage performance
Very good	1	3%
Good	4	14%
Average	10	33%
Below Average	15	50%
Total	30	100%

Information in Table 1 reveals that. only one (1) person out of thirty (30) pupils representing (3%) was able to solve questions on day and night, four (4) pupils also hard good representing (14%), 10 pupils representing (33%) also performed average and then 15 pupils representing (50%) performed below average. After the pre-test on the topic, the researcher saw that the general performance of pupils in science lessons, therefore the researcher puts in an intervention measure to help class two pupils of St John the Divine Anglican Primary "A" School. Below is the result after the intervention.

Table 2: Post-Test on Pupils' Performance After the Use of Instructional Materials

Performance level	Number of pupils	Percentage performance
Very good	14	46%
Good	9	30%
Average	4	14%
Below Average	3	10%
Total	30	100%

From table 2, it is observed that, 14 pupils representing (46%) were able to answer questions on day and night correctly, 9 pupils representing (30 %) scored good, then 4 pupils representing (14%) scored average and the 3 pupils representing 10% scored below average. From the result of pre-test to that of post – test it shows clearly that there was a massive improvement in pupils' performance when the researcher intervenes by using instructional materials.

Table 3: Post-Test on Pupils' Performance after the Use of Field Trips

Performance level	Number of pupils	Percentage performance
Very good	12	40%
Good	18	60%
Average	0	0%
Below Average	0	0%
Total	30	100%

Table 3 shows results of all 30 pupils who embarked on the field trip when treating "sun rising, the sky and other heavenly bodies". The researcher observed that pupils were able to answer questions without much difficulty because there massively participated in the lesson. 12 pupils representing 40% performed Very Good, 18 pupils representing 60% were good performers, no one's performance was average and below average.

Table 4: Post-test on pupils' performance after the use of the "Burnt" game

Performance level	Number of pupils	Percentage performance
Very good	15	50%
Good	13	43%
Average	2	7%
Below Average	0	0%
Total	30	100%

Table 4 indicates that out of 30 pupils in the class, 15 representing 50% performed very good, 13 pupils representing 43% were good performers with only 2 pupils representing 7% on average performance

and none performed below average. This shows clearly that activity-based method of teaching promotes higher achievement of learning objectives.

Table 5: Post-Test on Pupils' Performance After the Use of the Group Discussion Method

Performance level	Number of pupils	Percentage performance
Very good	21	70%
Good	9	30%
Average	0	0%
Below Average	0	0%
Total	30	100%

Table 5 shows results of all 30 pupils who participated in the group discussion on the "weight of objects". The researcher observed that pupils were able to discuss and tell the reasons why a stone will sink in water and a paper will float. 21 pupils representing 70% performed very good, 9 pupils representing 30% were good performers and with average and below average none scored that. This shows clearly that pupils had improved in participating in classroom activities and now perform incredibly well in science exercises and tests.

4.1. Discussion of Results

Considering the pre-test scores from table one, majority of pupils, thus 25 of the total number of 30 pupils involved in the study (83%) performed abysmally. This was a clear indication that pupils needed intervention. From the last post-test results (i.e., table 5), the researcher observed that pupils were able to discuss and tell the reasons why a stone will sink in water and a paper will float. 21 pupils representing 70% performed very good, 9 pupils representing 30% were good performers and with average and below average none scored that. This shows clearly that pupils had improved in participating in classroom activities and now perform incredibly well in science exercises and tests. Pupils-centred approach together with intermittent use of small group discussion can be effective tool in enhancing efficiency in teaching-learning situation. The use of different teaching techniques helped reduce individual differences among pupils. Using field trips foster concrete basis for conceptual thinking thereby widening pupils' range of experiences in real life situations. The attitude of pupils towards a particular is directly proportional to the general attitude of the society in which find themselves. Employing games in the teaching-learning situation among young children is a co-operative tool for creating a happy and comfortable place for learning.

Research Question 1: The study found that comparing the results of the pre-test to the post test, it can be seen that there was a significant improvement in pupils' performance after they were taken through the intervention processes. This shows that when pupils are made to actively manipulate and handle instructional materials in the teaching of science concepts, it eventually enables them to grasp the idea and content of what is been taught.

Research Question 2: It was found in Table 3 indicates that there was a remarkable improvement in pupils' performance after the use of the field trip. Comparing this to the pre-test, the researcher observed that pupils were able to answer questions without much difficulty because there massively participated in the lesson. 12 pupils representing 40% performed Very Good, 18 pupils representing 60% were good performers, no one's performance was average and below average. This denotes that the intervention proved successful but there was room for more improvement.

Research Question 3: It was further found that the post-test results of table 4 and 5, the researcher observed that pupils were able to discuss and tell the reasons why a stone will sink in water and a paper will float when group discussion integrated with games was used. 21 pupils representing 70% performed very good, 9 pupils representing 30% were good performers and with average and below average none scored that. This shows clearly that pupils had improved in participating in classroom activities and now perform incredibly well in science exercises and tests.

5.0 Conclusion and Recommendations

The study concluded that the problem of poor performance and low participation in Natural Science at the lower level in our schools is becoming more or less like a religion in society. The remarks made by most teachers that lecture method of teaching which encourages rote learning among young pupils

is less demanding and considered easier to use is suitable, after all they were taught by such method. This remark sounds like recklessness close to righteousness. This is because children by nature, learn mainly through doing. In sum, this study has promoted the personal and professional development as far as teaching and learning of Natural Science is concerned. The analysis of the results obtained from the Pre-Tests and Post-Tests, based on the research questions, shows a better performance among pupils when exposed to a variety of teaching activities. Pupils' performance depends greatly on their own activities in a learning situation hence the teaching of Natural Science should be activity-oriented so as to challenge pupils to develop their own ideas and to make the subject more meaningful and relevant. In this way, pupils will see Science as a home rather than spiritual symbols.

The study further recommended the use of instructional materials, field trips, co-operative learning and games should be employed by teachers handling Natural Science especially at the Early Childhood level. In a situation where the actual material is difficult to come by teachers could improvise. Pupils' questions are as important as teachers' questions and as much as possible, teachers must pay a particular attention to pupils' questions. Methods and styles of teaching should as much as possible be varied to suit pupils' interest, age, levels and capabilities. This approach would cater for individual needs. Resource centres should be established at the district and circuit levels to enable teachers to come into contact with resource persons to learn the modern methods and rudiments of handling the various topics in the Science syllabus. Inadequate number of textbooks and even the few existing ones are outmoded at the preschool and primary levels of education. Authors in this subject area must be encouraged to write more books to supplement the current syllabus released by the Curriculum Research and Development Division (CRDD) to ensure analytical thinking and practical scientific problem-solving skills among pupils. Regular supervision exercise must be enforced to enhance efficiency of teaching delivery. The Ministry of Education and G.E.S should constantly organize rigorous in-service training, seminars and workshops regularly for all teachers at the early childhood level and beyond to equip them with the pre-requisite skills, knowledge and practical methods of the modern trend of teaching and learning concepts in Natural Science.

Conflict of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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