Teaching Interactive Art Lessons with Recycled Waste Materials as Instructional Resources

Rita Yeboah[1*]   Eric Appau Asante[2]   Nana Afia Opoku-Asare [3]
Faculty of Art, Department of General Art Studies, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

Abstract
The study examines the use of waste materials as instructional resources in teaching and learning Art lessons. Primary, Junior and Senior High School Art teachers in Ghana mostly teach their lessons without instructional resources because the government is not able to provide materials to create the needed resources. The study therefore explored local waste materials which create nuisance in the environment in Ghana to create appropriate teaching resources for Art in Ghana. This study shows differences in classroom atmosphere and student performance when instructional resources are used or not used in teaching and learning. The study adopted the exploratory, quasi-experimental and descriptive research methods. Art teachers from Kumasi were selected to teach with developed instructional resources after which lessons taught with and without the instructional resources were compared. The study found that when instructional resources are used for teaching and learning, lessons become more practical, interactive, interesting and real to pupils and students, and enables them to perform better in their academics.
Keywords: Instructional Resources; Waste Materials; Recycling; Teaching and Learning;

Importance of Using Instructional Resources in Teaching and Learning
Clarification and Illustration of Concepts
The one major reason for poor performance among learners is the abstract manner of which the courses are taught them. Aina (2013) and Adeyemo (2010) are of the view that the absence of instructional resources such as pictures, models or real objects makes it difficult for learners to understand communicated information. This is because young learners usually lack the ability to assimilate concepts abstractly making it imperative to adopt the use of interactive instructional resources. Instructional resources are very useful because they enable the teacher to clarify concepts to make learning more practical (Wathore, 2012). In many instances, the teacher may be faced with the problem of explaining some difficult ideas with which students are not familiar with, if this happens and the teacher does not have instructional resources to use, he or she may resort to various unhelpful means to explain the concept (Wathore, 2012). Educational activities carried out by using instructional resources displays several subjects, cases, works and operations in line with their real-life versions where students observe them by themselves to enrich the teaching process and increase the amount of learning (Yildirim, 2008). For example, a resource on one point perspective will help clarify the concept of perspective in terms of the appearance of close and distant objects to an observer, a resource on vanishing point and the horizon which will help learners understand the concept easily. A good visual aid is better and more effective in explaining a concept or point than several words of verbal communication. The idea is that visual aids help to illustrate and bring a sense of reality to what is taught therefore they produce simulating interest by creating correct impressions and bringing lessons to life (Yildirim, 2008). Instructional resources provide a great deal of convenience in teachers' ability to convey a message to students in an accurate, proper, clear and understandable manner, making abstract knowledge concrete and enabling students to comprehend complex ideas through simplification (Saglam, 2011).

Arousal of Interest
Instructional resource usage in teaching enables the teacher to arouse interest among students to enjoy an instruction (Onasanya, 2004). Students may not be interested because the learning experience is too abstract and vague, so they find it difficult to understand, grasp or create a mental picture of it. Once the teacher uses instructional resources such as models and specimens students' interests are aroused. Such an interest propels students to learn and enjoy the lesson (Wathore, 2012). Instructional resources are used in teaching and learning to focus attention of students, to reduce boredom in the classroom, and to make the teaching learning process more systematic, exciting and lively (Wathore, 2012). Igbo and Omeje (2014) adds that the use of instructional resources attract the attention of pupils and enable them to participate in the topic being taught by using the resources as reference to illustrate their thoughts and ideas. Utilisation of instructional resources really has the ability to provide a high degree of interest for students to involve themselves in an instruction (Ruis, Muhyidin & Waluyo, 2009).

Assimilation of Ideas and Knowledge
Since students get to observe instructional resources than mere words, they are effective in helping learners assimilate ideas and knowledge in the teaching and learning context. Teaching resources reinforce the processes

of learning by stimulating, motivating and arresting the attention of learners (Okobia, 2011). Well-designed instructional resources enrich the teaching process, facilitates learning and yield to a multi-learning setting (Yildirim, 2008), the reason being that the number of sense organs stimulated through teaching with instructional resources increases, paving the way for efficiency and persistency in students' learning. In totality, when students are given the chance to learn through more senses than one, they can learn faster and easier (Okobia, 2011; Saglam, 2011). Until concepts are presented in the form of visual aids, students may not readily grasp the meaning of concepts and ideas (Olawale, 2013).

Extension of Imagination and Experiences

Instructional resources help the teacher to extend students' imagination and experience far beyond the classroom. One of the biggest advantages of instructional resources is to bring the world into the classroom when it is not possible to take the student into the world (Florida State University Handbook, 2011). Places like markets, railway stations and airports cannot be brought to the classroom for teaching and learning but through the use of instructional resources a teacher can use pictures and models to depict everything that cannot be brought to the classroom to teach a lesson. That is a teacher is assisted in overcoming physical difficulties that could have hindered effective presentation on a given topic with the use of instructional resources (Wathore, 2012; Okobia, 2011; Ruis, Muhyidin & Waluyo, 2009).

Retention of Knowledge

Using instructional resources in teaching and learning assist learning by helping students visualise lessons and transfer abstract concepts into concrete, easier to remember objects which allow students to learn more and retain better what they have been taught. Appropriate instructional resources in teaching and learning enrich learners' knowledge of an instruction and reinforce verbal instruction for easy retention of knowledge (Igbo & Omeje, 2014; Florida State University Handbook, 2011).

Improvement of Quality of Instruction

An instructional resource helps a teacher in presenting a lesson effectively before students. This is because before the teacher goes to class, he or she would have to carefully organise and know how to use the instructional resource to present the lesson to students, this preparation can allow for the teacher to confidently and effectively use the resource to present a well-organised, consistent, specific, and clearly defined lesson for students to understand (Owusu-Koranteng, 2009). Making use of teaching resources can also make delivery of instruction to be much more standardized as learners' with varying abilities can receive the same message from an instruction and their individual differences catered for. The quality of teaching and learning can be improved through careful integration of instructional resources and words (Onasanya, 2004).

Promotes and Widens Communication

Using instructional resources in teaching widens the channel of communication between teachers and their learners. Classroom interaction can be interactive when instructional resources are used. Thus using instructional resources can promote and stimulate student-student interaction, student-teacher interaction, and teacher-student interaction. The use of instructional resources results in more cooperative learning activities between teachers and students. On the whole, teaching resources ensure the application of classroom-oriented communication techniques and allow the growth of specific learning abilities, and enhance intellectual skills and motor skills of students (Florida State University Handbook, 2011; Onasanya, 2004).

Saves Teaching Time

The systematic utilisation of instructional resources in the classroom significantly saves teaching time as their use requires short time to explain concepts and present large information. This benefit can make manifest in the time spent on tasks by both the teacher and the students (Olawale, 2013; Wathore, 2012; Abdelraheem & Al-Rabane, 2005; Onasanya, 2004).

Why Recycle Waste Materials?

Waste is perceived to be a problem for many reasons: waste disposal can harm the environment and human health; space for landfills is becoming scarcer; costs are increasing to use existing and replace landfills (Caulfield, 2009). Disposing of waste into landfills or burning has huge environmental impacts and can cause serious environmental problems. Some waste on landfill sites will eventually rot, but not all, and in the process of the decomposition, they produce noxious smells from the methane gas (a greenhouse gas 20 times more potent and harmful than carbon dioxide) it generates which is explosive and contributes to the greenhouse effect (Vergara & Tchobanoglous, 2012; Cho, 2012; Green Choices, 2002). According to Green Choices (2002), leachate produced as waste decomposes causes water pollution and open dumping sites also attract vermin and cause litter in an environment, which can cause the break out of diseases and also create nuisance in the environment. Incinerating waste tends to produce toxic substances such as dioxins (a group of chemicals that are formed during combustion processes such as waste incineration), which cause air pollution and contribute to acid rain, while the ash from incinerators contain heavy metals and other toxins that are all harmful to the inhabitants in the environment (Vergara & Tchobanoglous, 2012). Dioxins are extremely toxic even in very low doses. It

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can build up in our bodies and it can cause cancer and may affect hormones and unborn children (Jucyte, Kevelaitis, Renzhong, Hirschpold, Varona & Debin, 2005). The Energy Information Administration as cited by Boehlke (2010) explains that these gases destroy the earth's ozone layer and contribute to significant climate changes or global warming.

Disposing of waste in the environment also choke gutters and drainage ways thereby causing flooding when it rains. Plastic bags are capable of holding rain water for several days, thereby providing breeding habitats for mosquitoes. The prevalence of improperly disposed plastic bags has been linked to the spread of malaria in some developing countries (Mangizvo, 2012). Humans are not the only ones affected by improper garbage disposal, animals too are. Boehlke (2010) indicates that a heap of waste materials on a dumping site can be carried by rain into water-bodies to suffocate and contaminate marine animals leading to the death of millions each year. This contamination destroys the habitat of these animals and can also affect humans as fish that feast from these contaminated areas are caught by fishermen for human consumption.

Waste disposal or burning is not just a serious problem, it is also a growing problem. Because of the significant and growing environmental, social and economic challenges presented by waste, there are active campaigns against waste incineration with a focus on waste recycling. But according to Schiessler, Thorpe, Jones and Philips (2007), the problems that waste poses to societies can be controlled if societies become environmentally efficient recycling societies and are ready to act right to prevent the indiscriminate disposal of waste. This will ensure the protection of human health and the environment against the harmful effects of waste. In this regard, the researchers believes that in Ghana, rather than throwing away waste or burning them to pollute the environment, they can be recycled to create useful instructional resources for teaching and learning, to give meaning to the global call to "reduce, reuse and recycle as the only acceptable ways of disposing trash" (Katkar & Bairgadar, 2010). But this can only be done through explorations with waste materials and through education.

The Effects of Waste Disposal in Ghana

"I recently visited Ghana and one cannot miss the plastic waste that is swallowing the motherland" (Essien, 2014). Waste disposal in the environment has become one of the major problems facing the Ghanaian society today. In as much as the people and the government want to make the environment safe from any dirt-transmitted diseases, both groups do not put in much effort in making the environment a healthy place to live in. Waste disposal in the Ghanaian environment, has made it very impossible for the country to have a stinking and disease-free environment (Selby, 2010). The Ministry of Local Government and Rural Development reported in 2010 that respiratory tract infections which are examples of poor-sanitation related diseases constituted about 85 percent of the reported cases at outpatient facilities in the country with seasonal epidemic outbreaks of cholera (Addaney & Oppong, 2015). Aside from the many diseases that waste disposal in the environment brings, in Ghana disposed waste materials in the environment choke gutters and drainage ways and cause flooding when it rains. A recent example is the Wednesday 3rd June 2015 flooding in Accra that was caused mainly by choked drainage systems by all manner of waste materials. Drains clogged by plastic bags and other waste items overflowed, causing a massive flood in which at least 150 people were reported dead out of which 90 were burned alive when the runoff water carried fuel into a fire (Hinshaw, 2015). Apart from the loss of life the flooding also destroyed a lot of properties (Hinshaw, 2015). Every year when the flooding occur during the raining season, a lot of discussions and lamentation are made on the air waves by experts and the citizenry on the issue tentatively and nothing is heard of it again when the dust settles. Government sets up committees to look into the situation, some buildings which are perceived to be on water ways are demolished and nothing is heard of the situation again until it reoccurs the following year (Acheampong, 2010). Unfortunately, choked drains as a result of disposing waste materials in them which are the main cause of flooding in the country have not been given the needed attention by both inhabitants and the authorities responsible. Flooding of the cities during the raining season has therefore become a cyclic cataclysm (Acheampong, 2010). Rather than throwing waste materials in the environment to cause all these problems, the waste materials can be collected and recycled into other useful items for the benefit of the country.

Theoretical foundation of the Research

The study is grounded on three theories of teaching and learning as follows, Dale's Cone of Experience, Active learning and Multiple Intelligences:

Dale's Cone of Experience

Molenda (2003) describes the Cone of Experience as a visual device which summarizes Dale's classification system for the varied types of mediated learning experiences. The organising principle of the Cone is the progression from the most concrete experiences (at the bottom of the cone) to the most abstract (at the top). Dale's Cone of Experience suggests that after two weeks of learning encounters, people generally remember 10% of what they read, 20% of what they hear, 30% of what they see, 50% of what they hear and see, 70% of

what they say and write, and 90% of what they do as they perform a task. The implication is that people learn best when they use perceptual learning styles, which are sensory based. In other words, the more learners are made to use their senses such as sight, hearing, touch, smell and movement in learning activities, the easier for them to retain more of what they learn but when less of the senses are used, learners retain little of what was learnt (Anderson, n.d). This means that if Art teachers incorporate active strategies in their lessons by the use of appropriate instructional resources to make lessons practical to students, there is evidence from Dale's Cone of Experience that such an environment will make students assimilate and retain more of what they are taught than just hearing a lecture. Ramadhan (2012) adds that when teachers design their teaching in such a way that they are more concrete and also involve activities that make the students learn by engaging in practical activities, maximum retention of what is learnt is achieved.

Active Learning

Active learning is an instruction method wherein students are actively engaged in building understanding of facts, ideas, and skills via learner-centred activities directed by the teacher rather than passively listening to a lecture and taking notes (Eison, 2010; Bell & Kahrhoff, 2006; Prince, 2004). This means that active learning occurs on a platform by setting up situations and experiences that allow students to be in constant engagement with the learning material individually or with their peers, while socially constructing greater understanding of the topic. Astin (1993) and Bonwell and Eison (1991) as cited in Prince (2004) express that students involvement in an instruction is one of the most important predictors of a successful instruction which helps to bring about better attitudes and improvements in students' thinking and writing. Here since concepts (ideas, issues or concerns), contexts (information and perspectives that inform the meaning) and techniques (approaches and methods) are all essential areas of content in Art education, the use of appropriate instructional resources in an active learning atmosphere will help Art teachers to be able to demonstrate and explain easily the concepts, contexts and the techniques involved in Art lessons for students understanding.

Multiple Intelligences

Gardner's (1999) multiple Intelligences unveil academic strengths of individuals and honours alternative ways of learning. What the Multiple Intelligences theory shows is that every learner has the capacity to exhibit all of these intelligences, but some intelligence are more highly developed than others in certain individuals. The key issue with regards to Multiple Intelligences and education is that it allows teachers to think differently about how students learn. Teachers who integrate Multiple Intelligences theory into their teaching consciously expand their curricular offerings to address students' different intelligences and to provide all students with learning experiences that can lead to better learning opportunities (Kornhaber & Krechevsky 1995 as cited in Fierros, 2004). The information on this theory was reviewed because there are different learning styles in every classroom so teaching and learning must be varied to include everybody.

Methodology

This qualitative research work employed the exploratory, quasi-experimental and descriptive research methods to conduct the study. The exploratory research method was used to explore paper, plastic and fabric waste materials to create useful and appropriate instructional resources for teaching Art. The quasi-experimental research method was used to compare teaching and learning situations with and without the use of the developed instructional resources. The descriptive method was used for describing and analysing the feedback obtained from the two teaching and learning situations at different levels of education in Ghana. The population for the study was made up of Art teachers in the Kumasi Metropolis out of which convenience and purposive sampling methods were used to select 14 practising Art teachers from nearby schools: Emena Primary School; KNUST, Bomso, Emena and Kentinkrono Junior High Schools; and the KNUST Senior High School. The Art teachers used the developed instructional resources to teach lessons on Colour, Perspective, Figure drawing, The Elements and Principles of Design and Weaving at Primary, Junior and Senior High Schools in Kumasi and lessons taught with the instructional resources were compared with the lessons that were taught without using any instruction resources. Participant observation and interview were used to collect data for the study.

Presentation of Findings

Instructional resources were designed and developed by the researchers for teaching colour, perspective, figure drawing, elements and principles of design and weaving.

Instructional Resources Developed for Teaching 'Colour' from Waste Materials
   1.   **Sample Resources for Teaching 'Colour' in Primary School**

Plate 1: Resource for teaching
'primary colours'

Plate 2: Resource for teaching 'secondary
colours'

Plate 3: Resource for teaching
'tertiary colours'

Plate 4: Resource for teaching 'intermediate
colours'

   2.   **Resources for Teaching 'Colour' in Junior and Senior High School**

Plate 5: Resource for teaching
'primary colours'

Plate 6: Resource for teaching the 'six point
colour wheel'

Plate 7: Resource for teaching
'tertiary colours'

Plate 8: Resource for teaching the 'twelve
point colour wheel'

Teaching Colour Lessons with the Developed Instructional Resources

At Emena Primary School, the teacher reported that the instructional resources on 'Colour' made it easy for her to teach a lesson on 'colour mixing'. She explained that because the resource enabled her to show the real colours she was talking about to the pupils and also allowed the pupils to see the real colours being mentioned, the resources helped the pupils to easily grasp what she taught them. "Using the instructional resources ensured higher concentration and participation by the pupils during the lesson". According to this teacher, the resources made the pupils to understand what they were taught under 'colour mixing' because all the pupils were able to use the resources to identify the primary colours. They could also mention the primary colours that could be mixed to obtain the secondary colours and were able to mix the primary colours they were given to obtain secondary colours. According to her, "Using the resources in teaching made the pupils understand the lesson much better done previously that I taught without any resources. Previously after teaching the lesson only about half of the pupils in the class could explain the process of mixing primary colours to result in secondary colours but with the resources as examples, all the pupils were able to do so excellently (personal communication, June 17, 2014).

According to the KNUST JHS teacher, the use of the resources on 'Colour' helped the pupils to identify colours and how other colours are derived by mixing some colours. His comments were "The resources on tertiary colours helped the pupils to know how the various colours were derived from the secondary colours, which previously I would only use words to explain verbally or by writing details on the white board. The 12-point colour wheel enabled the pupils to know the intermediate colours that fall between the primary and secondary colours. The resources made the lessons easier and interesting with the pupils experiencing the reality of colours that were explained to them. This made them understand what was taught more than when teaching was done without any resources. The pupils were able to answer the verbal questions that were asked during the lessons very well to show their understanding, which also reflected in the practical artworks they produced as against works from previous lessons that were taught without any instructional resources" (personal communication, February 18, 2014). Plates 9 and 10 respectively show sample artworks produced by pupils after being taught 'colour' with and without instructional resources.

Plate 9: Sample practical works on 12-point colour wheel by pupils who were taught with the instructional resources
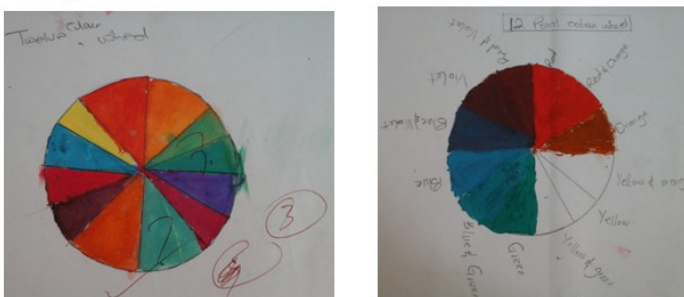

Plate 10: Sample practical works on the 12-point colour wheel by pupils who were taught without instructional resources

In KNUST SHS, the teacher reported that the sample resources made it very easy to teach the lesson on 'colour theory'. The resources made the lesson tangible and very practical because the students had opportunity to see and have a feel of what was taught and provided the needed explanations to be done easily. This teacher indicated that "Without the resources in teaching this topic, the teaching becomes abstract and since Art is a practical subject, it has to go with realistic resources like what was provided for the lesson. Without such practical resources it is very difficult explaining concepts in a lesson for students to comprehend. Teaching without instructional resources takes 3 periods to teach the lesson, but with the resources 2 periods was used in teaching the lesson". The teacher reported that from a test that the students took at the end of the lesson which was marked out of 20 marks, all the students scored between 16 and 19 marks out of 20 with only one person

scoring 12. According to this teacher, in previous lessons taught without instructional resources, a test on the lesson saw students scoring between 10 and 15 marks, which meant the use of the sample resources improved the students' performance (personal communication, May 13, and June 09, 2014).

Instructional Resources Developed for Teaching 'Perspective' from Waste Materials
   1.   **Resources for Teaching 'Perspective' in Primary School**

Plate 11: Resources for teaching 'one point and colour perspective'

   2.   **Resources for Teaching 'Perspective' in Junior and Senior High School**

Plate 12: Resource for teaching 'one point and colour perspective'

Plate 13: Resource for teaching 'two point perspective'

Plate 14: Resource for teaching 'three point perspective'

Teaching Perspective Lessons with the Developed Instructional Resources

At Emena Primary School, the teacher reported that "The resources made me confident and bold to present a more concrete lesson. The instructional resources made it easy to explain the concepts to the pupils, which made the lesson more real. There was no need taking the pupils out of the classroom to use things like the road for further explanation on perspective. The use of the resources made the pupils to pay attention and concentrate on the lesson, which was more interactive and very interesting as the pupils were aided to interact with the instructional resources and also to ask and answer questions. A test on the lesson which was marked over 15 showed that out of 38 pupils, 15 pupils scored 100% (15/15), 20 pupils got 12 out of 15 and 3 pupils scored 9 out of 15. Without the use of instructional resources I could not explain the concepts very well and the pupils were not able to comprehend what I taught them. This situation did not make the pupils able to answer questions that they were asked during the lessons" (personal communication, May 30, 2014). Plate 15 – 16 show sample practical works produced by pupils who were taught with and without the instructional resources respectively.
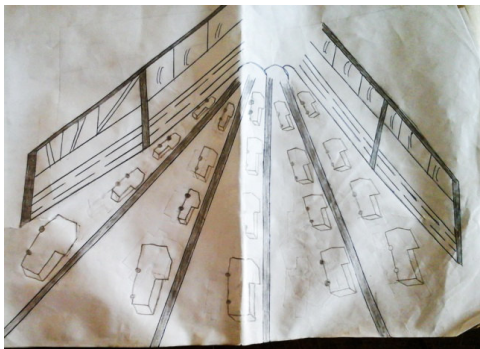
Plate 15: Sample practical works on one-point perspective by pupils who were taught with the instructional resources
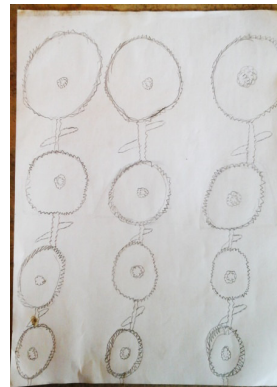

Plate 16: Sample practical works on one-point perspective by pupils who were taught without instructional resources

In KNUST JHS, the teacher reported that "The instructional resources aided in the pupils' understanding of the concepts of perspective because the resources explained and addressed the reality of the concepts in perspective. Previously I taught the same lesson to the pupils using drawings made on the whiteboard but this week when I used the resources and the board drawings in teaching, the result was far better. The pupils used the instructional resources to answer verbal questions excellently during the lessons plus the pupils were able to do their practical works correctly than in the previous lessons that were taught without using any teaching resources; the resources helped a lot" (personal communication, February 03, 2014). Plates 17 and 18 show practical works produced by pupils after being taught with the sample resources and without any resources respectively.
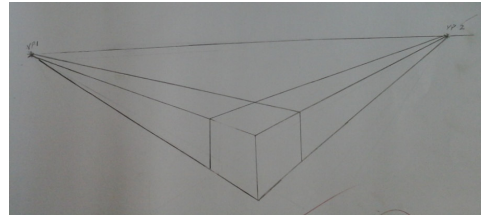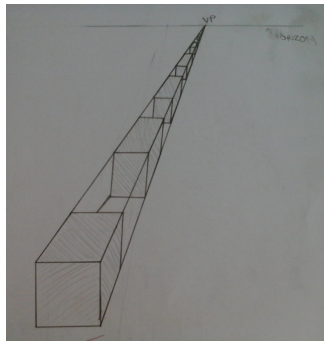
Plate 17: Sample practical works on one- and two-point perspective by pupils who were taught with the instructional resources
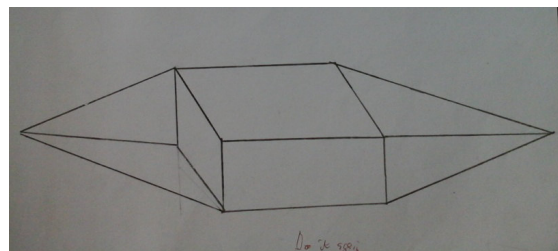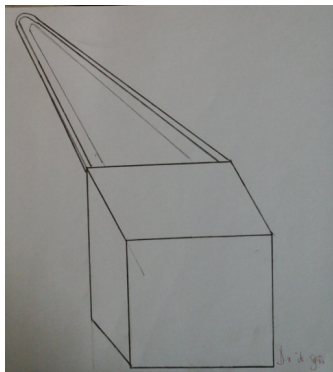

Plate 18: Sample practical works on one- and two-point perspective by pupils who were taught without instructional resources

In KNUST SHS, the teacher articulated that the resources made it easy to explain the concepts in perspective to the students because the resources presented them with clear pictorial explanations. This enabled the students to answer verbal questions asked during the lesson very well and also demonstrated their understanding of the lesson through the assignments they did as seen in Plate 19. This teacher commented that "Without the use of instructional resources, the lesson becomes abstract and boring as I do a lot of talking to explain the concepts" (personal communication, May 20, 2014). Plate 20 show samples of practical works produced by students who were taught without instructional resources.

Plate 19: Sample of works on one- and two-point perspective by KNUST SHS students who were taught with the instructional resources

Plate 20: Sample of works on one- and two-point perspective by KNUST SHS students who were taught without instructional resources

Resources Developed for Teaching 'Figure Drawing' from Waste Materials
   1.   **Resources for Teaching 'Figure Drawing' in Junior and Senior High School**

Plate 21: Resource for teaching the 'male and female figure'

Teaching Figure Drawing Lesson with the Developed Instructional Resources
In this KNUST SHS lesson, the teacher commented that "The resources in parts helped the students to draw the parts of the human figure easily and correctly but when they were asked to join the parts together in correct proportion, some students found it difficult to do that. After some practice the students were able to draw the human figures more proportionately and they were also able to draw posed figures" (see Plate 22). The teacher attested that the sample resources helped and made the teaching and learning easier than teaching figure drawing lesson without the resources. In comparing the students' drawings made when taught with and without the sample instructional resources (see Plate 23), the teacher mentioned that anyone can tell the difference the tested instructional resources made in his class. Commenting further, the teacher said "Instead of the normal 12 periods for teaching figure drawing lesson, only 6 periods was used this time". The resources were useful for teaching the lesson (personal communication, May 27, 2014 and July 08, 2014).

Plate 22: Sample drawings of posed figures by KNUST SHS students who were taught with the instructional resources
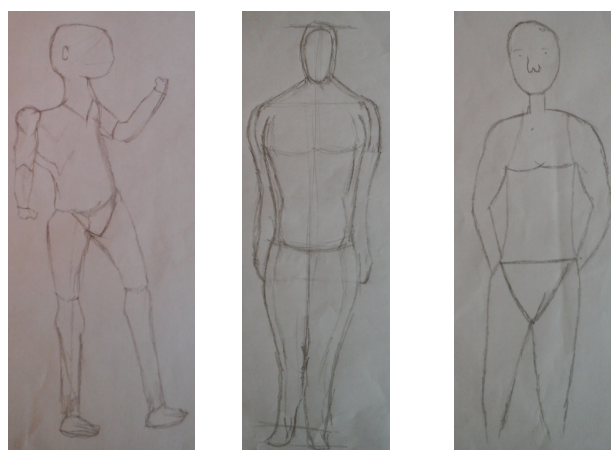

Plate 23: Samples of figure drawing works by KNUST SHS students who were taught without instructional resources

Instructional Resources Developed for Teaching 'Elements and Principles of Design' from Waste Materials
  1. **Resources for Teaching 'Elements and Principles of Design' in Primary School**

Plate 24: Resource on 'dot'

Plate 25: Resource on 'line'

Plate 26: Resources on 'texture'

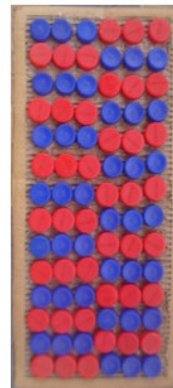**Plate 27: Resource on 'shapes and forms'**   **Plate 28: Resource on 'value'**

Plate 29: Resource on 'space and proportion'   **Plate 30: Resource on 'repetition'**

Plate 31: Resources on 'symmetrical and asymmetrical balance'

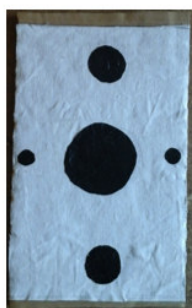Plate 32: Resource on 'variety'

Plate 33: Resources on 'contrast'

2.   Resources for Teaching 'Principles of Design' in Junior and Senior High School

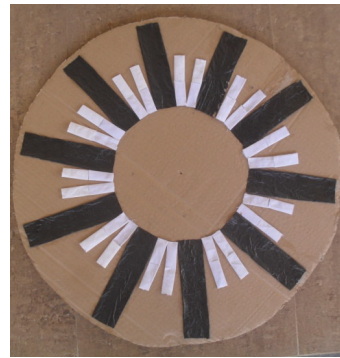Plate 34: Resources on 'symmetrical and asymmetrical balance'

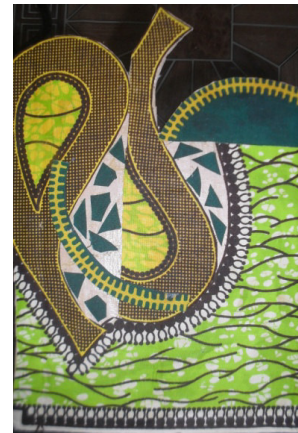**Plate 35: Resources on 'movement, rhythm and repetition'**

Plate 36: Resource on 'unity'   **Plate 37: Resource on 'harmony'**

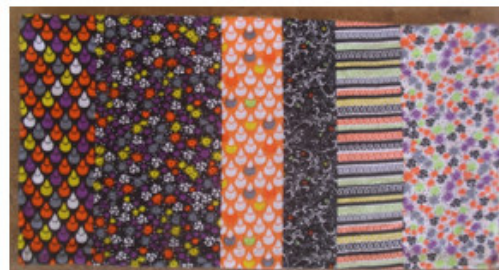**Plate 38: Resource on 'contrast'**   **Plate 39: Resource on 'dominance'**

Plate 40: Resource on 'emphasis'   **Plate 41: Resource on 'variety'**

Teaching Elements and Principles of Design Lessons with the Developed Instructional Resources

In Emena Primary School, the teacher reported that the resources prevented her from talking too much to explain the 'elements and principles of design' to the pupils. The teacher's comments were "The instructional resources made the pupils to think critically and participate in the lesson through discussions which helped them to get the understanding of the lesson. Teaching the lesson without the use of instructional resources makes the teaching more teacher-centred because the teacher alone would have to talk a lot to try and make the pupils to understand the concepts rather than the teacher and the pupils developing discussions out of the lesson". According to this teacher, "The resources helped to enhance the understanding of the pupils because they were able to use the elements of design based on balance and repetition to design well planned patterns excellently than previous lessons that I taught without using instructional resource. The instructional resources really did the trick, these are the kinds of things we need for teaching such lessons; the resources achieved their purpose" (personal communication, October 15, 2014). Plates 42 – 43 show samples of pattern work based on the elements and principles of design produced by pupils who were taught with the resources and those who were taught without instructional resources.

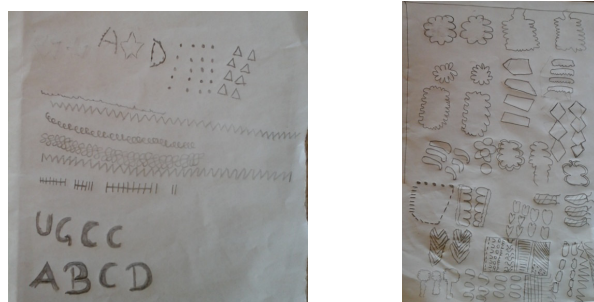**Plate 42: Samples of pattern work by the pupils who were taught with the resources**

Plate 43: Samples of pattern work by pupils who were taught without the resources

In KNUST JHS, the teacher reported that "It was very straightforward using the resources to teach in-terms of explanations, because the resources were very practical and made the pupils to understand the principles better. The resources helped to involve the pupils in the lessons to offer their contributions. Using the resources to teach strengthens the understanding of pupils better than not using them. The Ghana Education Service must therefore provide such resources for teachers to use in the classroom to improve teaching methods and enhance the understanding of pupils on what they are taught". This teacher also explained that the resources did the job they were meant for excellently (personal communication, January 27, 2014 and January 28, 2014). Plates 44 - 45 show samples of practical works made by pupils who were taught with and without instructional resources.
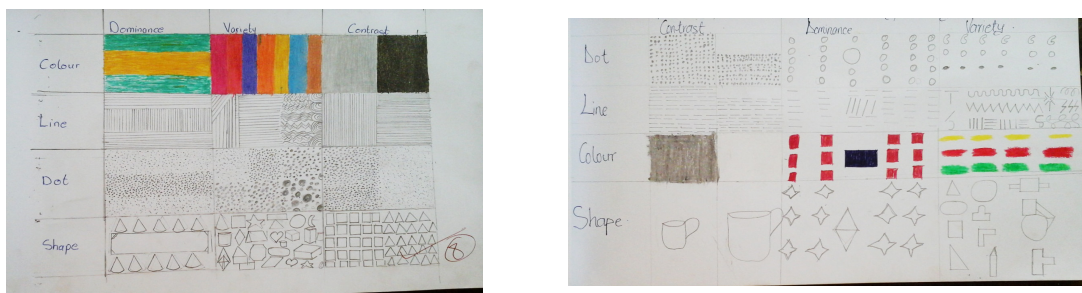

Plate 44: Sample practical work on 'organising the elements of design according to the principles of design' by a pupil from lesson taught with the instructional resources
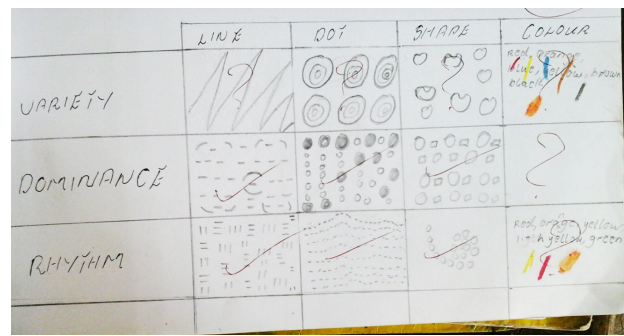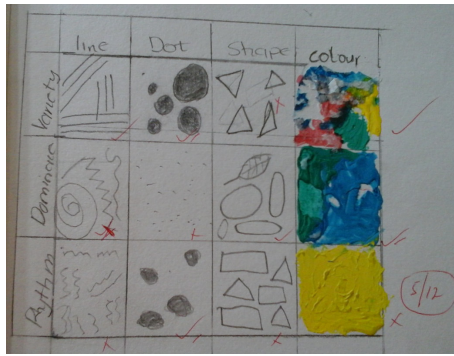
Plate 45: Pupil's work from lesson taught without instructional resources

In KNUST SHS, the teacher explained that the presence of the sample resources made it easy for the students to understand the explanations that he gave them on the 'principles of design'. The students were able to identify the principles of design that had been demonstrated in the resources. According to the teacher, the students' understanding of the concepts "Showed in the answers they gave to questions that were asked during the lesson which made teaching the lesson very easy. The answers the students gave to the questions showed that the resources enhanced their understanding more than the students I had taught on several occasions without using any instructional resources. Teaching with the resources was better because all the students in the class got involved with the discussions and answering of questions as against teaching the lesson previously without instructional resources when just a handful of students would get involved in the lesson" (personal communication, February 20, 2014).

Resources Developed for Teaching 'Weaving'
1. **Resources for Teaching 'weaving' in Primary and Junior High School**

Plate 46: Resource for plain and double plain weave

Plate 47: Resource for 2:2 right twill and 3:1 left twill weave

Plate 48: Resource for herring bone twill weave

Plate 49: Resource for diamond twill weave

Teaching Weaving Lessons with the Developed Instructional Resources
In the Primary One class at Emena School, the teacher's comments were "The resource made the pupils to see what they were supposed to do and after teaching them how to do the 'plain weaving', they were able to do it. Previously I was not teaching this lesson because I did not know how to do the plain weaving and I did not have any resource to use and teach with" (personal communication, June 23, 2014). Plate 50 show samples of the pupils' works.

Plate 50: Samples of Emena Primary One pupils' work on 'plain weaving'

In the Emena Primary Six classroom, the teacher expressed that "With the help of the resources on 'Weaving', all the pupils were able to grasp the plain weaving process easily and used it to make their works. Some of the pupils were able to complete their works very fast and assisted their colleagues to complete theirs. Previously some of the pupils could not do their works correctly but for this lesson all the pupils were able to do their weaving works correctly". This experience made the teacher to articulate that "Ghana education service must provide resource persons to train teachers like me on how we can produce instructional resources for teaching" (personal communication, January 30, 2014). See Plates 51 and 52 for samples of pupils' works.

Plate 51: Samples of pupils works on 'plain weaving' from lesson taught with the instructional resources
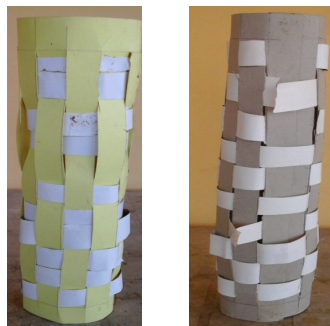

Plate 52: Samples of 'plain weaving' works by pupils who were taught without instructional resources

At Kentinkrono JHS, the teacher commented that "The resource served as a guide for me in teaching the twill weaving processes. Without the resources it would have been very difficult to teach the weaving process. With the resource on-hand the teaching process was easy because during the lesson for instance, when I said 'under the warp or over the warp' the pupils' saw exactly what I was talking about with the help of the resource. The instructional resources served their purpose as teaching and learning materials". The pupils were able to make wall hangings using twill weaves in the end as shown in Plate 53. This teacher made it known that he has not been teaching lessons on weaving because of the lack of art materials and instructional resources to use for teaching (personal communication, June 25, 2014).

Plate 53: Sample of 'weaving' works by Kentinkrono JHS pupils taught with the instructional resources

Analysis of Findings
Evidence from Observation of Lessons in which Sample Resources were Tested
From the observation, one key thing the researcher noticed from all the lessons in which the developed instructional resources were utilised was that, the pupils and students concentrated on the lessons as the resources were used to teach them. The learners' attention were captured and sustained during the lessons because they saw new things in their classrooms which were attractive and made from materials that are normally seen as litter in the environment. The level of concentration noticed in the lessons can give a teacher the confidence to carry out his or her lesson very well. At the Primary Schools in particular, the pupils shouted in excitement any time they saw the researcher enter their classrooms with instructional resources, and when a lesson was over some of them inquired when the researcher would return with more resources. This shows that the use of the instructional resources increased the pupils' enthusiasm to learn. This reaction of the pupils really showed that students prefer teaching methods supported with instructional resources to traditional methods of teaching (Yildirim, 2008). In effect, Ghanaian classrooms must incorporate the use of appropriate instructional resources in lessons to make learners enthusiastic to learn. Arousing the interest of learners in lessons in any discipline through the use of instructional resources is limited only by the ability of teachers to learn to recycle waste materials to create the appropriate resources they need.

Aside from the responses from students and pupils toward the use of the resources, teachers also responded positively to the use of the instructional resources. At the Primary and Junior High Schools where the resources were used to teach, teachers who were not initially contacted to test some of the resources contacted the researcher and requested to also use the resources in their classrooms. Obviously, if these teachers had instructional resources available in teaching their students, they would not have requested to also use the resources to teach. This confirms the finding that Creative Art, Basic Design and Technology and General Knowledge in Art are generally taught without the use of instructional resources in Ghana (Ampeh, 2011; Agbenatoe, 2011; Boafo-Agyemang, 2010; Owusu-Koranteng, 2009).

It was also observed in the schools that with the use of the instructional resources, instead of the teachers simply presenting their lessons to the learners, they used the resources to develop discussions among their students and pupils. This situation helped the learners to express themselves by speaking out their thoughts, contributions and answers to participate in the lessons. Such a situation can motivate students and pupils who normally do not contribute in lessons to be able to also bring out their thoughts, since the discussion is based on a visual object which they can see. For example the testing of the teaching resources saw almost all pupils in some classes raising up their hands to answer questions during a lesson. Again, one senior high school teacher confirmed that previously without the use of instructional resources, it was very difficult to get students to contribute in class, but the use of the teaching resources made the students to ask a lot of questions and also contribute in the answering of questions making the lesson very interactive than he ever expected (personal communication, June 11, 2014). This confirms the assertion that the use of instructional resources enables learners to participate in the topic being taught by using the resources as reference to illustrate their thoughts and ideas (Igbo & Omeje, 2014). It was also realised that the use of the instructional resources involved the learners in the lessons in which they were used as the teachers called them to come to the front of the class to interact with the instructional resources by using them to answer questions or to explain a concept. As instructional resources are used to make learners stand in-front of their peers to express themselves, it helps to build their confidence in their ability to articulate their thoughts to an audience. This in effect can help develop and grow the linguistic intelligences (Fierros, 2004) of students to make them excellent public speakers.

Furthermore, with the use of the resources, lessons that requested the learners to do practical works in the classroom saw all individuals in the classroom enthusiastically and actively working to create their works. Onasanya (2004) explains that when instructional resources are carefully selected, they ensure learners'

participation in lessons through discussions, projects, dramatization and the like. This then means that the ability of the instructional resources to engage learners in discussions and also helping them to actively engage in practical works attests to the appropriateness of the sample resources for teaching the lessons for which they were developed. This also proves that waste materials can be recycled to create appropriate instructional resources for effective teaching and learning of Art at Primary, Junior and Senior High Schools in Ghana.

Evidence from Interviews held with Teachers Who Tested the Sample Resources
Feedback communicated by the 14 practising Art teachers who tested the sample instructional resources by using them to teach the target topics made it clear that the resources served their intended purpose very well. The teachers said the instructional resources made their job easier because the resources enabled them to teach their pupils and students with real items and objects that focused on the content they needed to teach in their lessons which helped the learners to grasp the concepts that they were taught with ease. The idea is that using the sample resources made lessons taught by the participating teachers concrete and not theoretical as they used to do. The fact that the use of the sample resources made their lessons meaningful corroborates Alobo's (2010) assertion that using instructional resources helps to vividly illustrate meanings of things for an instruction. Similarly according to Okobia (2011), Ikerionwu (2000) also bring to the fore that indeed instructional resources are objects or devices which are supposed to help the teacher to make learning meaningful to learners, as these teachers are confirming. In agreement with Azikiwe (2007), Yildirim (2008) also affirm that in teaching and learning, instructional resources assume the role as supporting elements to concretize the knowledge or facts an instruction tries to put across. With the teachers attesting to the fact that the use of the sample resources made their lessons more practical and physical, and ensured effective teaching and learning situations in their classrooms reflects Edgar Dale's Cone of Learning Experience (Anderson, undated), which points out that the more practical a lesson is, the better the chance that many students can learn from it.

Furthermore, the teachers made it known that previously when they taught lessons without the sample instructional resources, their lessons turned out to be very theoretical and abstract, which made it very difficult for them to clearly explain the concepts they tried to teach in those lessons for their students and pupils to understand them. The teachers expressed that in this atmosphere they talk a lot in their effort to explain concepts, processes and techniques but sometimes, their efforts do not yield the required results, which is to make the learners comprehend what they are taught. However, with the use of the resources, it was very easy for them to explain concepts, processes and techniques for the pupils and students to understand them. As the teachers intimated, the resources made their work as teachers easy because the resources attracted and increased the attention of the pupils and students in the respective classrooms, they made the lessons lively and interesting, and motivated them to learn. This situation underlines Wathore's (2012) idea that instructional resources are used in teaching and learning to focus attention of students, to motivate learners' interest, to make learning more practical, exciting and lively. Ruis, Muhyidin and Waluyo (2009) adds that teaching resources help to increase learners' motivation to learn, reduce boredom in the classroom and make the teaching learning process more systematic. The teachers made it clear that the use of the instructional resources in teaching made the pupils and the students to participate in the lessons but teaching without the use of resources makes it difficult to get students and pupils to contribute in class. This means that the use of the instructional resources helped to involve the learners in the lessons.

Again, as the Emena Primary Six teacher who used the instructional resources on 'perspective' commented, the resources made it unnecessary to take the pupils out of the classroom to use the road as a means of seeing 'perspective' as reality or for further explanations on the concept. Okobia (2011) attest to such a situation by asserting that instructional media can be used to depict everything outside of the classroom. The KNUST SHS teacher who tested resources on 'Colour' and 'Figure Drawing' made it clear that teaching with instructional resources takes fewer periods to teach than teaching without instructional resources (personal communication, June 09 and July 08, 2014). To Wathore (2012), instructional resources are used in teaching and learning to save teachers' time for presentation. Also because of the attractiveness of the resources, they helped to boost the morale of the pupils in doing their practical works. In the view of Alobo (2010), the physical features of learning resources are a very important factor in their selection and use. The interviews brought to the fore that some of the Creative Art and Basic Design and Technology (BDT) teachers had never taught lessons on 'weaving' and were doing so for the first time although 'weaving' is a requirement to be taught in the syllabus. The teachers were not teaching the lessons because they lacked the skills to do the weaving, instructional resources were not available, and they lacked materials teachers and students could work with. Here the instructional resources and the idea of using waste materials helped to remove the obstacles that prevented the teachers from teaching the lesson.

Over all the teachers acknowledged that the students and the pupils understood what they were taught better with the use of the sample instructional resources because during those lessons, the learners were able to answer verbal questions very well than in previous lessons they taught without the use of the resources. The

teachers who made the learners do written tests and practical works also acknowledged that the learners performed better than was previously the case when they taught the same lessons without using any resources. It is clear from the teachers' communication that the resources improved their teaching outcomes in line with Yildirim's (2008) assertion that when instructional resources are included in educational programmes, learning improves. Moreover, all the conditions that the teachers cited as a result of using the instructional resources were all positive situations that helped to improve and enhance teaching and also reflected successful learning and academic performance of the learners in both the theory and practical lessons. On the other hand, the scenarios the teachers described as a result of teaching lessons on the same topics without using any instructional resources were all situations that negatively affected teaching, learning and the learners' performance.

The teachers' description of teaching and learning situations with and without instructional resources attest to the fact that classroom use of appropriate instructional resources is a very important aspect of education and for that matter if such resources are not used for teaching and learning it takes away a lot of important ingredients in the educational process. The underlying principle is that the absence of instructional resources such as pictures, models or real objects makes it difficult for learners to understand communicated information. In particular, young learners usually lack the ability to assimilate concepts abstractly, making it imperative for their teachers to adopt the use of interactive instructional resources for their lessons (Aina, 2013; Adeyemo, 2010). Poor academic performance among learners might therefore be linked to the abstract nature of lessons taught in many classrooms (Recece & Walker, 2001). As Wathore (2012) and Ruis, Muhyidin and Waluyo (2009) have also emphasised, teaching and learning materials play important roles in motivating learners to develop high interest in the subject matter. They also improve the teacher's competency in lesson delivery and make it easy to achieve lesson objectives. This means teaching with instructional resources offers latitude for shaping lessons to students' interests and needs, thereby enhancing the potential of these teaching strategies to be realised in the classroom (Igbo & Omeje, 2014). Simply put, the primary purpose of instructional resources is to make teaching and learning more effective and also facilitate it (Benson & Odera, 2013; Saglam, 2011; Azikiwe, 2007 as cited in Alobo, 2010; Scanlan, 2003; Naz & Akbar, n.d).

Conclusion

Considering the resources that were tested by using them to teach, the resources for teaching 'Colour' made the pupils and students to be involved in the lessons because the resources made the lessons very practical which helped the pupils and students to be able to answer questions on the lessons very well. The resources on 'Perspective' also made the lessons practical and real to the pupils and students which helped to catch their attention for them to concentrate on the lessons. This atmosphere made it possible and easy for the students and pupils to do practical works on the lessons correctly plus they were able to answer questions on the lessons very well. The resources on 'Figure Drawing' helped the students to draw the parts of the human figure correctly, and although some students found it difficult to join the parts of the figure together in drawing proportionately, after a month's practice the students were able to draw the human figure proportionately than previously when students were taught the lesson without any instructional resources. The resources on 'Elements and Principles of Design' made lessons interactive and involving for the pupils, students and teachers which helped the pupils to create correct and interesting practical works. With the use of the resources on 'Weaving', the pupils were able to create their practical works excellently as they saw what they were supposed to do with the help of the instructional resources.

From the testing exercise it became clear that when appropriate instructional resources are used for teaching and learning, lessons become more practical, interactive, interesting and real to pupils and students, which helps them to understand what they are taught better and enables them to achieve more in their academics (Igbo & Omeje, 2014; Nwike & Onyejegbu, 2013; Popoola, 1980 as cited in Oladejo, Olosunde, Ojebisi & Isola, 2011; Croft, 2000). As waste materials are used as instructional resources in teaching and learning it will help educate young learners on the fact that waste materials can be recycled to create other useful items instead of just disposing or burning them to pollute the environment.

Acknowledgements

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