

**PRACTICAL APPROACHES TO INSTRUCTIONAL MATERIALS PREPARATION
AT FOSO COLLEGE OF EDUCATION IN CENTRAL REGION, GHANA**

BY

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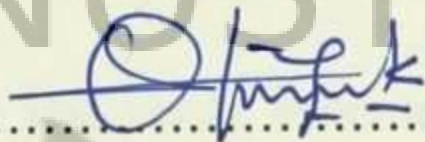
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DECLARATION

I hereby declare that this submission is my work towards the MA degree and that to the best of my knowledge, it contains no material previously published by another person or material which has been accepted for the award of any other degree of the University, except where due acknowledgment has been made in the text.

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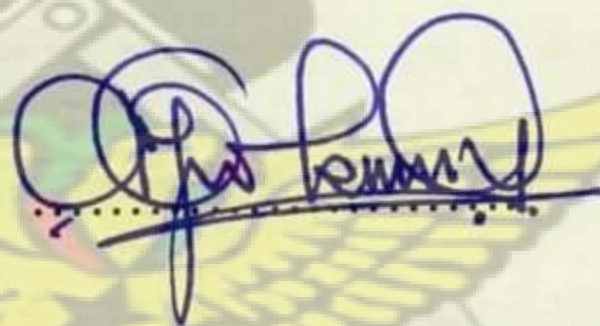
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ABSTRACT

The research explored the lettering, drawing and colour application skills that teacher trainees in Foso College of Education, in Ghana need to acquire in order to help them produce selected non-projected visual instructional materials. The premise was that teacher trainees need instructional materials (IMs) to help them communicate effectively, and also meet their learners' needs based on their abilities. The descriptive and action with questionnaire, interview and observation were used to collect data on practical ways in which teacher trainees can prepare instructional materials for teaching practice. Using a sample of 210 teacher trainees in Foso College of Education, in Central Region, Ghana. The study revealed that inadequate funding, lack of relevant practical artistic skills in lettering, drawing and colour; underutilized resource centres and the absence of a course on 'Teaching-Learning Materials development' to help the students to learn do this are some major reasons why teacher trainees find it difficult to make non-projected IMs. Inadequate funds, the absence of seminars for teacher trainees on IMs preparations, and logistical constraints are the crucial factors that affect the preparation and use of instructional materials among the trainees. In addition to this, many of the tutors in the training college do not teach the practical techniques in IMs preparation; the Colleges do not also use the IMs centres to teach the trainees to prepare their own IMs.

In this study, the sampled teacher trainees were taught mainly through demonstration lessons to enable them appreciate the fact that non-artists can also make IMs for teaching and thereby empowering them professionally through IMs preparation. The

posters, charts and picture cards that the sampled trainees prepared during the intervention points to the fact that, developing artistic skills can enable the trainees to prepare appropriate IMs and use them more effectively in teaching the outlined lessons.

To ascertain the effectiveness of the instructional materials the trainees prepared, selected samples were tested in two primary schools in the Assin Municipality. The study found that instructional materials aided the teaching and learning of Mathematics, Science and English language successfully to show the effectiveness of the posters, charts and picture cards that the lettering, colour work and drawing intervention exercise yielded for their intended purpose. It recommended that the National Council for Tertiary Education (NCTE), Ministry of Education (MoE), Teacher Education Division (TED) and Ghana Education Service (GES) should provide funds to support the Colleges of Education in Ghana, to enable teacher trainees acquire the needed materials for preparing IMs.

The NCTE, MoE, TED and GES should consider the repackaging and reintroduction of “Teaching Learning Materials” as a course to be pursued by all teacher trainees in the Colleges of Education.

In-Service training, workshops and seminars should be organized by the NCTE, MoE, TED and GES to orient tutors in Colleges of Education to acquire practical skills in IMs preparation.

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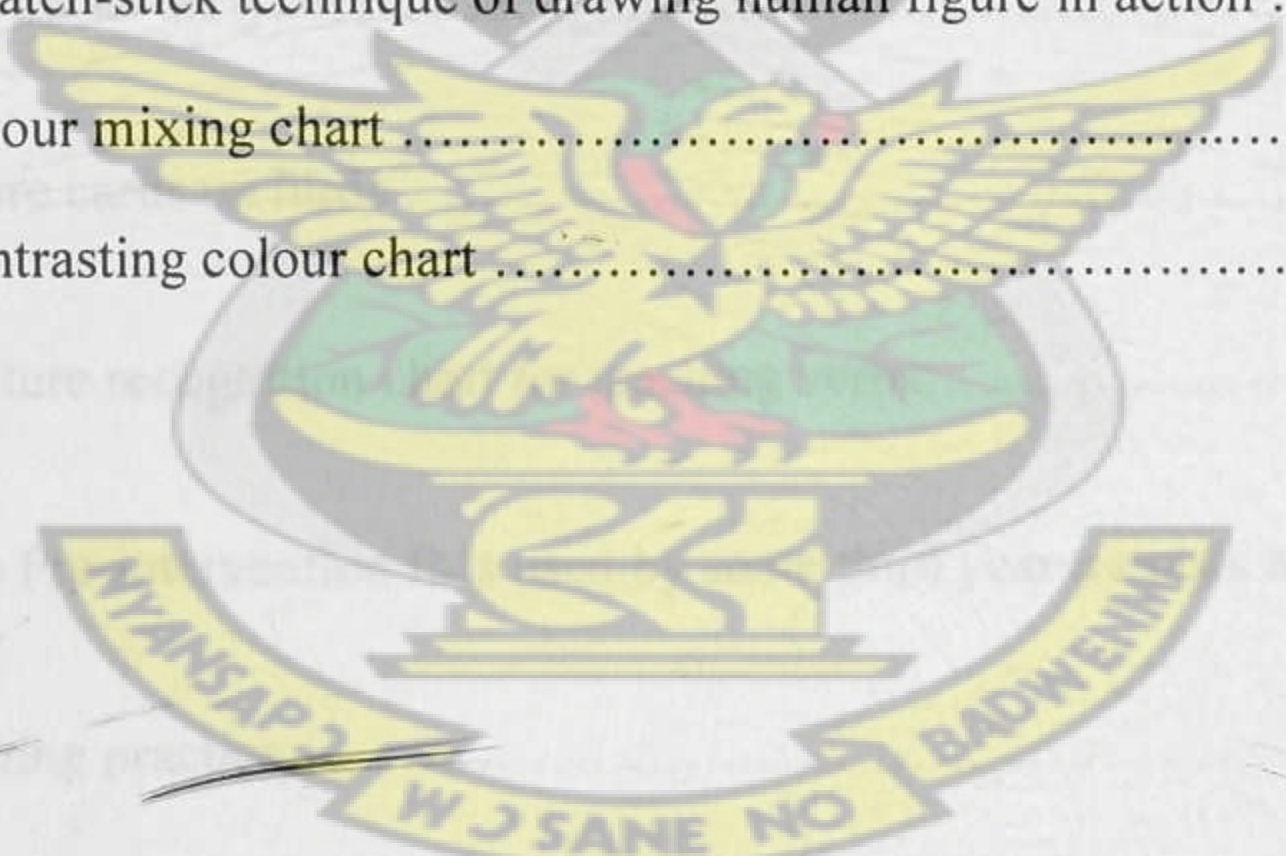
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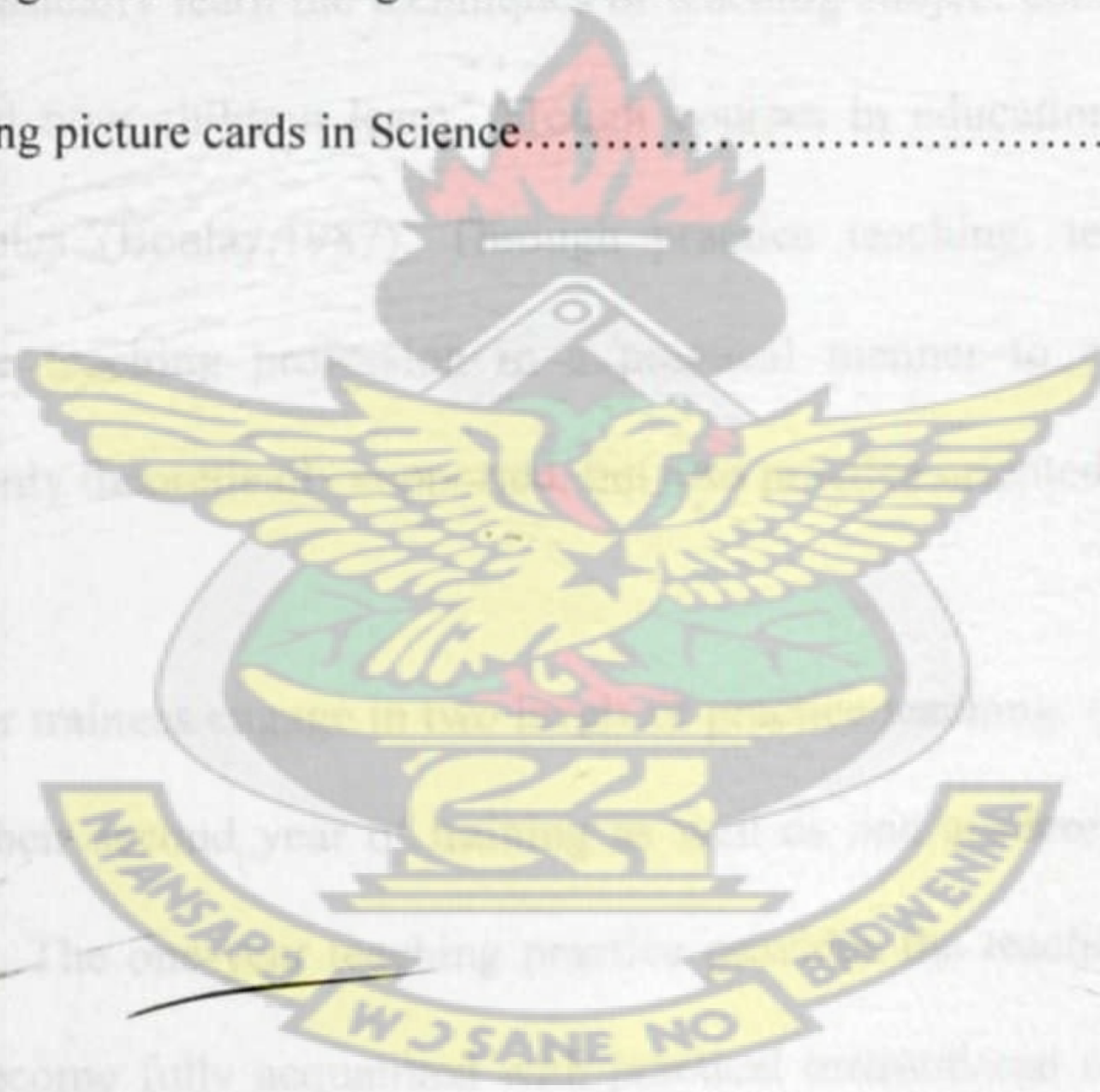
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CHAPTER ONE

INTRODUCTION

1. Overview

This chapter details the background to the study, the problem being studied and the objectives of the study, the research questions, the importance of the study and other relevant topics.

1.2 Background of the Study

Teaching practice is an important aspect of teacher education. In teacher education, teacher trainees basically learn the techniques of teaching subject content (pedagogy and methodology) and how children learn, through courses in education and the study of education principles (Boulay,1987). Through practice teaching, teacher trainees are introduced to the teaching profession in a practical manner to ensure that teacher education is not only theoretically supported, but also practice oriented.

In Ghana, teacher trainees engage in two levels of practice teaching: on-campus teaching practice during their second year of training as well as one academic year off-campus teaching practice. The one-year teaching practice provides the teacher trainees with the opportunity to become fully acquainted with practical instructional methods, the details of classroom procedure, control and relationship with students and the immediate matters of teaching materials, the syllabus, and methods of evaluation, among others (Apel, 1993).

Effective teaching practice is dependent on good communication between the teacher trainee and the learners. Verbal instruction, which seems to be the easiest form of instructional delivery, makes teaching very abstract (Onasanya, 2004). Since students enter school with varying degrees of abilities and potentials, and learn through different means (Farrant, 1996), teacher trainees need instructional materials to help them communicate effectively and meet the learners' expectations. Onasanya adds that educators have long recognized the intrinsic value of instructional media in teaching and learning processes. This recognition has engendered the inclusion of components of media education in teacher training programmes.

Instructional media, which consists of all forms of information carriers, can be used to record, store, preserve, transmit, or retrieve information for purposes of teaching and learning. They are materials used by practicing teachers and teacher trainees to present, illustrate, and clarify teaching (Agun and Imogic 1988). Instructional materials also refer to devices through which teaching and learning are done in schools. Examples of such materials include visual media, audio-visual media and real objects (realia). The visual aids are designed materials that may be locally made or commercially produced. They come in the form of wall-charts, pictures, flash cards, maps, calendars, clocks, sliders, filmstrips, pictorial materials, flannel boards, and two or three dimensional objects. The audio-visuals include radio, television, computers and all sorts of projectors with sound attributes. The real objects which are also called *realia*, includes preserved or live animals, leaves, flowers, old books, pictures, newspapers and musical instruments. The availability and use of teaching and learning materials affect the effectiveness of a

teacher's lessons. The creative use of a variety of media increases the probability that the student would learn more, retain better what they learn and improve their performance on the skills that they are expected to develop.

1.3 Statement of the Problem

Until the inception of the Three -Year Diploma in Basic Education teacher training programme in Ghana in 2005, a course titled "Teaching-Learning Materials Preparation", which aimed at equipping trainees with the needed skills for preparing instructional media for teaching was an integral aspect of the teacher training curriculum. This is no longer the case as this course has been taken out of the curriculum. This implies that the current batch of teacher-trainees have no means of receiving instruction on in the practical approaches to the preparation and use of instructional materials. The result is seen in reports submitted by teaching practice monitoring teams (the researcher included) in the colleges of education, which found that teacher trainees of Foso College of Education who were recently observed during teaching practice lacked the practical skills needed to prepare and use basic instructional materials (IMs) effectively. This negatively affect the teaching performance of the trainees who are expected to become fully qualified teachers. In view of this gap in pre-service education of teachers, among other things, many classroom teachers are unable to positively influence learning in Ghanaian primary schools (Opoku-Asare, 2000).

Another problem is that some schools visited on teaching practice supervision in the Assin district of Central Region, were flooded with foreign instructional materials which

in some cases were not in line with the Ghanaian basic school curriculum. This indicates that the respective classroom teachers in these schools lacked the practical skills in lettering, drawing and colour application which are needed for the teachers to prepare the instructional materials that suit their lessons effectively. As Olumorin (2009) emphasizes, it is when original materials are not available for use in teaching and learning that other types and forms of instructional materials can be applied. Abolade and Olumorin (2004) also report that most of the factory-produced non-projected visual instructional materials for teaching certain subjects are usually very hard to come by and where they are available, such materials are usually very expensive to buy. Some of the imported instructional materials have also been discovered to be concept-specific and based on foreign ideas and culture, while others are overcrowded with pictures and words. This means that teachers should resort to improvisation when conventional resources that suit their needs in their subjects are scarce.

Opoku-Asare (2000) also found that teaching and learning materials used in some Kumasi primary schools were based on foreign materials that made them, in some cases, unsuitable for delivering the local curriculum. The unsuitability of such materials meant for teaching English language in particular, are evident in the use of foreign objects such as Apple, Kite, Ladybird and Yacht to represent A, K, L and Y in the English alphabet. These objects are not familiar to many children in Ghana and therefore calls for charts that have good local substitutes such as Ant, kenkey, Leaf, Yam that classroom teachers can use to teach the assigned topics.

Though the Colleges of Education in Ghana do not currently teaching teacher trainees to prepare and use their own instructional materials, the literature on instructional materials point to their significance in teaching and learning and why they must be used. This study was therefore carried out to identify the skills that could be re-introduced into the college curriculum to equip teacher trainees to develop instructional materials suitable for teaching Mathematics, Science and English Language to seven to eight years old Primary Class 2 pupils.

1.4 Objectives

The study sought to:

1. identify and examine the factors that hinder the preparation of instructional materials by teacher trainees in Foso College of Education.
2. identify and describe the types of teaching-learning materials (IMs) that require lettering, drawing and colour application skills in their preparation.
3. demonstrate practical skills such as lettering, drawing and colour application to teach the teacher trainees in Foso College of Education IMs preparation suitable for teaching class 2 pupils in Mathematics, Science and English Language.

1.5 Research Questions

The study sought answers to the following questions:

1. What are some of the factors hindering the preparation of instructional materials by teacher trainees in Ghana's Colleges of Education?

2. Which types of teaching and learning materials require lettering, drawing and colour application skills in their preparation?
3. How can the demonstration method of teaching be used to teach lettering, drawing and colour application skills, to teacher trainees in Foso College of Education prepare selected instructional materials suitable for teaching basic two learners in Mathematics, Science and English Language.

1.6 Delimitation

The research is limited to the use of practical skills in lettering, drawing and colour application in the design and preparation of selected non-projected visual instructional materials by second year students of Foso College of Education in the Central Region, and not all the 38 public Colleges of Education in Ghana. It is also limited to posters, picture cards, cut-out numbers and letters, wall charts that could be used to teach Mathematics, Science and English language in Primary 2.

1.7 Limitations

The researcher encountered many setbacks during the study. The major limitation was the inability of some respondents to submit the answered questionnaires to the researcher, after visiting the schools on several occasions to collect them.

1.8 Definition of Terms

Instructional media	:	any relevant object, instrument or concept which a teacher uses to convey meaning to students.
College of Education	:	an institution that is mandated to train teachers.

Teacher trainee : a student in the college of education.

Teaching Practice : the situation where teacher trainees are assigned schools to do practical teaching for assessment.

Motor skill : the ability to perform a coordinated set of physical movements such as writing, typing, playing a musical instrument and sports.

Circulatory System : the combined function of the heart, blood, and blood vessels to transport oxygen and nutrients to organs and tissues throughout the body and carry away waste products.

1.9 Importance of the Study

The study can be valuable in the following ways:

1. It adds to the literature available on how posters, picture cards, cut-out numbers and letters, and wall charts can be designed and used for teaching the Basic School curriculum in Ghana.
2. It can help the Colleges of Education turn out teachers who have the requisite practical skills in instructional materials preparation, and how to use them to teach effectively towards national human resource development.
3. It provides material to help the tutors to guide the teacher trainees in instructional media preparation.
4. Educational policy makers, the Ministry of Education, Ghana Education Service and other agencies interested in instructional media use in education can use the report as relevant resource material to guide curriculum development in Ghana.

5. It serves as reference material for researchers, teachers and students.
6. It can empower teacher trainees in the College of Education in general, to become more productive as teachers who have expertise in the professional utilisation of instructional materials and therefore effective in curriculum delivery.

1.10 Organisation of the Rest of the Text

Chapter two reviews the related literature, which involves the critical selection of written material from other resources that are relevant to the study.

Chapter three discusses the methodology and the step-by-step method used to carry out the entire research. Chapter four comprises the results, analysis and discussion of the study. Chapter five summarizes the results of the research, draws conclusions and provides some relevant suggestions and recommendations.



CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Overview

This chapter reviews literature on types of instructional media and their use in the teaching and learning of pupils in primary school. The purpose of this chapter is to provide information on topics that are related to the topic of the study as follows:

- Instructional materials
- Types of instructional materials
- Advantages of instructional materials in teaching and learning
- Some guidelines for using instructional materials in teaching
- Teaching strategy for practical instructional materials preparation
- Factors hindering instructional materials preparation
- Practical skills needed in the preparation of instructional materials.

2.2 Instructional Materials

In an attempt to examine how learning takes place, it is realised that it will be impossible to learn anything without experiencing it in some way. Actually, words and other abstract media are used to present some experiences to make learning more effective. Ausubel (1973) as cited in Etsey (2005) states that young children are capable of understanding abstract ideas if they are provided with sufficient materials, and concrete experience with the phenomenon that they are to understand. This suggests that it is impossible to talk about foreign lands and distant planets if learners have not adequately experienced the land they live in and the planet on which they live. Such realistic experiences provide

the basis for learning from birth to old age. Where this is not possible, Farrant (1996) suggests using specially designed materials to make it possible for learners to achieve the required experience.

It is difficult to define instructional materials because different authors have assigned different names such as teaching aids, teaching apparatus, teaching resources to what is generally described as instructional media, or those materials that help the teacher to teach with ease and the learners to learn without stress (1996 Tamakloe, Atta and Amedahe. Olumorin, Yusuf, Ajidagba and Jekayinfa (2010) state that instructional materials are things that appeal to the senses of seeing, touching, smelling, feeling, and hearing. In effect, an instructional material is bound to transmit information to the learner through one or more of the human senses. Olumorin et al consider items and devices that teachers use in teaching as instructional materials. In another dimension, Opoku-Asare (2000) defines instructional materials as non-book materials, which are commonly known among Ghanaian teachers as “teaching aids” and “teaching apparatus”. This she says, ranges from published materials to basic “home-made” resources that teachers in Ghana use to aid teaching and learning.

Tamakloe, Atta and Amedahe (1996) consider ‘teaching resources’ as materials which the teacher uses to facilitate the learning, comprehension, understanding or acquisition of knowledge, concepts, principles or skills by students. They further explain that whatever the teacher prepares or uses to make learning easier than it would be without it, can be considered as instructional material. They imply that teachers have the responsibility to prepare and use instructional materials effectively to achieve their lesson objectives. If

teachers are to prepare materials for teaching and learning purposes, then it is critical for them to acquire certain basic skills such as lettering and illustration (Farrant, 2004).

According to Crockett and Foster (2008), teaching aids are things used in the classroom to aid teaching and learning, which falls into two main categories: visual aids such as posters, overheads; and interactive tools such as computer programmes, video programme or resource packs (books and materials on CDs and DVDs for self-learning). Craig (n.d.) also emphasizes that instructional media encompasses all the materials and physical means a teacher might use to implement instruction and facilitate students' achievement of instructional objectives. These may include traditional materials such as chalkboards, handouts, charts, slides, overheads, real objects, and videotape or film, as well as computers, Digital Video Disc (DVDs), Compact Disc Read-Only Memory (CD-ROMs), the Internet, and interactive video conferencing.

The different definitions cited shows that the term “instructional material” can refer to specific items used in a lesson delivery and includes various media formats that communicate information through the senses of seeing, touching, smelling, feeling, and hearing. As Gardner’s (1983) theory of Multiple Intelligences suggests, learners have different learning styles and so learners’ ability to acquire knowledge through the various channels of human senses is the best way to cater for the educational needs of all students. The idea is that teaching teachers to make basic posters, charts and other instructional materials for specific curriculum purposes require skills in lettering, drawing and colour work.

2.3 Types of Instructional Materials

There are several instructional resources that a teacher can select or create to deliver or augment instruction. Instructional materials consist of visual, audio and audio-visual formats but for the purpose of this study, the discussion is limited to non-projected visual materials.

2.3.1 Non-Projected Visual Instructional Materials

Alabama Department of Education (2003) states that visual media transmit information to learners through the sense of sight. This category of instructional materials includes all visual display materials that can be shown to a class, small groups or individual students without the use of optical or electronic projector. Non-projected visuals that might be available in the classroom or in the school's library or media resource center include chalkboards, multipurpose boards such as white boards, bulletin or display boards, graphic materials (drawings, charts, graphs, posters, and cartoons), still pictures (photographs, postcards, illustrations from periodicals and books), flip charts (commercially prepared or blank), maps and globes, models such as a replica of the human ear, that may be smaller, larger, or the same size as the real thing), and realia (real things including animals, plants, artifacts, coins, and minerals (Richardson, 2003). The following sections provide details of some of these resources.

a. Chalkboard

According to www.english.turkcebilgi.com/Chalkboard, a chalkboard or blackboard is “a reusable writing surface on which text or drawings are made with chalk or other erasable markers. Blackboards were originally made of smooth, thin sheets of black or dark grey

slate stone. Modern versions are often green or brown and are thus sometimes called a greenboard or brownboard instead". The chalkboard can be used to present instructional content as immediate sketchbook, and they are essentially temporary, for delineating ideas. When integrated with other media, they can give full explanation.

Neatness of the chalkboard must be ensured through the use of guidelines, templates, compasses and straight-edged rulers. Chalkboard should be divided into sections. Lettering should follow the occidental form of lettering; that is from the left sector of the chalkboard to the right, or only the middle portion of the chalkboard (Onasanya 2004). Chalkboard displays are written, printed or drawn on a dark-coloured surface, using chalk which is still one of the most widely-used of all visual aids. Notes and diagrams can be displayed during a lesson and for working through calculation and similar exercises in front of a class.

b. Markerboard

Marker board (whiteboard) displays are written, printed or drawn on a light-coloured surface using felt pens, crayons or other markers which can be used in the same ways as chalkboard displays, and have the advantage of being less messy and offering teachers the opportunity to use a wider range of colour markers. The same surface also can double up as a projection screen if necessary. Felt board displays are movable displays that are produced by sticking shapes cut out of (or backed with) felt or some similar material to a board covered with felt, or to a sheet of felt pinned onto a wall, which is comparatively cheap, highly portable and extremely useful display technique, especially in situations

that require the movement or rearrangement of pieces such as demonstrating table settings (Ellington, 1995).

c. Flipcharts

Ellington (1987) explains that flipcharts constitute large sheets of paper hung from an easel of some sort so that they can be flipped forwards and backwards in order to reveal the information on a particular sheet or produce a fresh blank sheet on which new information can be written or drawn.

d. Charts

Charts and wallcharts are large sheets of paper, carrying pre-prepared textual and or graphical and or pictorial information. Onasanya (2004) adds that charts are abstract representations of abstract relationships, like tabular charts, time line, and classification charts. Graphs are visual representation of numerical data, like polar graphs, scatter graph, and line graph. Ellington (1987) says that charts can either be used to display information during the course of a lesson or can be pinned to the wall of a classroom or lecture room in order to be studied by the students in their own time. Wall charts, in particular, can be extremely useful for providing supplementary study material or acting as a permanent aid memoire or reference system for learners; an example is the periodic tables of the elements that are prominently displayed in practically all chemistry classrooms.

e. Posters

Posters are similar to wall charts, but generally contain less information - often simply a single dramatic image which is useful for creating atmosphere in a classroom. Onasanya (2004) says that posters are useful graphic media using combination of lines, colour, drawings, symbols and texts that make teaching and learning more dynamic. Teachers are required to be equipped with the skill of lettering, colour application and drawing to make effective posters for instruction.

f. Still Pictures

Still Pictures are non-projected and non-motion pictures. They are photographic representation of people, places or things, and can be used to present information in all subject areas. They are readily available in magazines, calendars, illustrations from textbooks, newspapers, and so on. When still pictures are properly mounted on cardboard, with proper edges as individual pictures or in composite form, that is, combination of one or more pictures to produce a single visual, they can be used to pass across a wide range of information (Kemp and Smellie, 1989).

2.4 Advantages of Instructional Materials Teaching and Learning

A good aid is like a window; it should not call attention to itself, but must just let in the light. In general, the use of instruction media should facilitate learning or increase understanding of a subject matter. Communicating to facilitate learning can be a challenging process, often requiring creative efforts to achieve a variety of implicit instructional goals (Genhardt, 1982).

There are several inherent advantages in the use of instructional materials. Of special importance to the study are instructional materials which help clarify and illustrate concepts, arouse interest and provide variety, help learners to extend their imagination and experiences, and to retain knowledge. These points are explained as follows.

a. Clarification of concepts

Talabi (2007) explains that instructional materials are very useful because they enable the teacher to clarify concepts. In many instances, the teacher may be faced with the problem of explaining some difficult ideas with which students are not familiar. If the teacher has no instructional materials to use, he or she may resort to various unhelpful means to explain it. For example, a picture on the stages of the growth of a bean plant will help clarify the concept of plant growth, which will help learners understand and make progress in their work.

Talabi (2007) asserts that instructional media are generally designed to provide realistic images and substitute experience to attain curriculum goals. The media are considered the most efficient facilitators in the education set up. They are not substitutes for the teacher. Their use however, calls for an imaginative approach by the teacher who needs to constantly be on the alert for new ideas and techniques, to make the lessons presented with different instructional media achieve effective outcomes. According to the author, some devices are designed to present information of a kind that would not be available in an ordinary school experience. Examples include, films, television and sound recordings. Other types of instructional media have the function to help the pupil grasp the

underlying structure of a phenomenon. Visual media are primarily for seeing, audio devices for hearing and multi -sensory materials for use via two or more senses.

b. Illustration of Concepts

According to Farrant (2004), a good picture is better and more effective in explaining or illustrating a concept or point than several words of verbal communication. The idea is that pictures 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.

c. Arousal of Interest

Talabi (2007) asserts that instructional materials enable the teacher to arouse interest among students. 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 materials such as wall-sheets, models, specimens, sketches on blackboard, diagrams or even graphic symbols on flash cards or cardboard paper, students' interests are aroused. Such an interest propels students to learn and enjoy the lesson.

d. Assimilation of Ideas and Knowledge

Since visual illustrations are more accessible than mere words, they are effective in helping learners assimilate ideas and knowledge in the teaching and learning context. Learning aids reinforce the processes of learning by stimulating motivating and arresting the attention of learners (Adeyanju, 1988). Such learning aids include charts,

photographs, drawings and cartoons, which may be used in the learning environment or in a learning material such as textbooks to provide more concrete visual examples of subjects or ideas for learners.

e. Extension of Imagination and Experiences

Instructional materials help the teacher to extend students' imagination and experience far beyond the classroom. One of the biggest advantages of instructional materials is to bring the world into the classroom when it is not possible to take the student into the world. When a still picture of Akosombo Dam is properly mounted on cardboard, with proper edges, as individual pictures or in composite form, that is, combination of one or more pictures to produce a single visual, it can be used to help pass across a wide range of information (Kemp & Smellie, 1989).

f. Retention of Knowledge

Abimbade (1997) opines that using instructional resources in teaching and learning make students learn more and retain better what they have been taught, it also promotes and sustains students' interest. In addition, it allows the learners to discover themselves and their abilities. Instructional materials enrich learners' knowledge and reinforce verbal instruction. The uses of instructional materials help students to retain the knowledge they have acquired during the lesson. Pictures enhance retention. Instructional media help students visualize a lesson and transfer abstract concepts into concrete, easier to remember objects.

g. Improvement of Quality of Instruction

Owusu-Koranteng (2009) explains that the quality of learning can be improved through careful integration of pictures and words. Media can communicate elements of knowledge in a well-organised, specific and clearly defined manner. Through much effort from students, learning can be expected to reach an acceptable competency level.

h. Promotes and Widens Communication

Curzon (1997) points out that using instructional media in teaching widens the channel of communication between teachers and their learners. Instructional media allows the growth of specific learning abilities, and enhances intellectual skills and motor skills. The use of charts and models assist the teacher to present and illustrate many physical phenomena and issues easily, and at the same time, allows them to focus attention on the characteristics of objects.

i. Saves Teaching Time

The systematic utilisation of media in the classroom significantly saves teaching time as it takes the teacher a short time to explain concepts using instructional materials. This benefit could be in the form of students' achievements and saving of time spent on tasks. Media save teaching time as they require short-time to present large information (Abdelraheem and Al-Rabane, 2005).

2.5 Guidelines for Using Instructional Materials in Teaching

While the instructional value of media in enriching the teaching of students by teachers cannot be doubted, the media in themselves cannot assure good teaching. Their effective

use can be through their integration in teaching of lessons to trainees by their teachers. The following guidelines can be followed to ensure successful integration of media in practice teaching (Abimbade, 1997; Blyth-Lord, 1991; Talabi, 2007).

- a. A teacher trainee should consider the entire school environment as a laboratory for students' learning and the practical application of this knowledge. Therefore, instructional media selection, arrangement and re-arrangement of learning environment, and the use of materials and equipment to promote learning are basic in self-contained classroom (Onasanya, 2004).
- b. According to Onasanya (2004), media should be designed, produced, selected, or used as resources to attain specific instructional objectives. That is, objectives should not be tailored to the media; rather, objectives should guide media utilization.
- c. Media to be used by a trainee teacher should be considered in terms of concreteness or abstractness of experience which the media would produce. Teacher trainees should be sensitive to the changing situation within the classroom and have alternative media to meet individual needs or differences among learners (Onasanya, 2004).
- d. Evaluating the use of media can be done through observation, individual project, and use of questionnaire. The information from the evaluation can be used to improve on media usage in subsequent lesson (Onasanya, 2004).
- e. Instructional materials should be selected and used only if the teacher is convinced that they will contribute significantly to the objectives of the lesson. This means that instructional materials should not be used just for the sake of using them. If they are

not relevant or necessary for students' motivation and learning, they should be avoided completely (Talabi, 2007).

- f. Instructional materials should be current, not outdated or too old, or worn-out. They must contain just the necessary details.
- g. Instructional materials should always be timely. This means that during the lesson, they should be used at the most critical or important time when they are needed most, during the lesson. Some instructional materials are best used at the beginning to introduce the lesson and set the tone of the lesson. Some instructional materials are best used in the middle of the lesson to round up the points already made. Others still are best used at the end of the lesson to revise and conclude the lesson. The teacher should use professional knowledge to judge and decide when best to use instructional materials so that they will have the maximum or best effects on students' understanding (Talabi, 2007).
- h. Instructional materials should be accurate. Teachers should avoid using diagrams, pictures, charts, models and television programmes which have errors. The teacher must inspect and preview all media before using them. If there are no other media to use apart from the incorrect ones, the teacher should improvise some other ones for the lesson (Talabi, 2007).
- i. Instructional materials should be free from bias. Some films, pictures, or diagrams are politically, socially, or religiously biased against a particular group of people, race, region, occupation or religion. Such media should not be used because they can mislead students (Talabi, 2007).

- j. The choice and use of instructional materials should be appropriate for the age, lesson topic, culture and socio-economic levels of the students. Certain factors form barriers to effective communication so a teacher should be on the watch to ensure that these barriers never come into your use of instructional materials (Onasanya, 2004).
- k. Aids should be simple and compatible with the learning outcomes to be achieved. Obviously, an explanation of elaborate equipment may require detailed schematics or mockups, but less complex equipment may lend itself to only basic shapes or figures. Since aids are normally used in conjunction with a verbal presentation, words on the aid should be kept to a minimum. In many cases, visual symbols and slogans can replace extended use of verbiage. The instructor should avoid the temptation to use the aids as a crutch. The tendency toward unnecessarily distracting artwork also should be avoided (Anca, n. d.).
- l. Instructional aids should appeal to the student and be based on sound principles of instructional design. When practical, they should encourage student participation. They also should be meaningful to the student, lead to the desired behavioral or learning objectives, and provide appropriate reinforcement. Aids that involve learning a physical skill should guide students toward mastery of the skill or task specified in the lesson objective (Anca, n. d.).

2.6 Teaching Strategy for Practical Instructional Materials Preparation

Bruner (1994) explains teaching as the ability of a teacher to impart knowledge to a group of learners or to show the way something or a process is carried out. Teaching is also considered as any interpersonal influence which may be exerted by somebody

(teacher) and which is aimed at changing the ways and behaviour of a learner (Agun and Imogie, 1988). Teaching therefore concerns the activity of facilitating learning. To effectively impart the knowledge and practical skills of instructional materials preparation to a learner, teaching and learning strategies must be examined on purpose to identify those that will aid understanding and quicken skills acquisition in students (Sachs, 1999). Various instructional strategies are employed in the classroom when imparting knowledge and skills to a learner. One of such strategies for teaching practical skills in the classroom is demonstration, which is explained in the following sections.

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2.6.1 Demonstration Method

According to http://navyadvancement.tpub.com/14504/css/14504_27, the demonstration method of teaching skills involves showing students the step-by-step approaches to a task, using the exact physical procedures where possible. While demonstrating, it is good to explain the reason for and the significance of each step. To make the teaching effective, the teacher must plan the demonstration so that each of the steps is shown in the proper sequence and to include all steps. Talabi (2007) explains that during demonstration lessons, students watch the steps involved and listen to explanations. This he says gives students the opportunity to practice what has been taught so far, individually or in groups. Alternatively, the teacher may carry out the entire procedure before asking students to practice. The learners are made to repeat the procedure in a “hands-on” practice session to reinforce the learning process. By immediately correcting the learners’ mistakes and reinforcing proper procedures, they learn the task

more quickly. The direct demonstration approach is a very effective method of instruction, especially when learners have the opportunity to repeat the procedures.

Demonstration method is ideal for teaching a skill because it covers all the necessary steps in an effective learning order. The demonstration gives learners the opportunity to see and hear the details related to the skill being taught. The repetition in demonstration lessons helps the average and slow learners and gives the trainees an additional opportunity to see and hear the skill being taught. The performance step gives all learners the opportunity to become proficient in the skill being taught (http://navyadvancement.tpub.com/14504/css/14504_27).

2.6.2 Advantages of Demonstration Method of Teaching

a. Helps utilise several senses

According to Newby, Stepich, Lehman, and Russell (1996), demonstration in teaching helps utilise several senses such that students can see, hear, and possibly experience an actual event. It adds to learning by giving students the opportunity to see and hear how a process or principle is done.

b. Makes Lessons Practical

Talabi (2007) adds that demonstration offers practical examples to students, which helps to illustrate ideas, principles and concept for which words are inadequate.

c. Students get Concrete Experience

The demonstration steps give students the opportunity to see and hear the details related to the skill being taught, which according to Newby et al (1996), provide direct experiences for students which with the right tools and materials make the lesson real.

d. Reduce Hazards

Demonstration helps to reduce hazards before students begin to experiment or operate with materials involved. This ultimately leads to a reduction in trial-and-error incidences and unnecessary risks (Talabi, 2007). It is important to present ideas and concepts more clearly as this makes it beneficial in developing right skills and builds confidence. Demonstration makes lesson real with the right tools and materials.

2.6.3 Disadvantages of Demonstration Method of Teaching

- a. According to PreserveArticles.com (2011), teachers do not experiment with any other demonstrational methods apart from those given in the textbook prescribed. Oral discussion may not be encouraged, since it restricts the demonstration experiment.
- b. http://navyadvancement.tpub.com/14504/css/14504_27.htm states that demonstration method of teaching is of limited value for people who do not learn best by observing others. For example, a slow learner may never acquire the knowledge or skill the teacher will be trying to impart if he is impatient.

- c. According to <http://www.teach-nology.com/teachers/methods/theories/handson.html>, often, demonstrations will give students the main idea of how something works but places less emphasis on detail. For students hoping to attain the highest grades, they may need to read up on their subject to develop a deeper understanding of it. Students may feel after learning the basics they do not need to do any more study, which could impact negatively on their grades
- d. www.teach-nology.com/teachers/methods/theories/handson.html states that other topics may be hard to cover because of high costs. Less-endowed schools may not be able to bear such costs, the source adds.

2.7 Factors Hindering Instructional Materials Preparation and Use

As teacher trainees are equipped with the pedagogical skills necessary for the job, it becomes necessary for them to prepare instructional materials to augment instruction. Challenges that hinder teacher trainees' ability to prepare instructional materials are as follows.

- a. As a result of insufficient practical training, many teachers do not recognize the potentials of simple instructional materials available at very little cost, or how to fully utilize the materials even if they are freely given to them (Farrant, 2004).
- b. Bureaucracy and delay at the Ministry of Education in providing the needed financial and technical resources to provide the necessary media in educational institutions leads to lack of sufficient materials to use (Agun and Imogie, 1988), which prevents some basic visual materials to be procured and used by teachers in the classroom.

This is because creating quality instructional media can be costly. The crucial question asked by Dick, Carey, and Carey (2001) is: what level of media quality is acceptable in terms of time, cost efficiency as well as instructional effectiveness?

- c. Dick, Carey and Carey (2001) specify unavailability of materials as a major constraint. Using existing instructional materials can facilitate the creation of instructional units; however, if no appropriate materials exist, then the instructor must create the materials which usually lead to a production constraint.
- d. The computer and its accessories cannot work without electricity, therefore making their application in IMs preparation impracticable in places without electricity power.
- e. The complexity of some equipment such as computers and their accessories tends to frighten trainees that have little or no practical training in using computers.
- f. Teachers' responsibility to prepare and use instructional materials effectively to achieve their objectives depends on the acquisition of certain basic skills such as lettering and illustration (Farrant, 2004). The source adds that it is common for teachers to be so afraid of their lack of artistic ability that they never make the effort to use the chalkboard for the purpose of illustration.
- g. The attraction of sophisticated audio visual aids has caused some teachers to despise basic teaching aids.
- h. Planning lessons involving instructional materials can take considerable time and demands complex scheduling and resourcing. But rudimentary skills in lettering, drawing and colour application can encourage teacher trainees to prepare and use basic non-projected instructional materials for their lessons.

2.8 Some Practical Skills in Instructional Materials Preparation for Teacher

Trainees

In order to effectively produce Instructional Materials from locally-sourced materials, the teacher must have adequate skills. Some of these skills can be acquired through constant practice and observation of the experts (Olumorin, Yusuf, Ajidagba and Jekayinfa, 2010). That includes the basic principles and elements of design, pen lettering skill, calligraphy skills, free-hand writing, colour usage, drawing skills, modelling techniques, painting and weaving (Adeyenju, 2000, Abolade and Olumorin, 2004); Olumorin, 2004); and Farrant, 2004). The following sections describe the skills teacher trainees must learn in order to produce their own instructional materials.

a. Lettering Skills

Lettering, according to Olumorin et al (2010), traditionally can be done manually by using felt pens, and marker pens, spirit-based ink and brush, calligraphy pen, among others. In recent times, all of these have been jettisoned for computer lettering. It is now much easier to generate letters for illustrations, labels, titles and topics from the computer in various fonts and points (types and sizes). These can be printed out in any colour by using a colour printer on cardboard or any type of paper as the need may be. The printed materials may then be cut out and pasted on charts, boards, flannels and illustrations on cards for use as required. Letters can also be cut out from newspapers, magazines and old textbooks. The teacher only needs to select those that are appropriate and mount them on cardboards.

b. Drawing/illustration Skills

One of the major skills teacher trainees need to acquire is the art of free-hand drawing (quick sketches). As teachers, in the process of explaining certain points to the learners in the class, there may arise situations that warrant the need to quickly illustrate on the chalkboard. The teacher needs to acquire skills in making quick sketches using the “stick man” method. This is the simplest form of sketching without many details. “Stick” drawing uses very few lines to illustrate the point. The trainees only need to practice this several times before going to class.

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c. Colour

According to Olumorin (2000), colour is a very important aspect in visual materials production, this is because colour itself speaks. Misapplication of colour can mar the needed output of the material being prepared. The psychology of colour brings life and originality to prepared IMs when properly used according to colour classification and appropriate application of the principles, and elements of design. He explains that colours are classified as primary, secondary and tertiary.

(a) **Primary colours** are red, yellow and blue. These colours cannot be formed by the combination of any colour, hence they form the foundation on which other colours are derived. They are sometimes referred to as raw colours.

(b) **Secondary colours** are orange, green and purple. These colours are formed from the combination of two primary colours. They can be obtained as red-orange, yellow-green, red-purple or intermediate colours.

(c) **Intermediate colours** come from the combination of three or more colours. For example mixing one primary and one secondary colour often gives the hue compound names like red-orange and red-purple. The use of tertiary colours (russet, olive and citron) depends principally on expertise. One needs to understand the principles and elements of design such as harmony, contrast, rhythm and balance to be able to appropriately use intermediate colours along with primary and secondary colours.

Achieving harmony of colour implies the practical harmony of two or more colours, to create beauty. The use of yellow alongside green and ochre (brownish yellow) might be visualized as harmonious whereas the combination of green and red is the opposite. Contrasting colours are good in graphics especially when it has to do with lettering. Using black to write on yellow or white background is contrasting but it is good because such lettering will stand out and can be easily read from afar. This cannot be said of using yellow to write on a white background.

(d) **Neutral colour** - black and white are two colours that can only be used as they are or used to either tint (lighten) or shade (darken) other colours.

d. **Some effects of Colour on Learning**

Studies have shown that specific colours impact certain physical systems in the human body. According to Rossback and Yun (1992) as cited in Engelbrecht (2003), these systems are influenced by the following colours: *Motor Skill Activity* is influenced by red,

the *Circulatory System* by orange, *Speech Skill Activity* by green, the *Eyes, Ears and Nose* by blue and *Nonverbal Activity* by Violet.

According to the authors, people are very much aware of colour and its impact on how we operate in our environment. They indicate that colour psychologists have linked colour with brain development and the human transition from childhood to adulthood. Given its many impact and our unknowing responses, it is important to take a more studied stance of colour in the educational environment. It is not enough to simply provide colour through teacher decoration, school signs, and paint availability but it is necessary, to apply colour in a more constructive manner when preparing instructional materials in order to boost the achievement of instructional objectives.

2.8.1 Guidelines for Preparation of Non-Projected Visual Materials

The following steps outlined by Farrant (2004) can be adopted and used when preparing non-projected visual materials. A few simple materials, a moderate imagination and a lot of care are all one needs to set up in business as a visual aids producer.

a. Selecting Information for wall sheets, maps, charts and posters.

Overcrowding information is the commonest fault in producing effective wall sheets such as posters, pictures, charts and maps. Selecting information is essential if an impact is to be made, whether the material is in pictorial or written form. It is not worth producing a wall sheet and squeezing too much information on to that one sheet. As a rough guide, any wall sheet that cannot quickly be comprehended is not suitable for teaching in the class. It is better produced in an alternative form for group or individualized study. The

golden rule for maps and charts produced at home is simplicity. All outlines should be kept simple; choose the pictures with the least detail, keep the text to as few words as possible, and use only a few colours to create emphasis.

b. Layout

To ensure the necessary focus of attention on the content of a wall sheet (posters, charts and pictures), it is useful to think of two kinds of space, occupied or positive space and empty or negative space. The planning of both is vital. There should be enough empty space to make the information on the occupied space stand out, and the arrangement of the information in the occupied space should be carefully considered. Usually it will work out as a compromise between logical order and eye appeal. The layout of the finished chart should be planned in pencil before putting pen or paint to paper. Make good use of margins at the top, bottom and sides.

c. Cut-out images

Cut-out pictures to be used on a chart, should be tried in various positions and framed with paper to find out what size and position gives the best effect. Mark with pencil the position of the corners for ease in mounting later. When planning the layout for the title, ensure good symmetry, ensuring also that the margin before the first letter is equal to the margin after the last one. The title should be written roughly in pencil first to check spacing and spelling (Farrant, 2004).

d. Lettering

Legibility should be the key concern in lettering. It is important to choose a size and style that can be read easily from where the viewers (learners) will normally read it. Commercially-produced lettering aids such as stencils and letter transfer will produce professionally looking work. But most teachers will want to develop a style of printing that is easily read by their pupils and easy to produce with either chalk or felt tip pens.

e. Drawing

Unless one has artistic ability, it is usually best to make illustrations on chalkboard or homemade wall sheets by using simple line drawings or by means of diagrams or graphs for wall sheets. Pictures cut from magazines can also be used. Whatever the type, it is important to make sure the drawings or pictures are large enough to be seen by learners in the classroom.

f. Colour

Although the ability to make a harmonious choice of colours needs the genius of an artist, the following rules can be followed to help the amateur produce effective instructional materials using only a small range of colours.

- i. For brilliancy and emphasis, use a warm colour against a cool colour, or a dark colour against a light colour.
- ii. Use only as many colours as necessary. It is more effective to use only three or four colours than to paint with a dozen.
- iii. Harmonious effect is produced by choosing colours adjacent to each other on the colour chart.

Paint for charts can be obtained in transparent or opaque kinds. For classroom use, the opaque is better but care needs to be taken to prevent the powdery quality of some types from smudging or rubbing off when they are dried. This can be easily prevented by using mouth spray to apply a thin coating of fixative to the chart or wall sheet. An effective and inexpensive fixative is ordinary cow's milk. Where milk cannot be obtained a very diluted tree gum is effective.

Colouring large areas with a felt-tip pen or a paint brush designed for art is a slow and frustrating business, not to mention the cost. Cheaper and quicker methods include; using the flat edge of a stick of coloured chalk or a large paint brush designed for house painting. A very pleasing effect can also be obtained by spraying. In this process, screens of waste newspaper must be used to cover the areas where the particular colour being used is not wanted. The dyes used for dyeing cloth are the best colours for spraying in this way. Mix these as directed and then dilute with water according to the intensity of colour required. Colours for paints and sprays may also be obtained locally from earth and plants (Farrant 2004). For painting detailed work, it is ideal to use a brush or felt-tipped marker. Inexpensive brushes of any size or shape can be made from local fibres such as sisal or hemp bound with thread to a suitable piece of stick.

It can be deduced from the discussion that instructional materials are items and devices that teachers use in teaching which form an integral part of any effective teaching endeavour. They are classified into audio, visual and audio-visual, according to the way they appeal to the senses. The study discussed the various types of non-projected visual

IMs that teacher trainees can prepare and use in teaching practice. They make teaching interesting, help retain attention of pupils and illustrate ideas clearly to them. The guidelines for preparing and using IMs were also discussed touching on the teaching method suitable for teaching a practical lesson. This section also highlighted some factors that hinder instructional materials preparation. The practical skills needed in the preparation of instructional materials serve as a guiding principle for the preparation and use of IMs which serve as the basis for the practical preparation of non projected IMs by teacher trainees.

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CHAPTER THREE

METHODOLOGY

3.1 Overview

This chapter discusses the research design adopted in collecting data and describing the step-by-step approach used in developing and demonstrating the suggested practical ways of instructional materials preparation. The study was aimed at teaching teacher trainees practical skills in basic lettering, basic drawing and basic colour application as a means of producing selected non-projected visual instructional materials.

3.2 Research Design

Both qualitative and quantitative approaches were used. Qualitative descriptive research enabled the researcher to describe, record, analyse and interpret conditions that exist in the study area. This design also helped the researcher to study and give detailed account of the strategies employed in addressing the problems. In addition to this, the study also adopted the experimental research method and action research.

Leedy and Ormrod (2005) explains Qualitative Descriptive Research as a method which is used in describing, recording, analysing and interpreting conditions that exist. It involves some types of comparison or contrast and attempts to discover relationship between existing non-manipulated variables. Some form of statistical analysis was used to describe the results of the study.

To ascertain the practical skills which teacher trainees need to acquire in order to prepare non-projected instructional materials (IMs) suitable for teaching lower primary classes, and to describe the impact made on pupils in the classrooms where they were used in selected primary schools, the qualitative research was considered most appropriate for the study. The researcher also employed Descriptive, Experimental and Action research methods.

3.2.1 Qualitative Research

Shank (2002) defines qualitative research as “a form of systematic empirical inquiry into meaning” (p. 5). Denzin and Lincoln (2000) claim that qualitative research involves an interpretive and naturalistic approach: This means that qualitative researchers study things in their natural settings, attempting to make sense of, or to interpret phenomena in terms of the meanings people bring to them. Conger (1998), Bryman et al (1988), and Alvesson (1996) have outlined the following as some advantages of qualitative research.

- a. It allows the researcher the flexibility to follow unexpected ideas during research and explore processes effectively.
- b. It also helps the researcher to explore a phenomenon that has not been studied before adding rich detail and nuance that illustrates or documents existing knowledge of a phenomenon, generated quantitatively.
- c. It also helps the researcher to understand any social phenomenon from the perspective of the actors involved, rather than explaining it from the outside and to understand

complex phenomena that are difficult or impossible to approach or to capture quantitatively

- d. Qualitative methods in exploratory research and the use of open-ended questions and probing give participants the opportunity to respond in their own words.
- e. Findings from qualitative data can often be extended to people with characteristics similar to those in the study population, gaining a rich and complex understanding of a specific social context.
- f. Qualitative methods are effective in identifying intangible factors, such as social norms, socio-economic status, gender roles, ethnicity, and religion, whose role in the research issue may not be readily apparent.

In spite of the advantages of the qualitative method in research, it has some weaknesses. As it involves the use of small sample sizes, the method does not allow the researcher to generalize the data beyond the samples selected for the particular study (Owusu-Koranteng, 2009). However, the study adopted this method to obtain first-hand information on the factors that hinder instructional materials preparation and use by teacher trainees and observe the teaching and learning process with instructional materials usage in the selected local schools.

3.2.2 Descriptive Research

Shuttleworth (2008) defines descriptive research design as a scientific method which involves observing and describing the behaviour of a subject without influencing it in any way. It also involves the process of defining, classifying, or categorizing phenomena of

interest. Descriptive methods involve recording, analysing and interpretation of existing conditions. It makes no attempt to manipulate variables but compares and contrasts and attempt to discover relationships between non-manipulated variables. It helps to provide answers to the questions of who, what, when, where, and how associated with a particular research problem; a descriptive study cannot conclusively ascertain answers explaining why events occur. Descriptive research is used to obtain information concerning the current status of the phenomena and to describe "what exists" with respect to variables or conditions in a situation (USC Libraries, 2012). This method was used in the study to describe the various steps involved in the design and construction of teaching and learning materials.

3.2.3 Action Research

Action research is a process in which participants examine their own educational practice systematically and carefully using the techniques of research (Ferrance, 2000). According to Mills (2011), action research is done by teachers to understand their own teaching and students. The most effective action research results in opportunities to improve learning and engagement. Action research, can among other things;

- leads to positive change in the classroom and the school.
- offers professional development and continual improvement.
- provides opportunities for collaboration with colleagues.
- creates an opportunity to reflect on ones' own practice.

Through action research, teachers are focused on answering questions about improving some aspects of their teaching or their students' learning (Whitehead, 1998). Action research can also be a means by which teachers "derive meaning from current research within their own context, in a way which informs and explores their practice" (Carter, 1998, p. 275). This made the researcher to understand the problems that confronted the trainees in terms of IMs preparation and through collaboration between tutors and trainees, designed series of activities that helped the researcher to use demonstration lessons to teach the teacher trainees some artistic skills they needed in preparing IMs for effective teaching. This method allowed the researcher to directly bring on board trainees and tutors of the college in finding practical solution to the problem at hand. The selected tutors were involved to observe the progress of trainees through the study.

Action research is an inquiry-based approach to professional growth and school improvement in which teachers use research methods to identify questions about their practice, develop and implement appropriate changes, assess the impact of those changes, and share what they have learned with the profession as a whole (Wideman, Delong, Morgan and Hallett, 2003). This is evidence that real change in teaching and learning practices can be effected in classrooms through action research in order to build a knowledge base for the professional educator (Whitehead, 1989).

3.3 Library Research

Library research provided the bulk of secondary data for the study. The KNUST Main Library, The College of Art Library, The Department of General Art Studies Library,

(KNUST), and Foso College of Education Library were visited to collect the relevant literature on IMs preparation. Relevant Websites on the Internet were also used to source information for the study.

3.4 Population for the Study

A population is any group of individuals that have one or more characteristics in common that are of interest to the researcher. The population for the study consisted of a homogeneous group of 150 Second and 50 Third Year teacher trainees and 10 tutors of Foso College of Education in the Central Region.

3.4.1 Sample and Sampling Technique

According to Ross (2002), purposive sampling involves selecting members from a population to comprise a sample because they possess specific attributes of interest that address the purpose of a particular research problem under investigation. In this study, respondents were selected based on suitability and their ability to provide information relevant to the objectives of the study (Carson, Gilmore, Perry and Gronhaug, 2001). Purposive sampling was appropriate for this study because it helped the researcher to select a manageable number of trainees who could conveniently be trained using available materials and tools.

The purposive sampling technique was used to select the target population of 150 Second Year teacher trainees offering General Arts and Science and 50 Third Year teacher trainees. Ten tutors each of whom teaches one of the following subjects: Mathematics,

English Language, Education Studies, Science, Vocational Skills, Social Studies, Religious and Moral Education, Ghanaian Language, Physical Education and HIV/Aids, were sampled for the study.

The accessible population for the study comprised of 50 Second Year trainees (30 males and 20 females) 10 Third Year trainees also comprising six males and four females who went through the intervention training in instructional media preparation; and, 10 tutors who assessed the IMs prepared by the sample trainees: The tutors also assessed the trainees on teaching practice using new IMs. The 10 tutors who participated in the study had teaching experience ranging from six to 20 years.

3.5 Data Collection Instruments

The researcher, in collecting data made use of a questionnaires (see Appendix A) an interview guide (see Appendix B) and observation. The instruments were used to collect data on the teacher trainees' inability to prepare non-projected instructional materials for teaching practice, and the possibility of using practical teaching strategies to help solve the problem. Data were also collected through interviews with the selected tutors of the college. The researcher used the structured interview guide to solicit information the on trainees' inability to prepare IMs for teaching. Views of the tutors were recorded analysed. Appendix B is provided interview guide. The participants' responses were later analyzed and discussed.

3.5.1 Questionnaire

A questionnaire is a research instrument consisting of a formalized set of questions for the purpose of obtaining information from respondents. The main objective is to translate the researcher's information needs into a set of specific questions that respondents are willing and able to answer (Malhotra, 2004). Questionnaire provides a convenient way of gathering information from a target population. Questionnaire has advantages over some other types of research instruments in that they are cheap, do not require as much effort from the questioner as verbal or telephone surveys, and often have standardised answers that make it simple to compile data. Unlike in-person interviewing, there are no verbal or visual clues to influence a respondent to answer in a particular way. The questionnaire was used to seek the opinion of the Second and Third Year teacher trainees on the challenges they face in the preparation of IMs, types of IMs suitable for lower primary school pupils and to find out the practical skills needed by trainees in IMs preparation. The sample questionnaire used is shown as Appendix A.

The researcher distributed 200 copies of the questionnaire to the selected Second and Third Year teacher trainees in the College, with 150 copies going to the Second Year trainees while the Third Year group got 50 copies. In order to solicit effective responses from the students, the researcher made use of face-to-face contacts with the sampled trainees so that clarification could be given on items that were not clear or easy to understand. The questionnaire sought information on the factors that hinder instructional materials preparation by teacher trainees, the essence of lettering, drawing and colour application skills in IMs preparation, and the extent to which practical skills such as lettering, drawing and colour application could enable teacher trainees to prepare selected

non-projected instructional materials for use during teaching. It must be said that the 200 questionnaires administered had ninety-four percent return rate with only six percent lost.

3.5.2 Interviews

Interviews are particularly useful for getting the story behind a participant's experiences. The interviewer can pursue in-depth information around the topic. Interviews may also be useful as follow-up to certain responses to a questionnaire, in order to further investigate their responses. One drawback of using an interview procedure is that the data obtained may not be appropriate for extensive statistical analysis because they simply describe a construct rather than quantifying it (McNamara, 1999). The structured interview was used to seek the views of the tutors on the challenges they face in the preparation of IMs, types of IMs they consider suitable for lower primary learners and the practical skills they consider relevant to teaching the trainees in IMs preparation. Appendix B shows a copy of the interview guide.

A standardised, open-ended interview guide (see Appendix B) was used by the researcher. In this type of interview, the same open-ended questions were asked all interviewees. This approach helped the researcher to present same set of questions to the interviewees. The effectiveness of an interview depends on how it is structured. In other words, the interview should be thought out beforehand and standardised so that all participants are asked the same questions in the same order.

3.5.3 Observation

Observation is another versatile approach to data collection. In this study, the researcher used the participant-observer approach to allow for critical observation of the practical activities the teacher trainees engaged in as part of the intervention. Some of the major issues observed during the study involved the exhibition of drawing skills, lettering skills and colour application during the practical activities and at the time of presenting lessons while using the prepared IMs. The observation guide used is shown in Appendix C.

3.6 Types of Data Collected

3.6.1 Primary Data

The primary data were obtained largely from Second and Third Year teacher trainees, Tutors of Foso College of Education (Fosco), Fosco Demonstration Primary school and Assin Achiase Roman Catholic Primary school through questionnaires, interviews and observations.

3.6.2 Secondary Data

The secondary sources of data for the study were obtained mostly from works of other researcher in the area of Graphic Design and instructional materials as presented in journals, articles, reports and books. The researcher also got some of the information from the Internet.

3.7 Administration of Instruments

The researcher first sent a letter informing the Principal of the intention to conduct the project in the college. The researcher also explained the purpose of the research to the Vice-Principal (Academics) of the College, to seek his approval. Subsequently, a slot on the college's time table was requested for the study. Tutors in the college were also informed of the research to be conducted at the college. The questionnaire was personally distributed to 150 Second Year teacher trainees of the college. They were filled and returned the same day with the exception of a few who submitted theirs the next day. The researcher took a trip to nearby towns to distribute the remaining 50 questionnaire to some Third Year students on teaching practice in the Assin North Municipality and Assin South District respectively.

In all, 10 tutors of the college, including the Principal and Heads of Department, were interviewed to solicit their views on the study. The researcher first booked appointments with the tutors concerned for the intended interviews and used the structured interview guide during the interactions with the selected tutors.

The Third Year teacher trainees on teaching practice were observed on the types and quality of IMs they used in teaching while the Second Year teacher trainees were observed as they prepared and used IMs respectively. The observation guide prepared by the researcher was used during the observation of teacher trainees teaching and IMs preparation.

3.7.1 Validation of Instruments

The instruments selected were vetted by the supervisor and those found to be irrelevant were related and others were modified. The items in each questionnaire were carefully chosen to establish both face and content validity. After screening and vetting by colleagues and other people concerned, the instruments were finally approved by my supervisor for piloting. Subsequently, copies of the questionnaire was printed and administered to 200 students of Foso College of Education at Assin Foso. The objective of the pilot study was to find out how the students would understand the items and respond to them. Items that were poorly responded to were considered ambiguous and therefore reframed.

3.8 Data Collection Procedures

The teacher trainees were given questionnaire to seek their views on the challenges they faced in instructional materials preparation. The questionnaires also sought their views on alternative ways by which the challenges would be curbed through the demonstration of art skills in IMs preparation. The researcher taught the teacher trainees skills in lettering, drawing and colour work. The researcher also observed and recorded through photographs and observation check lists the trainees' efforts at preparing and using the IMs as expected. Trainees were assigned tasks to perform to assess their performance and progress of work. See Appendix C for the Observation guide used for the study.

3.9 The Intervention Project

The nature of the research demanded an action plan to guide the researcher to carry out the intended activities with the teacher trainees based on practical demonstration hands-

on lessons and activities that focused on lettering, colour application and basic drawing and presentation of lessons using the prepared instructional materials in teaching selected topics in English language, Mathematics and Science to pupils in Primary Two. The details of the activities of the demonstration lessons are described in the following sections.

Activity 1: Lettering Skills

Materials used: poster colours (white, black, blue, red and yellow), crayons, papers, newspapers, magazines, calendars, gentian violet, eraser and paper glue.

Tools used: painting/writing brushes, felt-tipped pens, markers, T – Square, metre rule, cutting knife, ruler and pencil.

Objectives expected by the end of the lesson were to:

1. make legible letters of the English alphabet to create non-projected instructional materials while critically observing letter and word-spacing;
2. arrange cut-out letters from newspapers, calendars, magazines and posters to add text to the instructional material made by gluing the letters to the surface of the paper.

A. Lettering Activity One: Making legible Letters of the English Alphabet

Tools and materials

Ruler, pencil, eraser, paper, brushes, paper, poster colours and gentian violet paint.

The objectives of this activity were to help the teacher trainees to:

- a. make pen strokes that could be developed into good lettering;

- b. write words involving capital letters by observing letter and word spacing;
- c. write words involving small letters by observing letter and word spacing;
- d. write words involving small letters such as 'y, j, g, q, p, f, t, k, b and d.

Procedure for making strokes with brush and broad pens to make strokes.

- i. Cut a piece of paper, plan the strokes in pencil so that mistakes can be corrected and try cursive, diagonal, vertical and horizontal strokes using writing tools such as marker pens to determine the width of its stroke on paper (See Fig. 1).



Fig. 1: Different sizes of strokes made from pens to determine width

Procedure for brushes and broad pens to writing capital letters.

- i. Cut a piece of cardboard paper measuring 7cm by 5cm.
- ii. Leave a margin around the card and rule three horizontal lines at equal intervals from the top margin to the bottom margin for writing words with capital letters only as shown in Fig. 2. Erase the constructional lines after writing the letters.



Fig. 2: A sample word card involving capital letters only

Procedure for writing capital letters with brush and broad pens.

- i. Rule four horizontal lines at equal intervals from the top to the bottom margins when writing words involving capitals and small letters such as **y, j, p, g** and **q**.



Fig. 3: A sample word card involving small letters.

- ii. Words without descendant letters such as **y, q, p, j** and **g** will need just three horizontal parallel lines such as the card below.



Fig. 4: A word card showing a word without a descendant letters.

- iii. Practice lettering skills with capital and small letters using paint brushes and felt/ marker pens.
- iv. Make word cards (flash cards) measuring 12 by 5 inches using any suitable paper, pen, marker pen, wax crayon of any type.

B. Lettering Activity Two: Using cut-out letters from newspapers, magazines and calendars to form words in lettering

Tools and materials

Razor blade, cutting knife, masking tape, ruler, pencil, eraser, paper, newspapers, magazines, calendars, glue, brushes, paper glue and poster colours.

The objectives of this activity were to help the teacher trainees to:

- a. identify sources of printed letters;
- b. cut-out letters from newspapers, magazines and calendars and organise them into words observing letter and word spacing;
- c. glue the cut-out letters to add text to instructional materials.

Steps involving the use of Cut-Out letters in IMs preparation

- i. Identify printed materials such as newspapers, posters and calendars and cut out some printed letters using cutting knife or razor blades from the newspapers, posters and calendars.
- ii. Select letters based on size, shape and colour to be organised into words as part of the instructional materials preparation.
- iii. Plan the layout of the lettering on the IM in pencil, to ensure its perfect alignment.
- iv. Apply thin coating of white glue with a brush at the reverse side of the cut-out letters, and gently paste the individual letters on the surface.
- v. Write headings or topic for the IM such as **Parts of a fish.**

3.9.1 Basic Drawing Skills

Topic: Relating geometric shapes to objects in the environment

Objectives: By the end of the lesson, the trainees will be able to:

- match some geometric shapes to some objects in the environment;
- draw simple shapes of objects out of the geometric shapes;
- render some objects in match-stick drawing;
- use cut-out images from newspapers, posters and other sources to make drawings of selected objects on paper.

Tools and Materials

Piece of latex cushion foam, ruler, pencil, eraser, paper, newspapers, magazines, calendars, brushes, pencils, markers, felt-tip pens, ink, paper glue, poster colours and tracing board.

A) Drawing Activity One: Matching geometric shapes to objects in the environment

- Draw some elements of design such as shown in Fig 6.

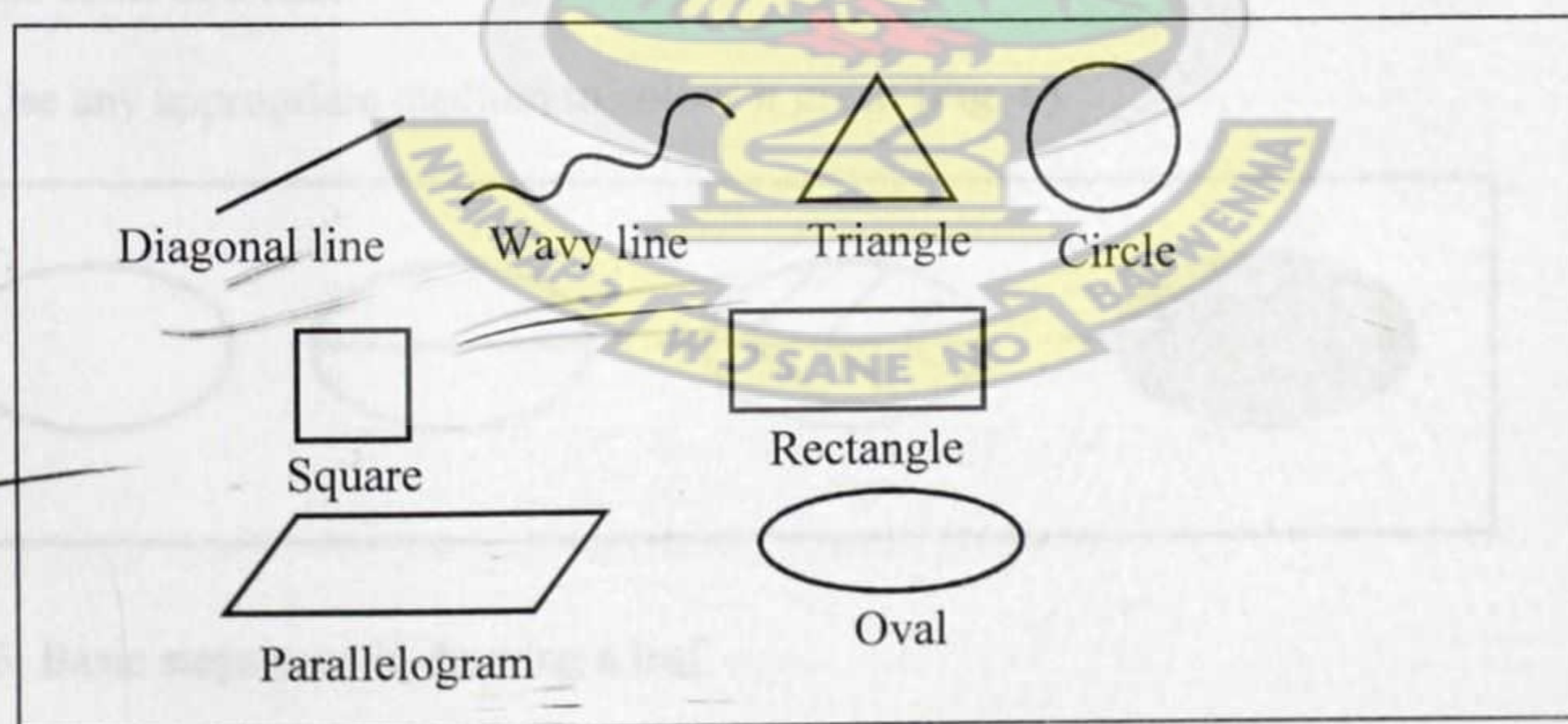


Fig.5: Some elements of design used in drawing

- ii. Relate elements of design to objects in the environment to determine their shapes as circle, oval, lines and triangles. (see Plate 1)



Plate 1: Computer generated elements related to objects

B) Activity Two: Drawing a Leaf

1. Draw an oval shape in a lateral manner using a pencil.
2. Draw a horizontal line from one end of the oval to the other end to divide it into two equal halves.
3. Draw diagonal lines from the horizontal line in the middle to the edges, to represent the veins of a leaf.
4. Use any appropriate medium to colour it green (Fig. 6).

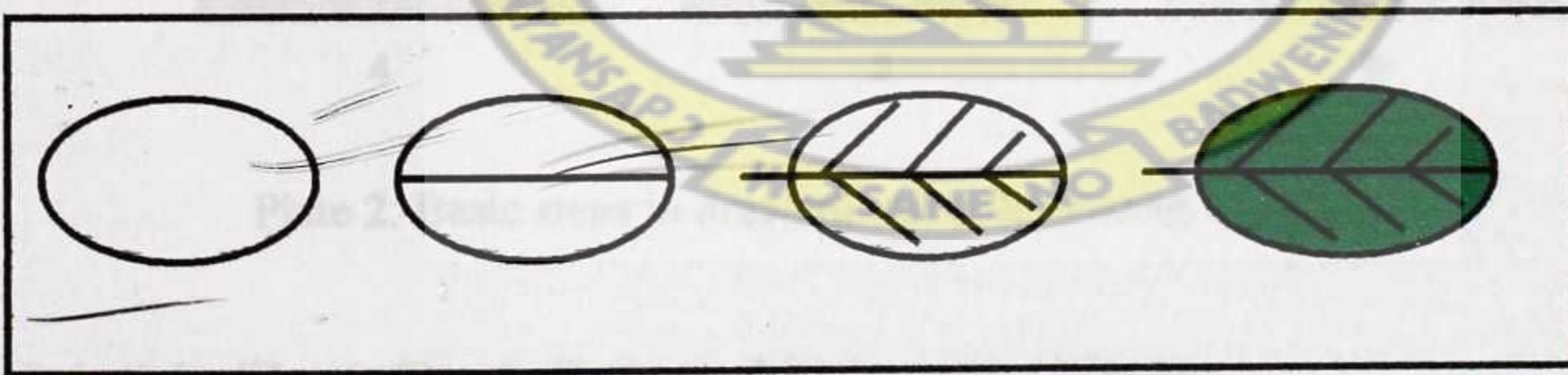


Fig.6: Basic steps used in drawing a leaf

5. Alternatively, pluck a leaf from a nearby plant or tree

6. Place it on a plain sheet of paper and use a pencil or pen to trace along the edges to create an outline.
7. Observe the leaf critically and add details such as veins, texture and colour to the outline drawing.
8. Use the same process to draw a flowering plant as shown in Plate 2.

Using the tracing method to draw a flowering plant



Plate 2: Basic steps in drawing using the tracing the method.

C) Activity Three: Simple Steps used in drawing a Flower

1. Draw a small circular shape using a pencil.
2. Draw oval shapes and stick them around the circular shape in the middle.
3. Draw a vertical line to represent the stalk of the flower.

3. Attach a leaf to the stalk using an oval shape.
4. Colour the flower using any suitable medium and colour.

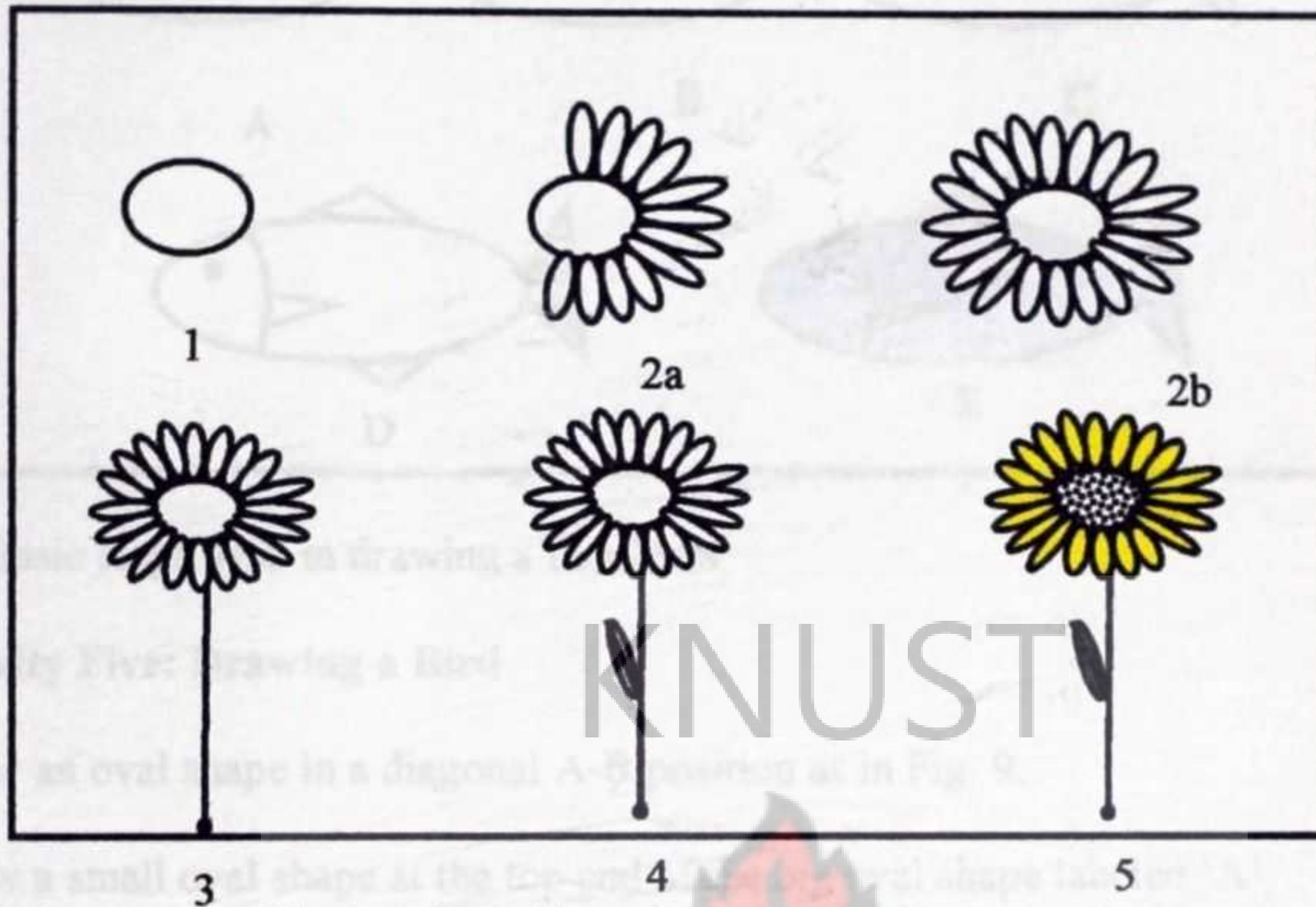


Fig.7: Basic steps used in drawing a flower

D) Activity Four: Simple steps used in drawing a Fish

1. Draw an oval shape.
2. Make a dot at one end to represent the eye of the fish.
3. Attach a triangle to one end of the oval shape as the tail.
4. Introduce the fins using triangles.
5. Apply a suitable colour to the drawing. See Fig 8.

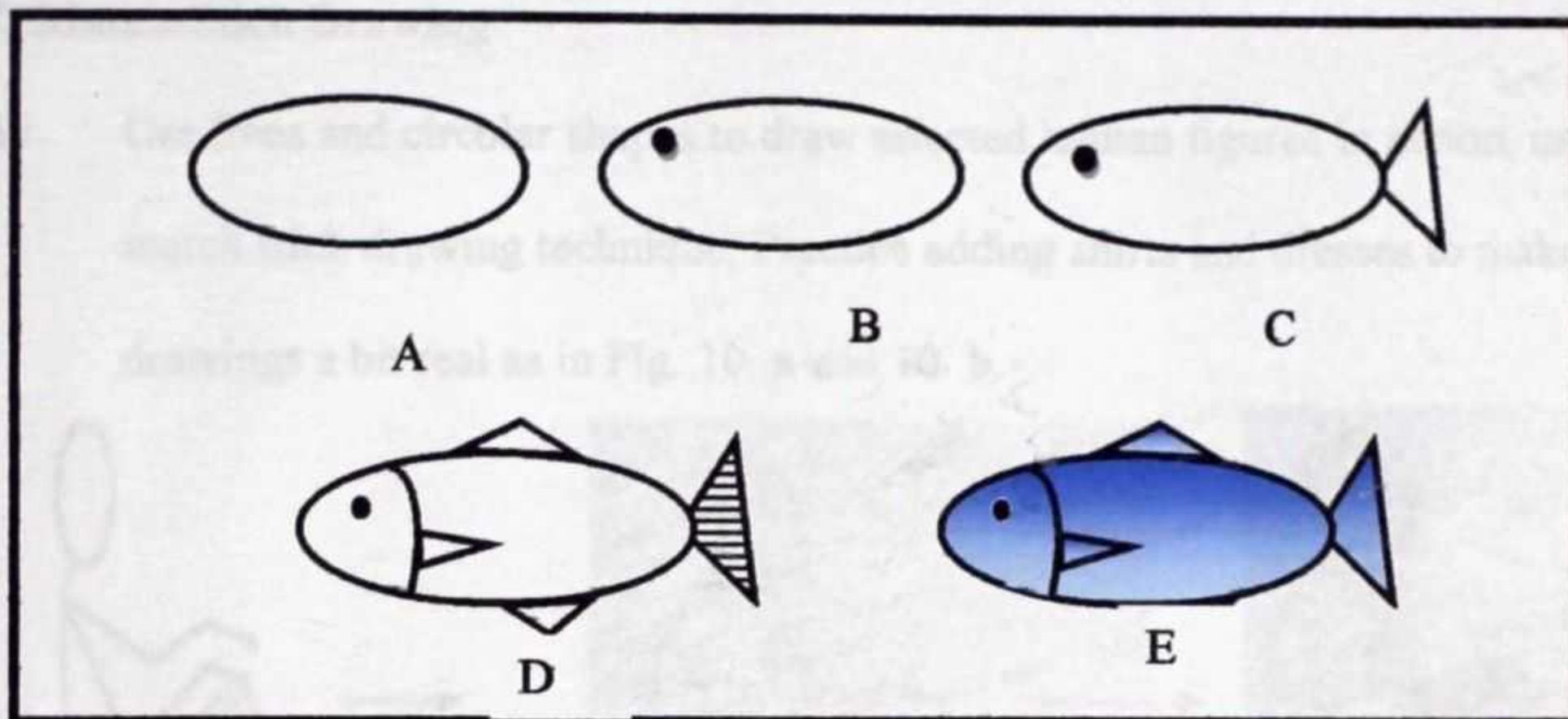


Fig. 8: Basic steps used in drawing a fish form.

E) Activity Five: Drawing a Bird

1. Draw an oval shape in a diagonal A-B position as in Fig. 9.
2. Draw a small oval shape at the top end of the big oval shape labeled 'A'.
3. Draw the beak of the bird using a small triangle attached to the small oval which is the head of the bird.
4. Draw a triangle attached to the 'B' part of the oval as the tail of the bird.
5. Draw two diagonal lines under the bird to serve as the legs and subsequently add the wing using an oval shape. Colour to make it attractive.

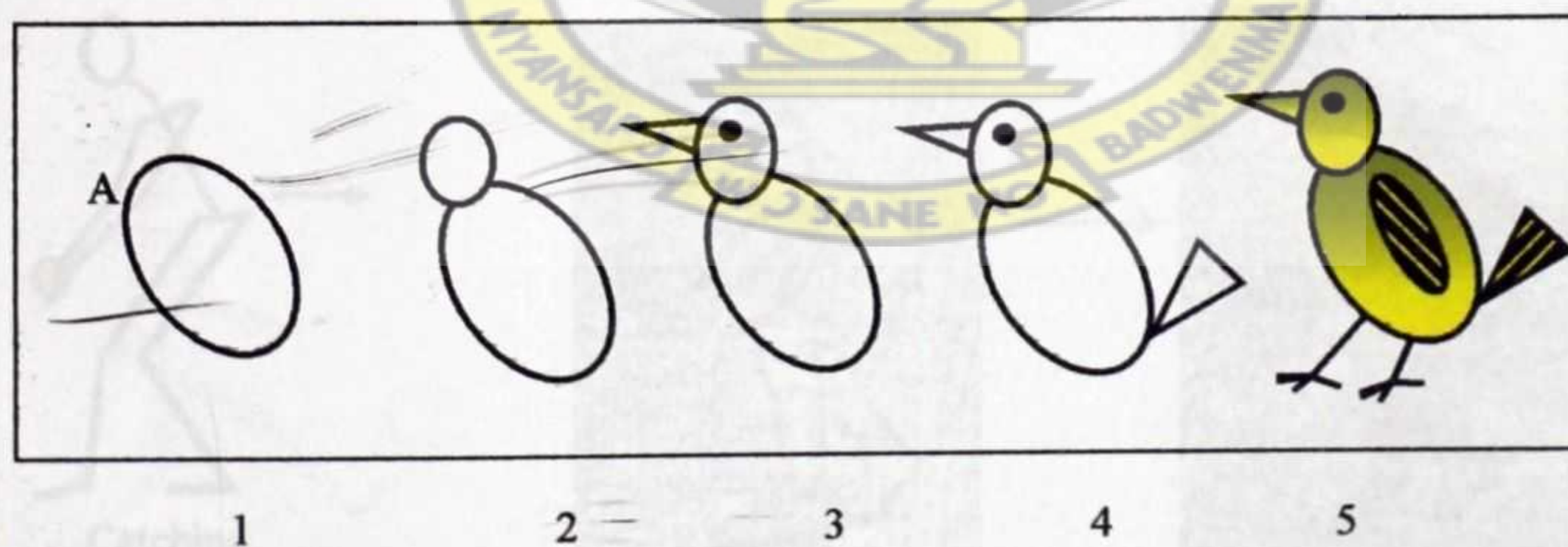


Fig. 9: Basic steps used in drawing the shape of a bird

F) Match-Stick Drawing

- iii. Use lines and circular shapes to draw selected human figures in action, using match stick drawing technique. Practice adding shirts and dresses to make drawings a bit real as in Fig. 10. a and 10. b.

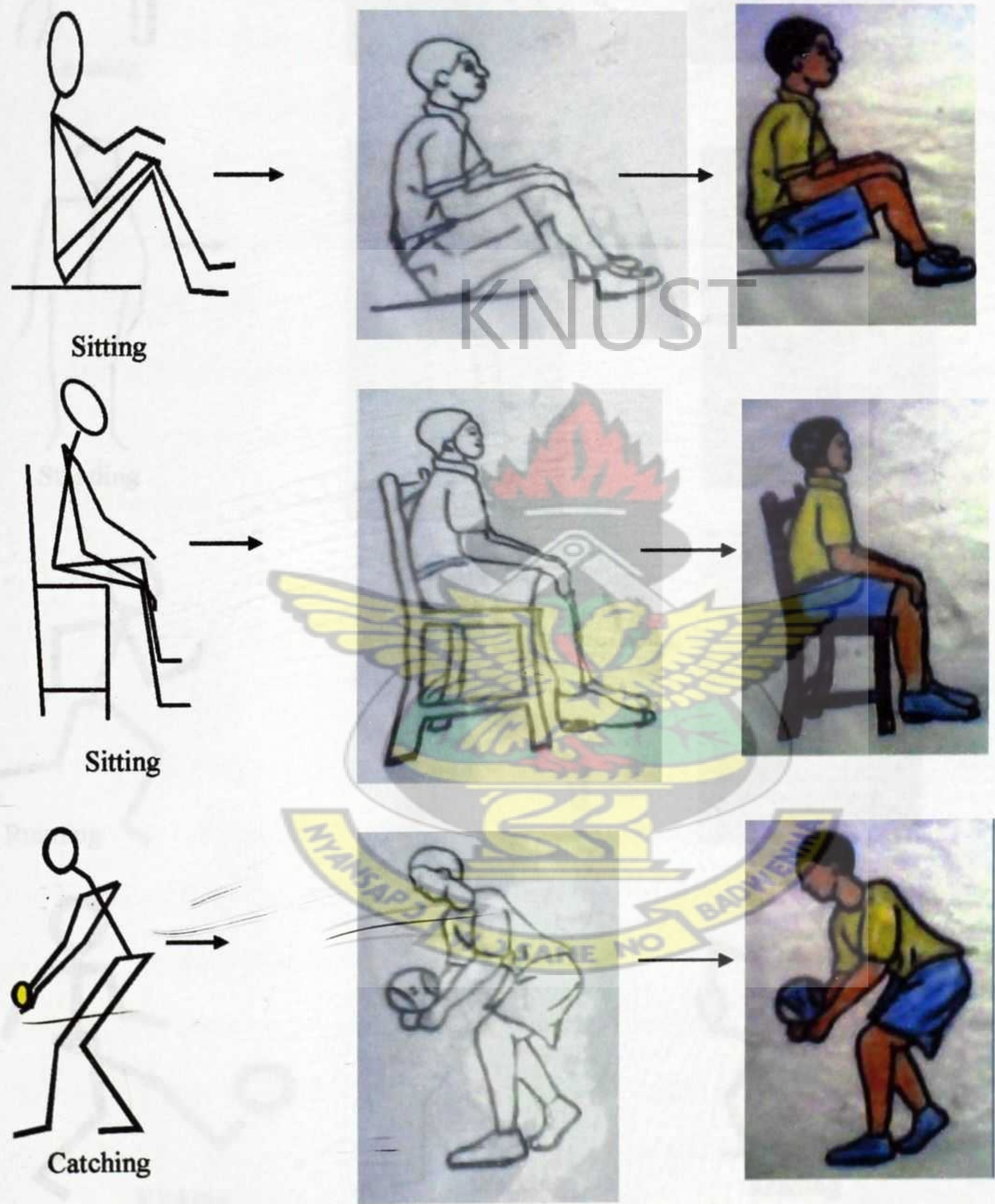
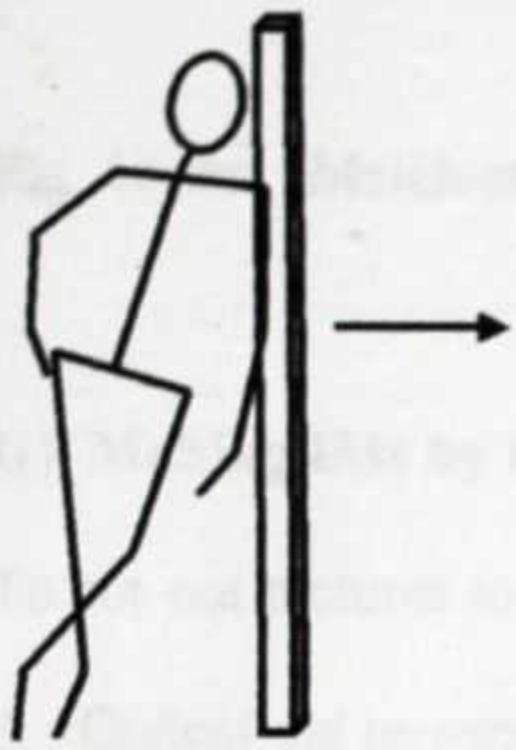
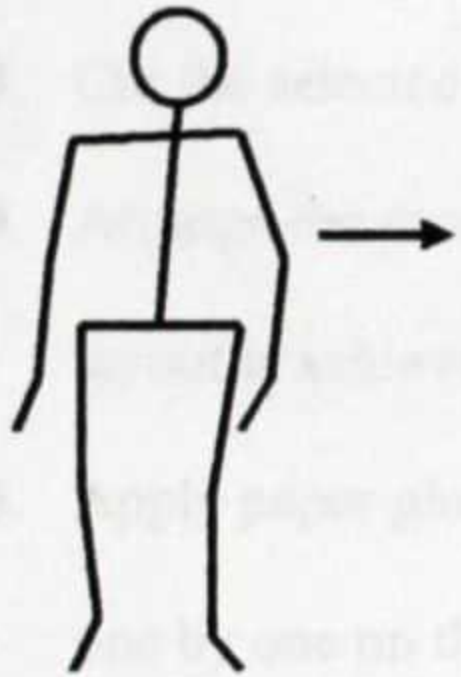


Fig. 10a: Match-stick technique of drawing human figures



Leaning



Standing



Running



Kicking



Walking



Reading

Fig. 10. b: Match-stick technique of drawing human figures in action.

G) Making IMs by the Cut and Paste Method

To cut-out pictures to prepare instructional materials,

1. Collect old newspapers, magazines, tin wrappers, posters and calendars;
2. Select pictures and photos that suit the IMs in question;
3. Cut the selected pictures out using a razor blade, knife or a pair of scissors.
4. Arrange the pictures in various positions on the working surface until the desired layout is achieved.
5. Apply paper glue at the back of the cut-out pictures or images, and gently place them one by one on the surface and rub gently on top of them to fix them.
6. Add text if any, to make it ready for use.

3.9.2 Basic Colour Work

Tools and materials

Piece of cotton wool, pairs of scissors, cutting knives, piece of latex foam, thread, ruler, pencil, eraser, plain papers, newspapers, magazines, calendars, brushes, pencils, markers, felt-tip pens, ink, gentian violet, paper glue, poster colours, colour chalk, colour pencils, palette and coloured objects, a colour chart and colour wheel.

Topic: Colour mixing and application in preparing instructional materials

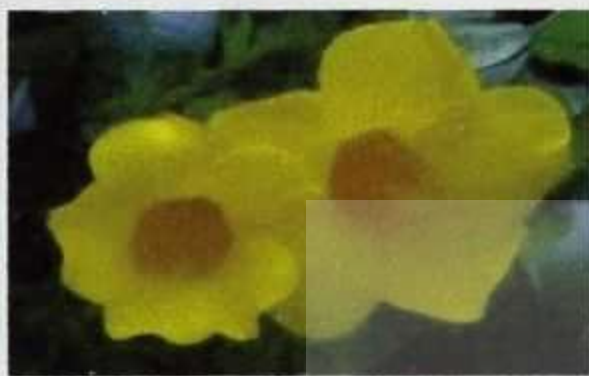
Objectives: By the end of the lesson, the students will be able to:

- i. identify primary and secondary colours in objects seen in the environment and mixing colours to match them.

- ii. identify contrasting colours by matching all the colours to each other.
- iii. draw simple shapes of objects found in the environment and apply the right colours to the shapes.

Activities

- i. Identifying primary and secondary colours of objects in the environment



Yellow (flowers)



Red (tomatoes)

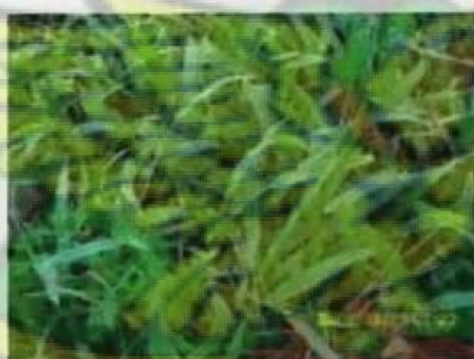


Blue sky

Plate 3: Objects in the environment that bear Primary colour



Orange (fruit)



Green (grass)



Violet (flower)

Plate 4: Objects in the environment that bear Secondary colour

Study the colour chart (Fig. 15) as a guide in mixing primary colours to obtain a secondary colour. Pick (with a brush) a little of the darker primary colour and mix it with a little of the lighter colour until the right hue is obtained. For example, to obtain Orange,

add little drops of the Red colour to the lighter Yellow colour until the Orange colour is obtained.

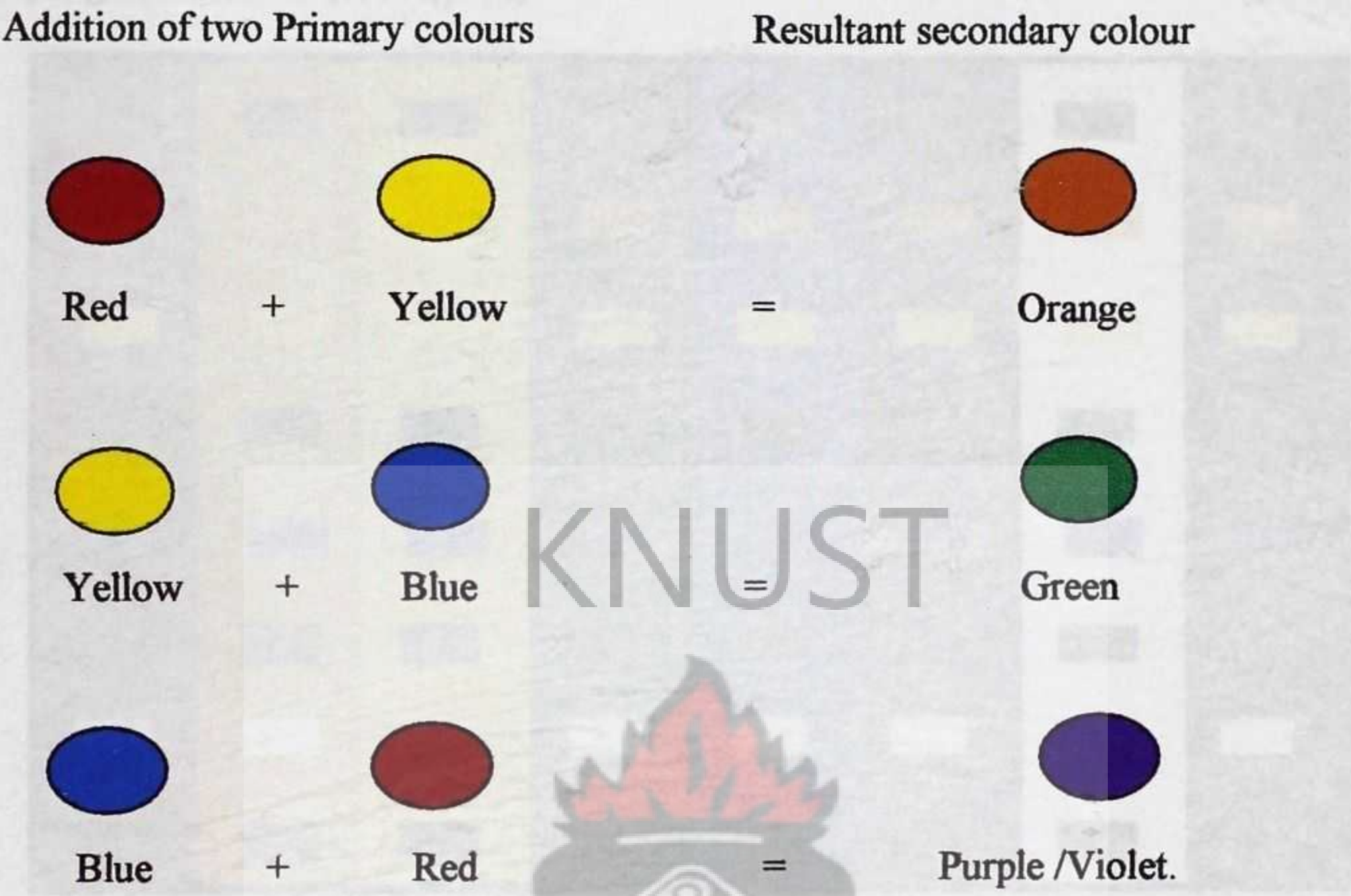


Fig. 11: Colour mixing chart

Identifying Contrasting Colours

- iii. Mix Primary colours in the palette to obtain Secondary colours.
- iv. Measure and cut eight rectangular pieces of cardboard papers measuring 2 inches by 2 inches each.
- v. Paint a different primary colour on each of the three pieces of papers, then paint a different secondary colour on the other three pieces of paper. The other two cards are coloured black and white. This serves as a guide in the choice of colour when preparing IMs.

- vi. Select a colour, for example, red and paint it on the primary, secondary and the neutrals colours. Then the next colour is selected and applied as indicated on the contrasting colour chart (see Fig. 12).



Fig. 12: Contrasting Colour chart

3.10 Data Analysis Plan

The field data from the interviews and questionnaire were put into identified themes and descriptively presented. The researcher largely made use of qualitative data analytical methods to analyse the raw data. Descriptive statistics such as tables were also used to display the analysed data. The findings were supported by relevant pictures, illustrations and tables.

CHAPTER FOUR

PRESENTATION AND DISCUSSION OF FINDINGS

4.1 Overview

This chapter captures the main research findings, discussions and interpretations. It also discusses the results of the practical projects on instructional materials preparations imparted to the teacher trainees at Foso College of Education. This has been done according to the objectives of the study.

4.2 Results of Questionnaire for Teacher-Trainees

Objective One: What are some of the factors hindering the preparation of instructional materials by teacher trainees in Ghana's Colleges of Education?

The data in Table 1 shows that 196 or 98% of the study respondents identified lack of funds while 180 or 90% said lack of seminars on instructional media (IM) preparation are the two major factors that hinder the preparation of instructional materials among the teacher trainees for teaching practice. The data also reveals that the tutors do not teach IMs preparation, and also do not use the College's IM Centre to motivate the teacher trainees to prepare their own IMs or as a resource to teach their lessons.

As Table 1 also shows, the trainees' views varied considerably, with regards to lack of funds, logistical constraints, absence of seminars on IMs preparation as key factors that prevent the trainees from preparing or using IMs on teaching practice. The impression

that only artists can prepare IMs is also one of the most prominent factors cited by trainees.

Table 1: Factors that hinder IMs preparation by trainees in the College

Factors	Strongly agree	%	Agree	%	Disagree	%	Strongly Disagree	%
Lack of funds	148	74	48	24	4	2	0	0
Logistical constraints	72	36	102	51	24	12	2	1
Relevance on Trainees.	72	36	76	38	42	18	16	8
Perception that only artist can prepare IMs	36	18	32	16	104	52	28	14
There is no course in IMs	102	51	22	11	44	22	32	16
Teachers do not teach IMs preparation	62	31	58	29	64	32	16	8
The college does not use the IMs resource centre	72	36	52	26	60	30	16	8
Lack of seminars for students on IMs	118	59	62	31	20	10	0	0

Table 1 also shows that logistical constraints with 174 agreed responses is also a major problem. The good thing is that 66% of the trainees did not think one needs to be an artist to be able to prepare IMs. There also seems to be a shortfall in the college’s curriculum as 62% of the responses showed that there was no course in the curriculum that focuse on instructional media preparation. This suggests that emphasis on IMs is low in the college, perhaps because not all the tutors use IMs to teach and therefore do not impress their

significance on the trainees. This could also be attributed to IMs not being supplied by the Ministry of Education as a result

Responses from tutors interviewed indicate clearly that the various departments in the college lack funds to help trainees purchase materials to prepare IMs. This has led to low practical skills acquisition on the part of the trainees, when it comes to the preparation of IMs. Some of the tutors expressed the need for IMs preparation to be part of the college's curriculum in order to give practical training to the students in IMs preparation.

Evidence from the interviews conducted also revealed that financial constraints and exposure to practical skills of IMs preparation were the major challenges that trainees faced in the preparation of IMs. This was confirmed by the head of Educational Studies department who mentioned that some instructional materials were very expensive to prepare resulting in the inability of trainees to prepare them.

Personal observation of the students on teaching practice confirmed that the trainees lacked the requisite practical skills in the preparation of IMs mainly because before the intervention project, the trainees could not draw some very basic shapes of objects in the environment such as human figures and trees shown in Plate 5.

Agun and Imogie (1988) assert that bureaucracy and bottlenecks in providing the needed financial and technical resources to educational institutions accounts for the lack of basic visual materials for teaching purposes. Dick, Carey, & Carey (2001) support Agun and

Imogie's assertion. They add that creating quality instructional media can be costly, in both time and money.

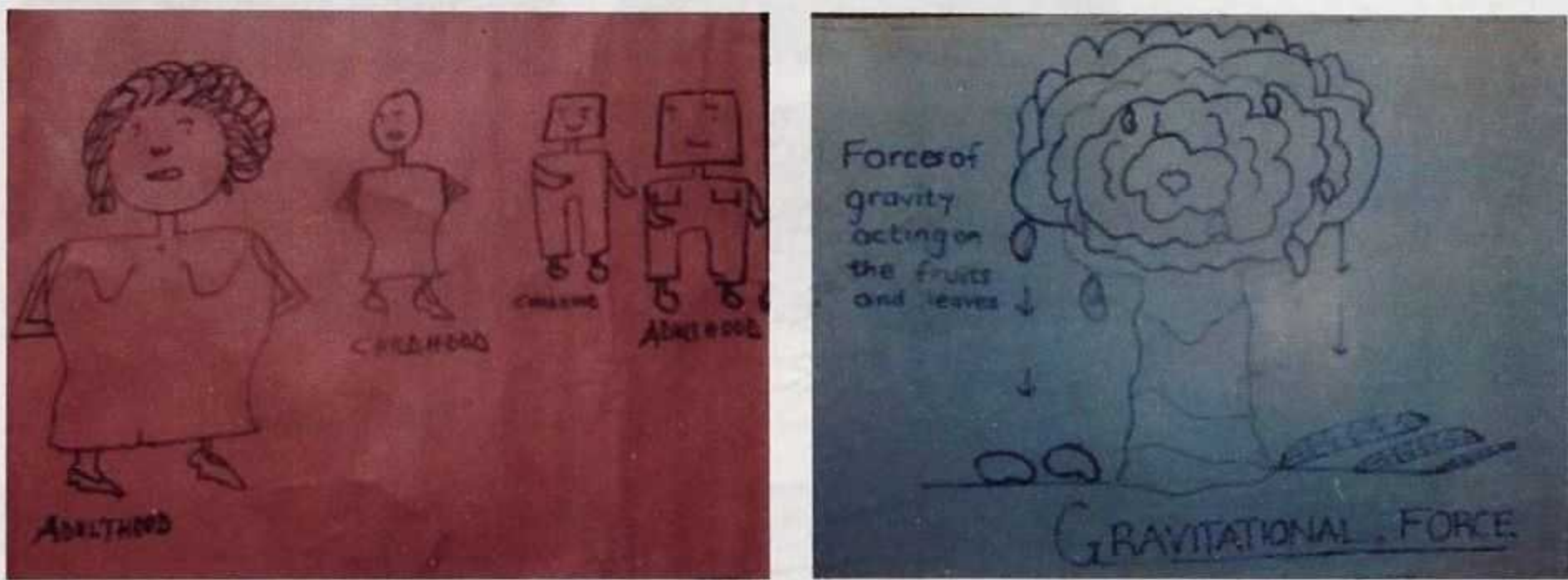


Plate 5: Some pre-intervention IMs prepared by the students.

Even after the intervention, some of the students still found it difficult to translate the various skills acquired in lettering, colour application and drawing into IMs preparation although Plates 6 to 10 show some marked improvement in the IMs the students prepared. It was also realized that the teacher trainees used softcardboard papers to prepare their IMs instead of more durable materials such as plywood, chipboard and metal plates for which they had no funding to purchase.

Intervention IMs prepared by the student

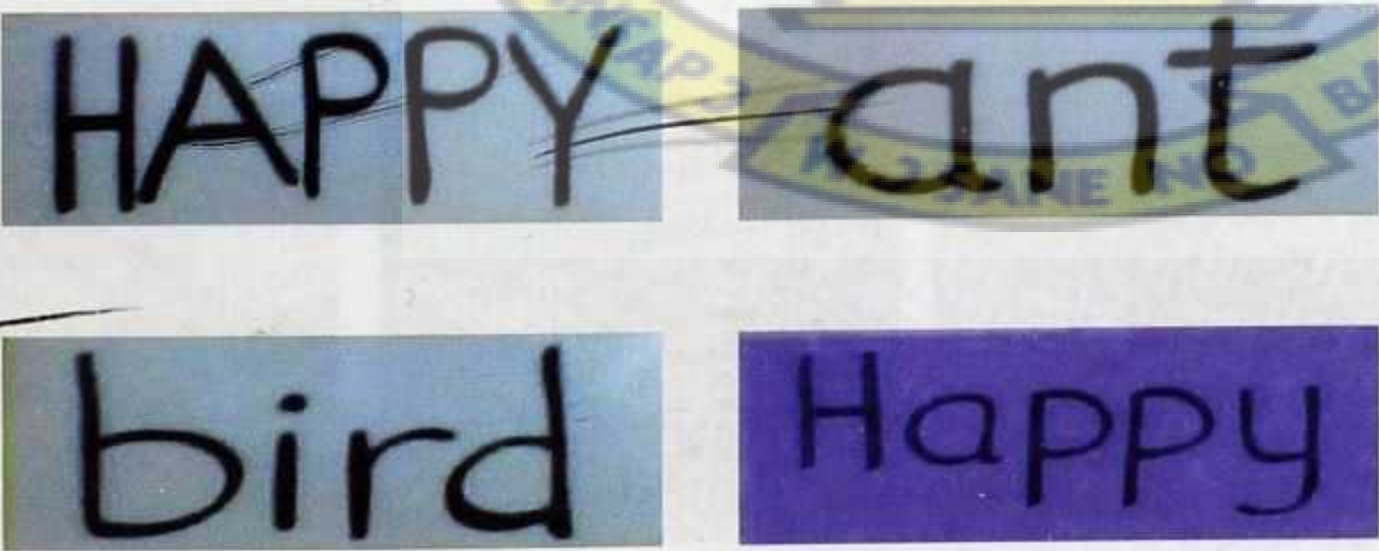


Plate 6: Word cards

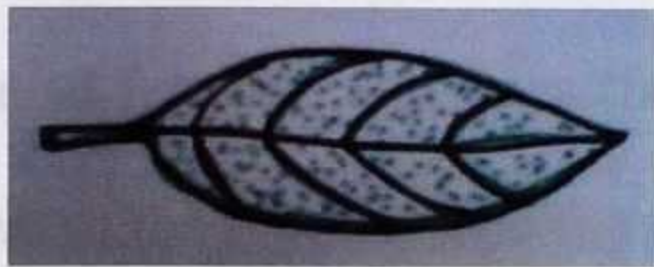


Plate 7: Picture cards.



Plate 8: Picture cards showing flowers.



Plate 9: picture cards on types of fish.

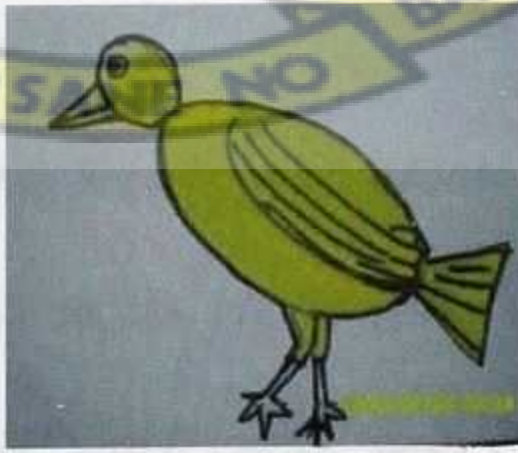


Plate 10: Picture cards on birds.

Plate 11 highlights the lack of practical skills in depicting the actions illustrating the verbs the trainees were required to teach. The figures show poor drawing and lettering skills, resulting in poor presentation of ideas by the trainees. Although the actions suggest the intended learning outcomes the images for wave and jump for example are hardly suggestive of the actions, showing clearly the trainees' limited artistic skills. This goes to confirm Farrant's (2004) assertion that as a result of insufficient practical training, many teachers do not recognize the potentials of simple instructional materials they can make available at very little cost. The poor images also suggest the trainees did not spend enough time to improve the quality of this IM (Plate 11) which also reflect from page 66



Plate 11: A picture recognition chart for teaching verbs

2. Research Question Two: What types of teaching-learning materials require the skill of lettering, drawing and colour application?

With respect to teaching and learning materials that require lettering, drawing and colour application skills, the study found that these skills are needed most in the making of charts, flash cards, visual aids, models, games, word cards, wall charts, pictures, posters, flannel boards, graphics, and maps. The questionnaire responses listed in Table 1 clearly

indicated that the sampled trainees were aware they needed lettering, drawing and coloring of skills to prepare these visual instructional materials.

Table 2: Teaching and learning materials that require lettering, drawing and colour application skills

Factor	Yes	%	No	%
Use of lettering in preparing IMs	160	80	40	20
Difficulty in preparing IMs	172	86	28	14
Opportunity to learn lettering, drawing and colour as helpful	194	97	6	3

As Table 1 indicates, 80% of the trainee respondents pointed to the need for skills training in the identified creative areas to help them in IMs preparation. Besides, 86% of the trainees indicated this would relieve them of the difficulty they encounter in IMs preparation. The 194 responses that indicated that acquiring the skills of lettering, drawing and colour application would provide the respondents opportunity to produce better IMs to help them in teaching their lessons effectively. Only 3% of the responses disagreed with this assertion. The 40% respondents who disagreed that these skills would not be used to prepare IMs probably were thinking of making visual illustrations by themselves but use whatever they could buy for their lessons.

Some of the reasons the trainees cited to support their need to acquire practical skills in IMs preparation were

1. The use of the right IMs in teaching builds teachers' confidence;

2. They make preparation of IMs easier;
3. Prepared IMs are more attractive; and,
4. Properly prepared IMs ensure effective lesson delivery.

Evidence of the need for skills training in lettering, drawing and colouring obtained from interviews with the 10 tutors revealed interesting results: 80% mentioned that IMs made by trainees for teaching practice were not suitable and appropriate for the pupils they teach, because what they often provide are poorly done and show poor lettering and drawing skills. One language tutor mentioned that lettering, drawing and colour work aids language development, if they are used effectively. His recommendation was that proper attention must be paid the making and use these skills in IMs preparation, which confirms the need for intervention to improve teacher and pupils' output in the basic schools where these teacher trainees would eventually go to work. It is critical therefore for the trainees to acquire basic artistic skills such as lettering to encourage the use of illustrations among classroom teachers. This will refute the belief that a teacher has to be an artist to make even chalkboard illustrations when teaching.

The observation also revealed that many non-projected IMs cannot be prepared without acquiring practical skills such as lettering, drawing and colour application. This is evident in the quality of IMs the teacher trainees had previously made and used during teaching practice. Although the charts (Plates 12) contain letters, drawings and colour works, which are essential to teaching children, their use would rather confuse the pupils and not ensure the right learning outcome. This makes it necessary for a study of this nature to be

replicated in other Colleges of Education in Ghana, as an opportunity to help the trainees to acquire effective practical skills in the preparation of IMs. The idea is that during IMs teaching practice where they only teach for marks and under supervision would encourage them to continue the habit to impact positively on their pupils' when they take up positions as teachers. Plates 13-19 show IMs that the sampled trainees produced after being trained.

Poor quality IMs that would not make the right impact could even deter these trainees from making use of IMs when they graduate. This is because as Farrant (2004) indicates lack of artistic skill is a common factor that prevents teachers from making the effort to make illustrations.



Plate 12: Some Pre-intervention IMs used by some third year trainees on teaching practice.

To acquire drawing, lettering and colour application skills. These examples were prepared for various subjects.

Post-Intervention IMs Prepared by the sampled trainees



Plate 13: Picture cards used in teaching picture description.



Plate 14: A picture card showing animals

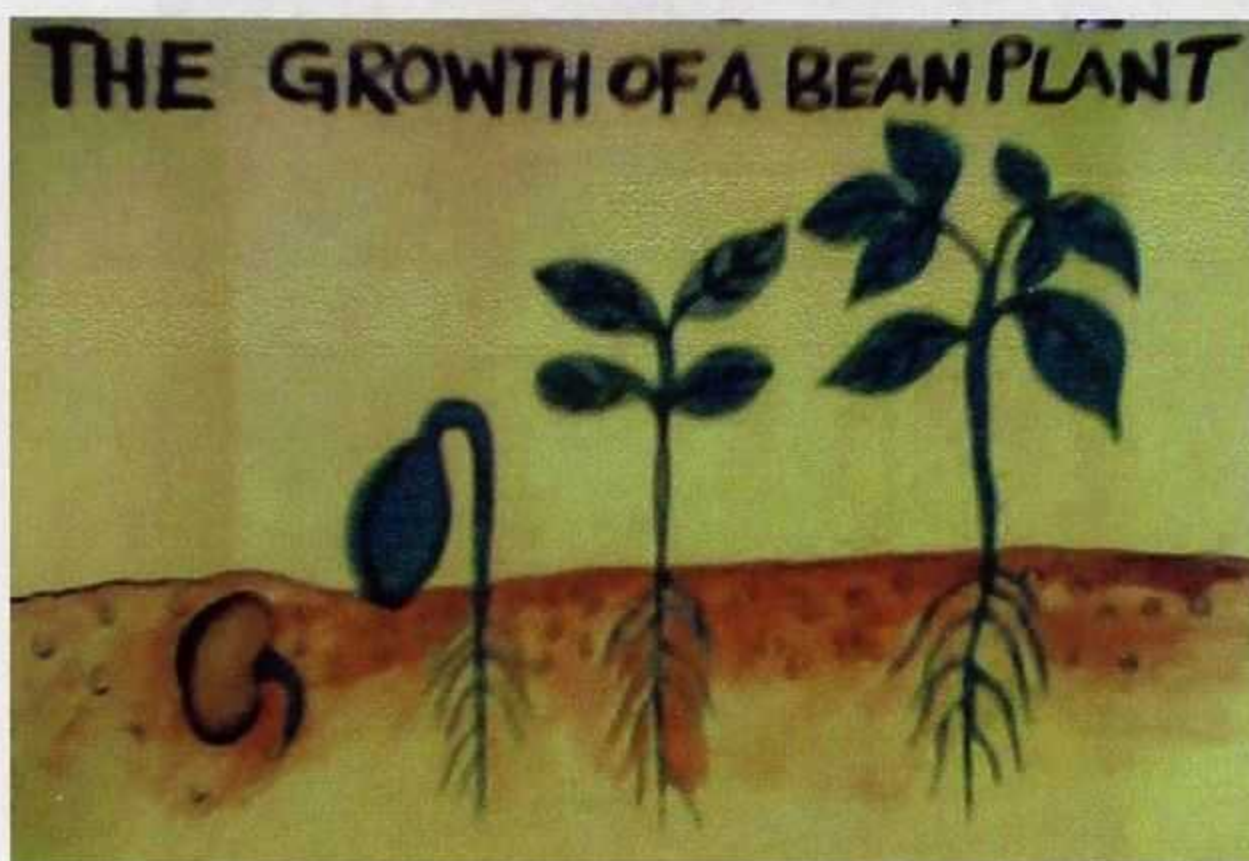


Plate 15: A poster showing the growth of a bean plant.



Plate 16: Picture chart for teaching passage of time in English language



Plate 17: Picture sequence for teaching story telling in English language.

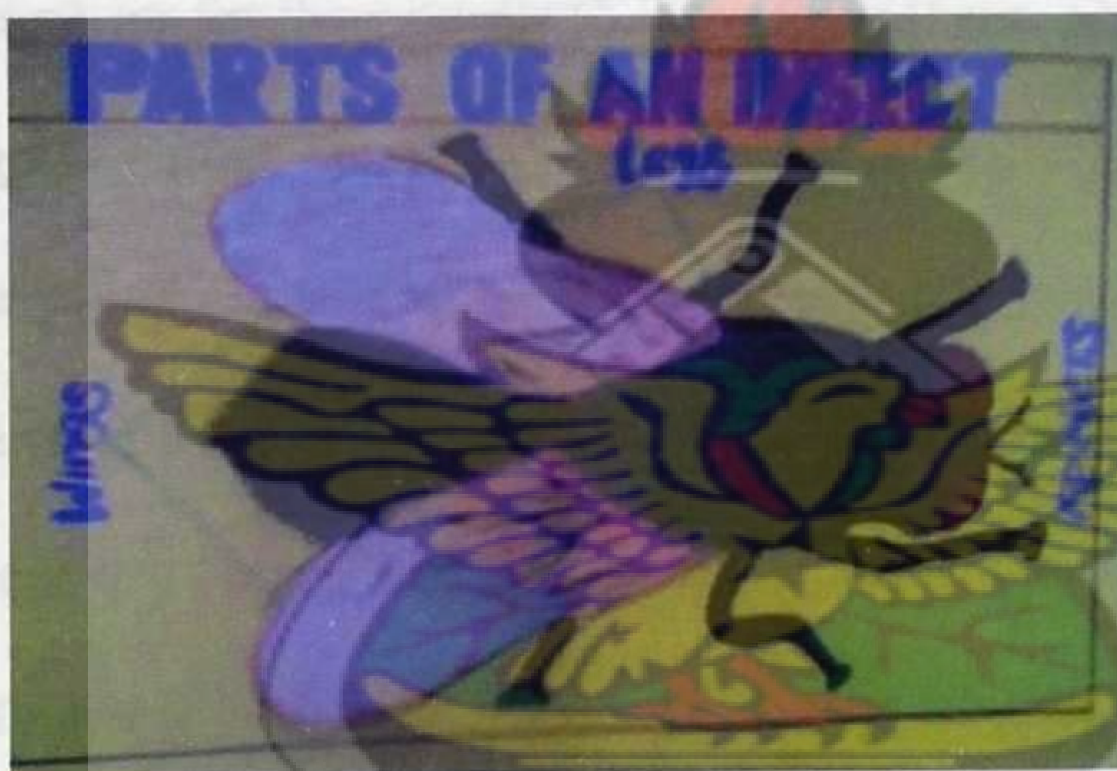


Plate 18: A poster for teaching parts of an insect in Science IMs

Factor	Yes	No	Total	Total %
Colourful posters etc.	100	0	200	100
Good lettering boxes etc.	100	0	200	100



Plate 19: Chart for teaching subtraction in Maths.

On the need for practical skills in lettering, drawing and colour application in the preparation of non-projected visual IMs, 192 of the questionnaire responses confirmed that good lettering, drawing and colour application enhance the quality and add beauty to the IMs, and make it easier for their pupils to learn from them. The responses also upheld the advantages of good colour application and lettering skills in enhancing blackboard illustrations and the preparation of other IMs suitable for teaching young children in primary school. The responses shown in Table 6 shows that these practical creative skills enable teacher trainees to prepare their own visual materials to suit specific needs in the respective subjects they teach to their pupils. This is explained by the fact that nearly all the trainees indicated the relevance of colour and lettering in IMs preparation.

Table 3: The relevance practical artistic skills for preparation of IMs

Factor	Yes	%	No	%	Total	Total %
Colour enhances IMs	192	96	8	4	200	100
Good lettering boosts IMs	186	93	14	7	200	100

The researcher's assessment of the IMs the trainees had prepared for teaching practice on the scale of good, satisfactory and unsatisfactory was based on the observation check list (Appendix C) which took into consideration the quality of lettering, colour usage, drawing and appeal of the IMs. The assessment showed that the IMs the trainees had prepared were suitable for their intended purposes. Although the lapses found did not mar the quality of the IMs, it was realized that:

1. Samples of the pre-intervention IMs made by trainees as seen in Plates 5 and 12 for example, had lettering problems. The human figures in the IMs indicate lack of adequate drawing skills in terms of good proportions. The IMs were also not colourful.
2. During the intervention, the students put in much effort to produce IMs that were of a higher quality as compared to those they produced before the intervention. Plate 6 shows good lettering for a word card, with Plates 8 and 9 exhibiting good drawings made during the intervention. Good colour work was evident in the picture cards the trainees made in Plate 9 and 10. In spite of the good drawing skills exhibited by the trainees in some of the IMs, it was observed that Plate 10 shows a poor illustration of a bird because the wings of the fourth one looks like leaves.
3. The IMs trainees prepared at the post-intervention stage were of a better quality IMs although Plates 11, 16, 17, 18 and 19 had lettering problems. Other IMs that had lettering problems can be seen in Appendix D. The title of Plate 11 has poor inter-letter spacing which make will make reading of the content difficult for the eight year old Basic Two pupils the IMs were intended for. Plate 17 has good

lettering but the style is not suitable for the young pupils who are only beginning to learn English. Plates 18, 19 and 20 have poor lettering in terms of style, size and labeling of the parts of the objects drawn. Lettering appears dull and does not contrast well with the yellow background colour used; reading from them will be a challenge to the pupils, they are intended for, particularly those seated at the back of the classroom.

4. Plates 11, 13, 14, 15, 16, 18, 19 and others in Appendix D portrayed some level of good drawing and colour application. The trainees did well by colouring the objects to portray their true likeness for easy identification. Because the illustrations are good enough to make the IMs self explanatory to pupils who use them, the teacher would not have to talk too much. Though Plate 11 has some good illustrations, the trainee who made it could not draw the human figures to proportion. The Cat in Plate 17 also looks like a leopard.

5. In spite of these flaws, the level of expertise exhibited by the trainees at the Post-intervention stage was an indication that the project has been successful in equipping the selected trainees to develop some level of expertise to enable them help their pupils to gain more knowledge from the lessons taught with the enhanced IMs

4.3 Testing Some Instructional Materials prepared by the teacher trainees

The trainees chose a topic in Science, Mathematics or English language at Basic school two and made a suitable IM to teach that topic. The teaching and learning materials prepared by the teacher trainees were put to test by using them to teach Basic Two classes in two schools: Fosco Demonstration Primary School and Assin Achiase Roman Catholic

(R/C). Plates 11, 14, 15, 19 and 22 are samples of IMs prepared by the selected teacher trainees. The schools were selected as a result of their proximity to the College and so would not involve the trainees making financial sacrifices and could also be close enough to be supervised at short notice. The selection of participating schools also made it easy for the trainees to carry their IMs to and from school easily. The idea was that if they left the IMs behind, the trainees could easily go back and get them for their lessons. It was believed that trainees in the selected schools would make time to test the suitability of the materials they had specifically prepared for teaching practice. A lower Primary class was chosen with the understanding that if pupils at this level were able to identify the drawings and read the accompanying text in the IMs the trainees had prepared, pupils in the upper primary classes will not have much difficulty understanding the concepts portrayed in the IMs. The following sections explain how the trainees used the IMs during the teaching and learning sessions.

1. Testing instructional materials in English Language lesson

The trainee started the lesson by revising the previous lessons with the pupils. At the introduction stage, she asked the pupils to mention some of the activities they performed every day. Some mentioned sweeping, washing, playing, eating and learning among other things. The trainee then explained to the pupils that they were going to learn about action words, also known as verbs. She then asked the pupils to mention some of the action words which she wrote on the chalkboard. In teaching about verbs she pointed to 'dance' on the board and made actions that suggest dancing to explain the word. She then pasted the IM (Plate 20) on the chalkboard to relate the action to the word 'dance'. After this

she called some pupils in succession to point at words and then performs the action that defined those words. At this stage, every pupil wanted to be called to point at a word in the Instructional Material on the board and have the chance to perform an action. The IM that was used was brightly coloured which attracted the attention of the pupils and its use made the lesson practical and interesting. It was carefully illustrated to make identification in them very easy and interesting as well. At the evaluation stage of the lesson the pupils had no problem responding to questions post by the teacher trainee who taught the lesson. Another lesson in which Plate 1 was used had blue lettering as heading. Some of the lettering used was not legible. This made identification of some of the words quite difficult and challenging to the pupils, despite the good illustrations the material carried. After the lesson the class teacher express interest in having teaching material left for her class.

Testing of Picture Recognition Chart

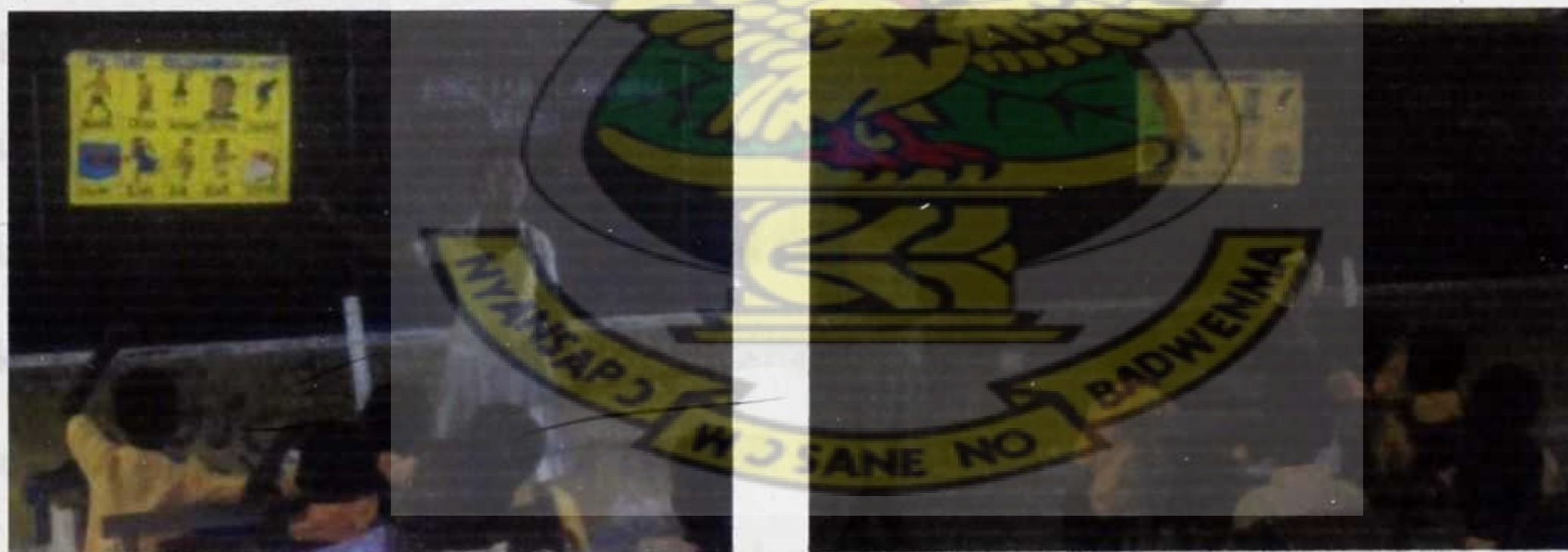


Plate 20a: Trainee explains words on words on chart to the class

Plate20b: A pupil pointing to a word on the chart.



Plate 20c: Trainee pointing at the words on the chart to the class

Plate 20d: A pupil pointing at a word on the chart.

2. Testing of Poster in Science lesson

The trainee introduced the lesson by revising the previous lesson. At the introduction stage, she asked the pupils to mention some vegetables they knew of. A pupil said “onion”. Others mentioned vegetables such as tomato, bean, garden eggs, pepper, cabbage and carrot. She asked the pupils to explain how the bean grows. A pupil explained that it needs to be put in the soil and covered before it can grow. She asked the class “Does the bean grow into a plant in a day?” Some said “Yes” others said “No”. At this stage in the lesson, the trainee pasted the poster (Plate 21) on the chalkboard and asked the pupils to talk about the drawings in the poster. A pupil explained that something was coming out of the bean seed. Others said they could see different sizes of plants. The trainees asked them why the plants were not of the same size and height. A pupil explained that it takes some time for the bean to grow into a full plant that was why they were not of the same size and height. At the evaluation stage of the lesson, pupils had no problem identifying the stages as drawn on the poster. The lesson ended successfully. The poster the trainee used for this lesson was carefully illustrated to make

identification of the images on them very easy and interesting as well. The yellow cardboard made the IM very attractive to the pupils. Pupils were able to identify the images without hindrances because the colour application was carefully done. At the evaluation stage of the lesson pupils lesson, pupils had no identifying the stages as drawn on the poster. The lesson ended successfully.

Testing a poster on growth of a Bean Plant in Science



Plate 21a: Trainee explaining the stages of growth of a bean plant to the class



Plate 21b: A pupil pointing to roots of bean plant in the poster



Plate 21c: Trainee assisting a pupil to point to the germinated bean seed on the poster

3. Testing a Chart in Mathematics lesson

The trainee introduced the lesson by revising the previous lesson. She asked the class to name some uses of the measuring rule. A pupil said “it is used for drawing straight lines”. Some also said it was meant for drawing and measuring. She took a pencil and a stick, and asked the class how they could tell which of the two was longer. One boy said “unless we measure each of them”. Then the teacher trainee displayed an empty Milo tin and an Ideal Milk tin, and asked the class to determine which one was taller. One girl took up the challenge by measuring the two tins and concluded that the Milo tin was taller than the Ideal milk tin. The trainee then pasted the chart Plate 22 on the chalkboard. The pupils were asked to measure the two pieces of sugar cane, labeled C and D on the poster. A pupil who was called to measure the two items concluded that C was longer than D. At the evaluation stage of the lesson, pupils had no problem identifying the images on the chart.

The yellow cardboard made the IM very attractive to the pupils. The IM was carefully illustrated to make identification of the images on them very easy and interesting as well.

Pupils were able to relate to the images on the poster, such as trees, pieces of sugar cane, and the bottles. The lesson ended successfully.

Mathematics IMs made by the Trainees

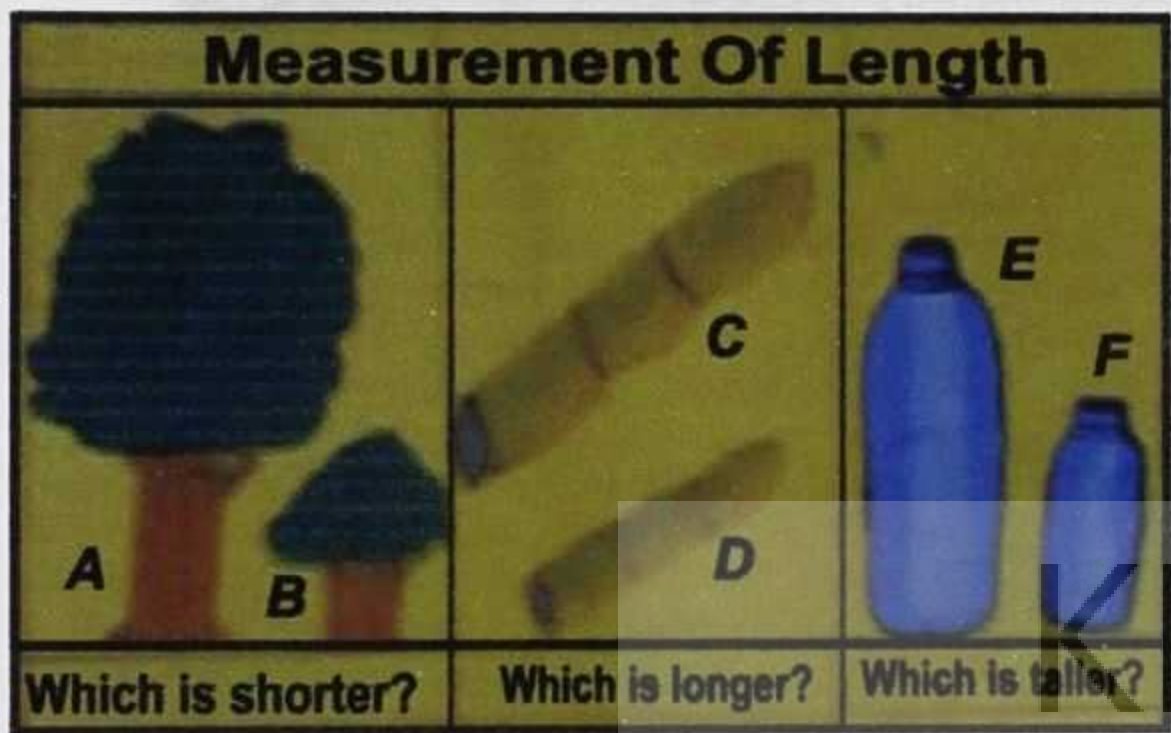


Plate 22a: Chart for teaching measurement of length.

Testing a chart for teaching Measurement



Plate 22b: Trainee leading the class to read the topic on the board.



Plate 22c: Trainee assisting a pupil to measure the images C and D on the chart.



Plate 22d: Trainee assisting a pupil to measure the images C and D on the chart

4. Testing Instructional Material in Mathematics lesson

In Mathematics this lesson taught at Assin Achiase R/C Primary School the teacher trainee taught 'Subtraction' using a chart which indicates subtraction of grouped items. The teacher trainee asked the pupils to give another name for Subtraction and a pupil mentioned 'Minus' which received applause. The trainees developed the lesson by calling five pupils to the front of the class. Then he asked them to go back to their seats. When he asked the class to tell the number of pupils left standing, one girl said "they are three pupils". He then explained that the two pupils who sat down were subtracted from five pupils, who were standing in front of the class, the answer was three pupils. He then pasted the IM on Subtraction (Plate 23) on the chalkboard. After this he asked the class to count the number of items in each section of the chart. He assisted the class to understand the concept that the circled items were to be subtracted from the total number

of items in that section of the chart. He gave an example on the chalkboard using the three blue cars on the IM pasted on the board. One car was circled meaning the three cars minus one gives two and wrote it numerically as $3-1=2$. After the examples, he assigned the class to complete tasks in the other two sections of the chart by counting and subtracting. At the end of the lesson, he removed the chart from the board.

Testing a chart for teaching Subtraction



Plate 23a: Trainee writing an example of the task on the board.



Plate 23b: Trainee explaining the example to the class.



Plate 23c: Trainee writing an exercise on the chalkboard

5. Testing Picture Cards in Science lesson

The trainee introduced the lesson by revising the previous lesson. She asked the class to mention the names of some animals they knew. Names such as monkey, crow, cock, cow and “cat” came up as some responses to the question.

The teacher trainee displayed the chart with pictures of some animals, (Plate 24) on the chalkboard and asked the class to identify each of them. One pupil mentioned a cow, and then another pupil said a cat by pointing at the pictures. After assisting the class to identify the animals, she asked the pupils about the importance of the animals to man. A pupil said “cow gives us meat”. A girl said “we keep a dog as a pet”. At the evaluation stage of the lesson, the pupils were asked to write one importance of any of the animals identified in the poster. The lesson ended successfully.



Plate 24a: Trainee pointing at a picture on the chalkboard.



Plate 24b: Trainee waiting for an answer from the class during the lesson.



Plate 24c: Pupils with raised hands to answer the question.



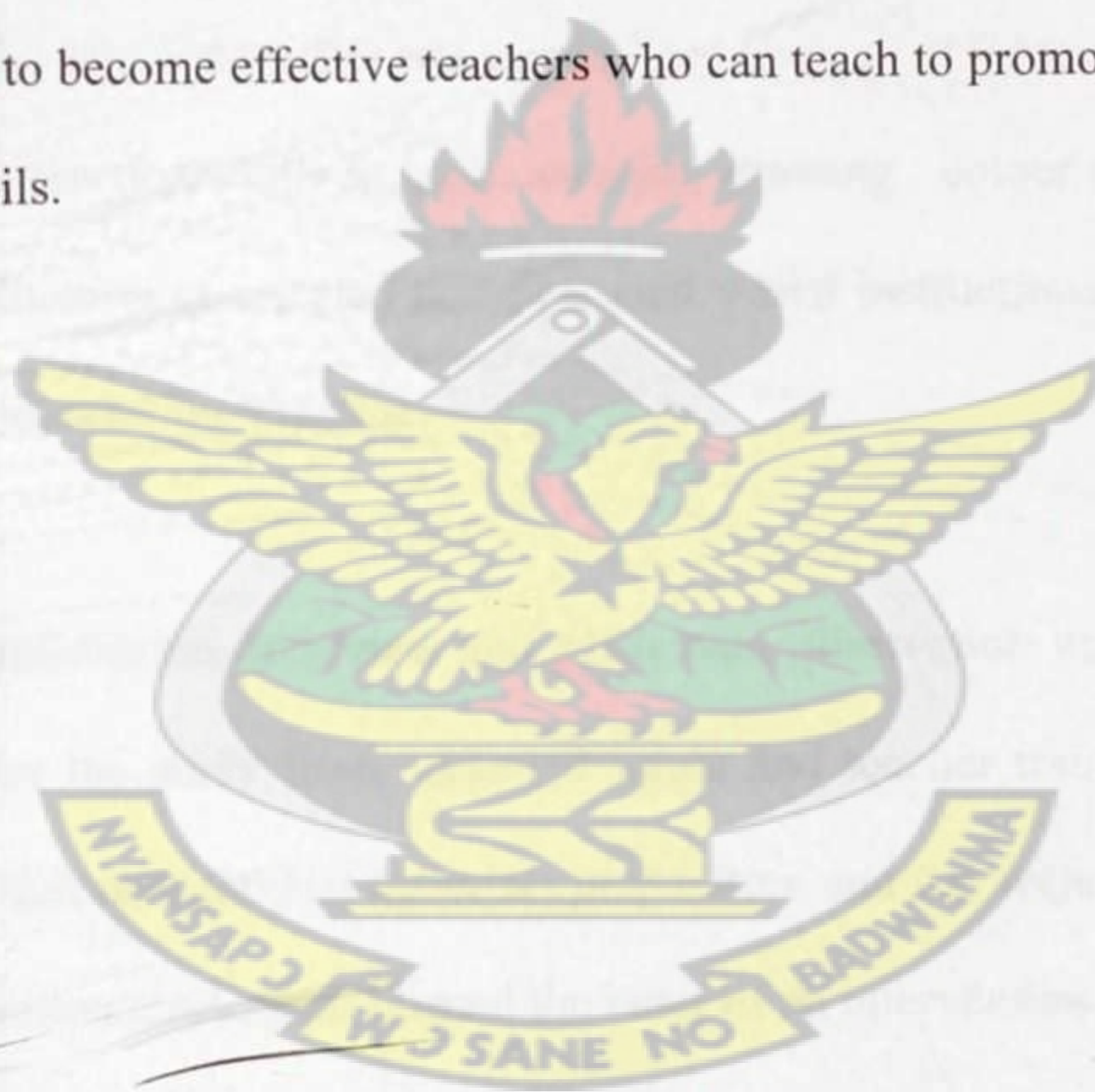
Plate 24d: Trainee uses IM to further explain importance of animals to the class.

4.4 Results and Findings from the Testing of the IMs by the Trainees

- At the IMs and the trainees used during the testing were bright, showing well illustrated pictures with good labelling with the exception of two which had some degree of poor labelling that posed reading problems to the pupils.
- The pupils were able to respond to questions the trainees posed lessons during the because the learners had little or no problem identifying the objects presented in the IMs the trainees used.
- The pupils maintained high attention span throughout the entire teaching and learning process because of the bold nature of the pictures depicted in them.
- The trainees were able to apply the skills they acquired in intention lesson to prepare their own instructional materials for teaching practice.
- The pupils participated fully during the teaching and learning sessions in the schools where the test of trainees prepared IMs took place. The pupils were all eager to be called to the chalkboard to perform an activity.

- The yellow cardboard sheet background of the IMs the trainee used to prepare did not contrast too much with the yellow-green and blue coloured when viewed from the back of the class. This made them rather pleasant for viewing by the pupils.

The results of the teaching and learning sessions with the posters, charts and picture cards that the trainees prepared during the intervention project point to the fact that the development of artistic skills in lettering, drawing and colouring enabled the trainees to prepare the most appropriate IMs then more effectively in teaching lessons that made the intended impact on their pupils. This shows that the project was most appropriate and what the trainees needed to become effective teachers who can teach to promote effective learning among their pupils.



CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Overview

This chapter provides the summary and conclusion of the study and the recommendations for consideration by Colleges of Education in Ghana so that they would equip teacher trainees with artistic skills in the preparation and use of selected non-projected visual instructional materials..

5.2 Summary

The study aimed at teaching selected teacher trainees in Foso College of Education, in the Central Region of Ghana, practical skills in basic lettering, drawing, colour application and their use for the production of selected non-projected visual instructional materials which they could use during teaching practice.

Using questionnaire, administration, interview and participant observation were used to collect the needed data for the study from selected tutors and teacher trainees of the College. The realization that instructional materials preparation and use were not taught as part of the teacher education curriculum formed the basis of an intervention project the researcher designed as a tool to resolve the problem.

The project involved taking selected students of the College through practical lessons to enable them acquire basic skills in lettering, colour work and drawing as a basis for developing appropriate non-projected instructional materials to enhance their teaching of

English language, Science and Mathematics to pupils in Basic Two in the Fosco Demonstration and Assin Achiase RC Primary Schools.. Essentially, the researcher taught the trainees through demonstrations lessons to enable them appreciate the fact that it does not take an artist to make IMs for teaching and thereby empowering them professionally through IMs preparation.

To ascertain the effectiveness of the instructional materials the trainees prepared, selected samples were tested in the two primary schools selected from the Assin Municipality Schools. The researcher personally observed the sampled trainees in order to assess how the use the IMs instructional materials in teaching and learning process in Mathematics, Science and English language, and how effective the sample posters, well charts and picture cards were. It also offered a means to ascertain whether the lettering, colour work and drawing intervention exercises yielded their intended purpose.

The main Findings of the study are:

1. Logistic challenges

Lack of funds, the absence of seminars for teacher trainees on IMs preparation and logistical constraints are the crucial factors that hinder the preparation of instructional materials by trainees of the Fosco Colleges of Education

2. Non-use of IMs in teaching.

Many of the tutors in the College do not teach the practical techniques in IMs preparation, and they do not also use the IMs centre as a resource to help the trainees to learn how to prepare their own IMs for teaching practice.

3. Trainee prepared IMs

IMs prepared by the trainees showed clearly that tuition in lettering, drawing and colour application can greatly enhance IMs prepared by the trainees. The IMs the sampled trainees used, during teaching practice were found suitable for their intended purpose although some of the IMs showed some lapses which did not mar their overall quality and effect.

In particular, the observation revealed the following details:

- The blue paint the trainees used for the letters that formed the text of the IMs appeared dull against the yellow background colour which made reading off the charts difficult for the pupils.
- The post-intervention, IMs the selected trainees produced were of good quality as compared to those they had produced before the intervention. For example, Plate 4.6 had good lettering for a word card and Plates 4.8 and 4.9 showed good drawings. Good colour work was evident in the picture cards the trainees made (Plate 4.9 and 4.10). However Plate 4.10 revealed poor illustration for a bird because the wings of the fourth bird looked like leaves.
- Post-intervention IMs such as Plates 11, 16, 17, 18, 19 IM Appendix D and others had lettering problems. The title of Plate 11 had poor inter-letter spacing which makes reading difficult for the group of eight year old basic Two pupils the IMs were intended for. The lettering style in Plate 17 is not suitable for the age group of pupils. Lettering in Plate 18, 19 and 20 is in terms of style, size and labeling of the parts of the objects drawn. Lettering appears dull and does not contrast well with the yellow background colour,

reading from them will be difficult for pupils, particularly those seated at the back of the classroom.

- Most of the IMs portrayed some level of good colour work especially as used in Plates 11, 13, 14, 15, 16, 18 and 19. Colouring done so well that the objects portray their true likeness for easy identification. This made it easy for the pupils to identify the object presented in the IMs and to also respond to questions posed by the trainees during the lessons. The IMs in (Plates 11, 14, 15, 19 and 22 in particular were bright and showed well illustrated pictures with good labeling. Only Plates 11 and 22 had poor labelling that posed reading problems to pupils.

4. Pupils' participation in lessons

- The quality and attractiveness of the IMs the trainees used in the lessons captured and sustained the pupils' attention throughout the lessons the trainees taught them because of the bold nature of the pictures.
- The pupils participated fully in the lessons taught with the test IMs and they were all eager to be called to the chalkboard to perform an activity.

5.3 Conclusions

It is evident from the research that teachers can teach effectively if they have the practical skills needed to prepare their own IMs at the planning stage of their lessons, which would also enable them to deliver their lessons effectively and successfully so that their pupils would better understand the concepts they seek to explain during the lessons. The literature and this study confirm that the use of the right IMs in teaching

build teachers' confidence and ensures effective lesson delivery (Farrant, 2004). This study also makes it evident that lack of funds and the necessary logistics cripple teacher trainee's ability to prepare appropriate and needed IMs for teaching effective lessons. It is also sad that the IMs center of the Foso college of Education is also not used to teach the practical skills needed in preparation of IMs for teaching purposes. This ultimately leads to lack of skills by the trainees hence they do not get the opportunity to learn and apply the right skills they need to prepare and use IMs.

Although the demonstration teaching method the researcher used to teach the trainees to acquire practical skills in lettering, drawing and colour work was effective in helping the trainees to prepare instructional materials which were appropriate and suitable for the intended class levels in English language, Science and Mathematics the four-month intervention project could not make all the selected trainees proficient in lettering so they would make effective IMs that meet the standard set for them during the study. The implication is that effective use of the IMs Centre could help the teacher trainees to start developing creative skills from the first year so that by the third year they would be proficient in the design, preparation and use of a variety of IMs so that they would carry the habit to their schools when they graduate.

5.4 Recommendations

To impart the needed practical skills in the preparation of IMs to teacher trainees so that they can maximize the benefits of basic instructional materials in the schools to disseminate knowledge, the following recommendations are put forward for consideration and implementation:

1. The National Council for Tertiary Education (NCTE), Ministry of Education (MoE), Teacher Education Division (TED) of Ghana Education Service (GES) should provide funds to support Curriculum delivery in the Colleges of Education in Ghana, to enable them prepare the teacher trainees adequately to acquire the needed expertise in utilizing a variety of local materials for preparing IMs they would use in the schools.
2. The NCTE, MoE, TED and GES should repack and reintroduce the course “Teaching and Learning Materials” which will be taught to teacher trainees in all the Colleges of Education in Ghana. This will help equip trainees with basic skills to produce IMs to improve upon teaching and learning in all the subject areas and the standard of education in all basic schools in Ghana.
3. In-Service training hands-on workshops and seminars should be organized by the NCTE, MoE, TED and GES to orient tutors in the Colleges of Education to acquire practical skills in IMs preparation and use to enable them to impart this knowledge through their courses to all trainees. The researcher will start this by organizing workshops and in-service training for tutors and trainees of the study College to encourage them to make IMs preparation a habit in the professional pursuit.

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APPENDICES

APPENDIX A

Questionnaire

TOPIC: Practical approaches to instructional materials preparation in Foso College of Education

INTRODUCTION: This questionnaire is to solicit views from teacher trainees in Foso College of Education to help teach practical means of preparing IMs in the college. Your assistance will have immense contribution to this exercise. Thank you.

Tick where applicable; select appropriate answer or fill in the space

SECTION A

LEVEL:.....

SCHOOL OF PRACTICE:.....

GENDER: Male [☐] Female [☐]

SECTION B:

1. To what extent do you agree with the following statements on factors hindering the preparation of instructional materials (IMs)?

a. Lack of funds make it difficult for teacher trainees to prepare IM

Strongly Agree [☐] Agree [☐] Undecided [☐] Disagree [☐] Strongly Disagree [☐]

b. Logistical constraints does not allow trainee teachers prepare IMs

Strongly Agree [☐] Agree [☐] Undecided [☐] Disagree [☐] Strongly Disagree [☐]

c. Teacher trainees have the skills to prepare IM and yet feel reluctant to do so.

Strongly Agree [] Agree [] Undecided [] Disagree [] Strongly Disagree []

d. The need to train the trainees in artistic skills in IMs preparation.

Strongly Agree [] Agree [] Undecided [] Disagree [] Strongly Disagree []

e. Availability of a course of study in IMs preparation in the college.

Strongly Agree [] Agree [] Undecided [] Disagree [] Strongly Disagree []

f. Tutors do teach the practical approaches to IMs preparation at the College.

Strongly Agree [] Agree [] Undecided [] Disagree [] Strongly Disagree []

g. Effective utilization of the college resource centre for IMs preparation.

Strongly Agree [] Agree [] Undecided [] Disagree [] Strongly Disagree []

h. Seminars are organized to update students knowledge on IM preparation

Strongly Agree [] Agree [] Undecided [] Disagree [] Strongly Disagree []

Section C

2. Do you usually use lettering in preparing some of your IMs?

Yes [] No []

3. What IMs require the application of lettering skills, drawing and colour?

4. Do you find difficulties when preparing IMs?

Yes [] No []

- Yes [] No []

6. If YES give reason.....

.....

- Strongly agree [] agree [] Undecided [] Disagree [] strongly disagree []

8. Trainees' ability to apply colour in preparing instructional materials can boost their skills in preparing IMs? Yes [☐] No [☐]

9. List some types of instructional materials which can be used in lower basic school class that require lettering, drawing and colour in their preparation

APPENDIX B

Interview Guide for the teaching staff of the College

Name:.....

GENDER: Male [☐] Female [☐]

Department/Subject Taught:.....

Numbers of years as tutor in the college:.....

Time:.....Date:.....

1.Do you use IMs whiles teaching? Yes [☐] No [☐]

2.Do you teach the trainees the use of IMs as part of your instruction?

Yes [☐] No [☐]

3.Do you consider IMs as important component of any instruction?

Yes [☐] No [☐]

4.Which of the following IMs are used in teaching? Posters, charts, models, pictures, flip charts, real objects, videos, audio, others;.....

5.Do you consider lettering, drawing and colour as important ingredients in preparing IMs? Yes [☐] No [☐]

6.What challenges do you face in preparing IMs?

7.Do you accept that trainees lack practical skills when it comes to IMs preparation?

Yes [☒] No [☐]

8.Will you recommend the teaching of practical preparation IMs to trainees in the college? Yes [☐] No [☐] — —

APPENDIX C

Observation check list for the Preparation of IMs

Quality of the IM	Good	Satisfactory	Unsatisfactory
Quality of the lettering			
Legibility of the lettering used			
a. Spellings			
b. Labeling			
c. Boldness			
d. Colour			
Colour usage in the IM			
e. Contrasting colour			
f. Colour combination			
g. Monochrome			
h. Choice of background colours			
Quality of drawings			
Relevance of drawing to the topic			
Suitability of drawing to class level			
Boldness			
General appeal of the IM			
Effective use of IM in teaching			

Appendix D

Science IMs made by the Trainees



Plate 25: A poster for teaching parts of a fish.



Plate 26: Poster for teaching parts of a bird.

Plate 27: Chart for teaching measurement of length.

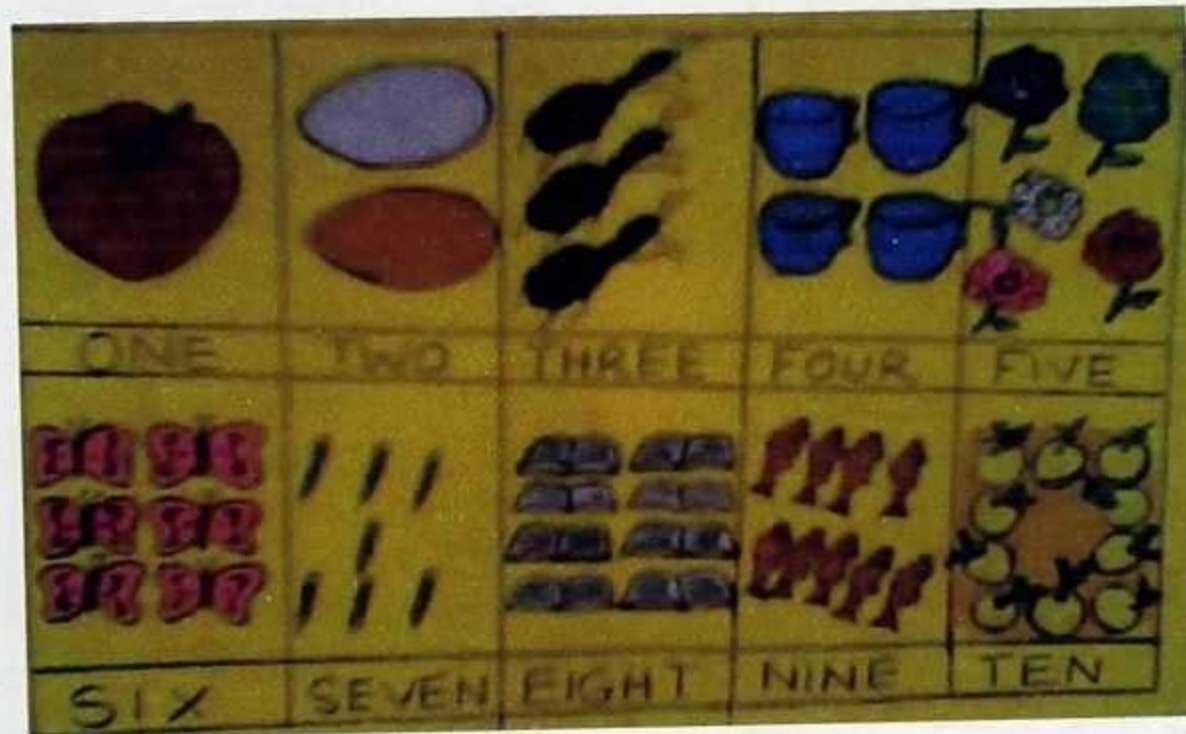


Plate 28: Numerals identification chart.

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