Design and construction of selected instructional materials for Visual Arts in ghanaian Colleges of Education.

By

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CERTIFICATION

I hereby declare that this submission is my own work towards the M.A. and that, to the best of my knowledge, it contains no material previously published by another person nor

material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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ABSTRACT

This research sought to develop teaching – learning materials that have aesthetic qualities and more durable in order to arouse and sustain students' interest in the classroom.

The Principal design used for this research was qualitative design. The researcher employed experimental and descriptive research methods. This was however supplemented by library search, questionnaire and interview. The findings reveal that students in the colleges of education as well as students running the Untrained Diploma in Basic Education (UTDBE) through distance Education organized by teacher Education Division of GES are capable of acquiring skills and knowledge in Visual Art related subjects. However, they need to be introduced to how to organize and produce simple teaching-learning materials to help them teach more effectively when they go to the teaching field. The strongest suggestions were that the GES should vigorously implement the new Educational Reform to its optimum. This will enable pupils to acquire skills and increase creativity which will help the students as well as the nation. The government should reintroduce the teaching of a course titled "Introduction of teaching learning materials" in the colleges of education curriculum.

Finally, the Curriculum Research Development Division (CRDD) of the Ghana Education Service (GES) should come together to collectively organize workshops for teachers on the field on how to prepare simple teaching-learning materials. The District Directorate of the GES in collaboration with the resource centres at the Colleges of Education should organise workshops for teachers at the basic schools on how to prepare simple teaching-learning materials.

(A.K.E)

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CHAPTER ONE

INTRODUCTION

1.0 Overview

Chapter one considers the following topics:

1.1 Background to the study

Instruction is a combination of decisions and activities that are carried out in order to achieve the desired outcomes of learners. Instructional materials include the decision making activities and selection of teaching and learning processes as well as what people refer to as Visual Teaching Aids, or 'Teaching Apparatus'. It also involves all the traditional means of delivering instruction, materials that teachers use to teach and learners or students use to learn. Some of the instructional materials used in the Colleges of Education include visual materials, Audio-Visual Aids and Community Resources.

Despite various successful attempts made by numinous researchers on the production and use of instructional materials, the truth still remains that many teachers and teacher-trainees in Ghana still complain about lack of teaching-learning materials in the Basic schools. Most teachers claim they do not have money to buy common visual art materials, for example manila cards and printed visual materials such as photos, pictures, drawings, charts and diagrams to boost the teaching of Visual Arts related subjects.

A cursory observation has revealed that teachers who rely solely on the oral presentation find that their pupils are unable to relate effectively the new learning to any well-founded basic experience. The need to design, produce and use good instructional materials in the teaching and learning process is therefore a matter of necessity to make the teaching of Visual Arts subjects more interesting and effective.

1.2 Statement of the problem

Teachers and teacher-trainees have abundance of local materials at their disposal which can be used to make teaching and learning more meaningful. The effective use of instructional materials facilitates easy understanding of abstract concepts and promotes effective communication and interaction between the teachers and the students. It also excites the perceptual thinking of students and makes them completely involved in the teaching-learning situation. There are wide ranges of instructional materials from the simplest or low-tech chalkboard to high-tech and more sophisticated ones such as videos, computers and the use of the World Wide Web and the internet.

Many a time, teachers and teacher-trainees do complain about non-availability of appropriate Visual Arts tools and materials at the basic schools and the Ghanaian Colleges of Education.

Recent survey has shown that graduates from Colleges of Education do not have adequate knowledge and skills for the production, and use of instructional materials for Visual Arts Education in our basic schools.

The newly introduced kindergarten syllabus, which places much emphasis on the teaching of creative activities or skills, is dominated by Visual Arts activities. The pupils will continue to learn Visual Arts related activities at the primary school, through Junior High Schools until they get to the Senior High Schools or even beyond.

The introduction of Two Year Diploma in Basic Education through sandwich for Cert 'A' teachers on the field by the Institute of Education, University of Cape Coast, coupled with another course designed by Teacher Education Division (TED) of Ghana Education Service (GES) for the training of 'pupil teachers' dubbed UTDBE which is a four year course, through Distance Education are beset with problems in the field of Art Education. These teachers are those who are going to teach the creative activities in the basic schools and basic design and technology in the Junior High Schools. These categories of teachers lack the basic skills to produce and use instructional materials in Visual Arts effectively.

Some research on the exploration of local materials to teach Fundamentals in Visual Arts related subjects in the new Ghanaian Colleges of Education have been done, but there is virtually no information or manual on the production of visual teaching materials for use by the regular students on the Two Year Diploma in Basic Education (sandwich) and the four year Untrained Teachers Diploma in Basic Education (UTDBE) course organised through Distance Education. There is therefore an urgent need to design and construct instructional materials that can be used to teach Visual Arts related subjects in the Ghanaian colleges of Education in order to enhance teaching skills and knowledge in Art Education.

1.3 Objective(s)

1. To find out the current use of instructional material for visual Art in selected colleges of education.
2. To design and construct selected teaching-learning materials for use in the colleges of Education.
3. To identify and describe the steps involved in the construction of the instructional materials.
4. To test the efficacy of the instructional material in selected colleges.

1.4 Research questions

1. How useful is design in the construction and production of Teaching-Learning materials?
2. Of what importance is design to Visual Arts tutors in creating and teaching Visual Arts
3. What types of teaching-learning materials are appropriate for teaching and learning about colour work?
4. How best can locally available tools and materials be used in teaching to solve teacher-learner problems?
5. How useful are instructional materials in improving classroom teaching and learning situation in Visual Arts related subjects?
6. What is the purpose of preliminary design in the construction and production of teaching-learning materials?

1.5 Delimitations

The study is limited to 13 selected Colleges of Education, seven in the Volta Region, three in Ashanti and one each in Eastern, Western and Greater Accra Regions. The scope of the instructional materials is limited to the design and construction of selected visual materials to teach colour work such as primary colours of light, primary colours of pigment, six point colour wheel, 12 point colour wheel, a chart to teach colour interaction, pictures, (photographs) on natural elements of design, visual illustration on fabrics on artificial elements of design and real objects on elements of design.

The researcher will only identify and describe the steps used in constructing the instructional materials but will not video tape all the steps involved in the production of the instructional materials. The researcher will also not dwell on the methodology of teaching Visual Arts related subjects in the Ghanaian Colleges of Education.

1.6 Limitations

Related literatures on locally made instructional materials are not readily available in KNUST libraries. The researcher had to travel to some colleges and other tertiary institutions to seek for literature which was time-consuming. The researcher conducted the major parts of the research in Volta Region, which is quite far from the KNUST campus in Kumasi, hence the practical project samples were made smaller in size to ease transportation and ensure their safe arrival at KNUST Campus. Due to the nature of the Vocational Skills programme, only one course in Visual Arts is offered in the first semester of the first year in the Colleges of Education so the trial testing for the efficacy of the practical project work delayed. It was carried out using UTDBE second year students and first year students who offer Visual Arts related subjects in only two Colleges of Education. Responses from teacher-trainees on some items in the questionnaire on the use of teaching-

learning materials by their tutors therefore showed some biases for the fear of betraying their tutors or College Authorities.

1.7 Definition of terms/abbreviations

Bako: A soft red wood sawn in the forest of Ghana. It has a harsh smell like pepper

Ban saw machine: An equipment or device mainly used by carpenters to cut and process wood into circular shape. It has a sharp metal blade.

BFA: Bachelor of Fine Arts

Chisel: A tool with a flat metal blade used to cut or create hole in wood.

CRDD: Curriculum Research Development Division.

DBE: Diploma in Basic Education.

GES: Ghana Education Service.

KNUST: Kwame Nkrumah University of Science and Technology.

MOE: Ministry of Education.

Mortise or Mortice: A technical term used for a hole cut into a piece of wood into which you fit the end of another piece of wood called a tenon in order to join the two pieces.

Sand paper: Strong paper with a rough surface that you rub against wood to make it smooth.

Saw: A tool used for cutting wood or metal, consisting of a handle and a metal blade with several sharp teeth along one edge.

Screw: A thin pointed piece of metal used for fastening one thing to another. It has a raised twisted part on it called thread. You push and turn it with a screw driver.

Spoke Shade: An equipment or device used to trim and dress the rough edges of a circular shaped wood.

TED: Teacher Education Division.

TLMs: Teaching-Learning Materials.

UTDBE: Untrained Teachers Diploma in Basic Education**.**

1.8 Importance of the study

This project will encourage teachers and teacher-trainees to prepare their own teaching-learning materials and use them in theVisual Arts teaching learning process.

It will create awareness in teachers at the Basic Schools and teacher-trainees in particular on the need to use the local materials and tools to create forms which will help them duringVisual Arts instruction. When teachers and teacher-trainees alike are able to grasp the techniques and skills of preparing their own teaching-learning materials, it will motivate them to produce their own instructional materials.

The importance of using instructional materials is second to none in terms of quality lesson delivery and achievement of learner desired outcomes. Instructional materials involve the learner physically in the educational experience. It will encourage pupils in the exploration and acquisition of knowledge and skills when they manipulate with tools and materials in the Visual Arts classroom.

The research outcomes will be a resource which will add to the body of knowledge in Art Education. This research report will be very useful to the students of the Ghanaian Colleges of Education as well as all teachers in the basic schools. This research will also attest to the theory that students best understand what is learnt by seeing and practicing the skill themselves rather than a mere listening to a lecture.

1.9 Arrangement of the text

Chapter one basically covers the introduction. Chapter two reviews the related literature, which involves the collection of written materials by other writers that are relevant to the project. Chapter three discusses the methodology and the step-by-step method used to carry out the entire action research. Chapter four comprises the results analysis and discussion of the project. Chapter five summarizes the results of the research, draws conclusions and provides some useful suggestions and recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Overview

The reviewed for the study is based on the following sub-titles:

- Instructional media

- Design
- Construction or production process
- Importance and uses of Instructional materials

2.1 Instructional media

According to Nkuuhe et al (1995) instructional media refers to all aids that are used by the lecturer and student. In order cases it refers to only printed media. For the purpose of this work, instructional media can be referred to as all available devices and the materials used in the teaching and learning process. Nkuuhe et al (1995) believe that every person learns by receiving information through the sense organs such as the ears, eyes, nose, tongue and skin. From personal experience, one may realize that there is a relationship between the quantity of information we remember and the sense organ being used. One will also know that student learn skills, concepts and ideas better when they try them out in practice. Hence the old adage that 'practice makes perfect' has a sound scientifically basis.

Romiszowski (1981:339) defines instructional media in broad terms as including electronic communication media, such devices as slides, photographs, teacher made diagrams, chart, real objects and handouts that are used in the process of planned instructions. Romiszowski outlines some types of instructional media and their samples as follows:

Prints: pamphlets, handouts, study guides and manuals.

Visuals: charts, real objects, photographs and transparencies.

Static/display: chalk board, felt board, display easels, flip charts, cloth board and magnetic boards

The Curriculum Research Development Division (CRDD) and Teacher Education Division (TED) of GES (2004) enumerated and grouped instructional media to be used in the Colleges of Education in teaching vocational skills under the following types; Visual Materials, Audio-Aids, Audio-Visual Aids and Community Resources.

Visual Materials:

(a) 3-dimensional objects, models, specimen

(b) Prints: Textbooks, workbooks, programmed materials, handouts

(c) Chalkboards

(d) Flannel or felt boards

(e) Bulletin boards

(f) Still pictures

- Non-projected photographs, illustrations
- Projected slides, Film strips, overhead projectors, opaque projectors

(g) Graphics: charts, graphs maps and globes, posters and diagrams.

Audio-Aids:

(a) Radio

(b) Record player

(c) Tape recorders

Audio-Visual Aids:

(a) Motion pictures

(b) Television

(c) Audio conferencing

(d) Computer Conferencing

(e) Video

Community Resources:

(a) Community Experts

(b) Libraries

(c) Museums and Monuments

(d) Chiefs' palace

(e) Exhibitions

(f) Festivals

(g) Cultural shows

(h) Durbars

(i) Drama groups

(j) Asafo companies

(k) Customary rites

(l) Parent Teacher Associations PTA

(m) Churches

Dale (1957) defined Visual teaching materials as “materials that do not depend primarily upon reading to convey their meaning. It is based upon the principle that all teaching can be greatly improved by such materials because they can help make learning experience memorable”. Inferring from Dale’s definition, it confirms that when Visual materials are used wisely in teaching-learning process, they promote effective teaching and learning. Dale’s statement neither suggests that visual materials should be introduced into every teaching situation nor teachers should scrap all teaching methods that do not involve the use of variety of visual materials. It could be argued, that when well designed teaching-learning material is used appropriately in a lesson presentation, a desirable outcome will be achieved and teachers problems minimized.

Fianu (1999) postulates that Teaching-Learning materials are either visual or audio-visual. According to him, visual aids or materials are those which teachers use to make visual impressions on the learner during the lesson for effective understanding of a lesson. Fianu describes audio-visual aids or materials as anything seen and heard which together with the teacher’s voice add to the effectiveness of instruction or teaching. Much as the writer agrees with Fianu’s assertion of teaching learning materials being either visual aid or audio-visual aid, the over-use of the word “aid” is gradually becoming a thing of the past. Many people prefer instructional media or materials to visual and audio-visual aids in recent times. Perhaps, this is as a result of globalization and the fast growing era of computer age.

2.2 Design

The purpose of this sub-section is to briefly discuss the concept of design, in relation to production of artefacts, tools and equipment and their functions. Such a discussion would help put the problem under investigation in its proper context.

According to encyclopedia Britannica (1984:298) "design is from the Latin word "designara" which means to "mark out". It is the process of developing plans and schemes of action whether in mind or set forth as a drawing model."

Herold and Pomeroy (1992:17) opine that design as a visual thinking of a higher order than verbal thinking. The word design has many depths of meaning and that only philosophical method will strip off all the meaning to provide a coherent and comprehensive view.

According to Lowenfeld and Lambert (1964) Art for children in the schematic age is chiefly a means of self expression: "He is not aware of the beauty in what he does or does he spontaneously decorate an object". However, adults can see many design qualities in what a child of this age paints or draws. They further stated that, the teaching of "fundamentals of design" will be an artificial adult imposition and could destroy the spontaneous creativity. The researcher agrees with this assertion basically due to the fact that a child at schematic stage might not achieve mastery in planning any meaningful work in Visual Arts.

Lowenfeld and Lambert quoted D'Aminco, (1953) as saying: one factor responsible for weakening the child's native sense of design is the nature of teaching design, the imposing fixed formulas on the child now in general practice. However one of the important attributes

of design is rhythm and this rhythm is often to be seen in children's painting in their repetition of form. The researcher agrees with the assertion that even though children's work may be considered as design by adults, they are only excising the natural innate ability of their development.

Whatever the outcome of their work will be, the child does not consider it as design but only take satisfying experience and expression.

Lowenfeld and Lambert (1970) opine that one main function of design can be the establishment of harmonious relationships. This is typical among the children in their gang age thus children ageing between nine and twelve years. It is important that children within these age groups will be stimulated in thinking and be provided with opportunities for discoveries relating to natural beauty of material found within their local environment.

Nkuuhe et al (1995) suggest that before one can produce any instructional materials including printed media, one should plan carefully. Take into consideration the objectives one intend to achieve, the target audience, whether prints are the most appropriate media. They state further whether printed media will be used alone or in combination with other media. Planning in the production of printed media will have to be more elaborate than that of display media such as the chalkboard, posters and transparencies. There are three stages in this planning: pre-design, design and post-design.

Kemp and Dayton (1985) propose that one has to make a checklist for this preliminary planning before instructional material is produced. Similarly, the researcher agrees that preliminary sketches should be made when designing any instructional media or teaching-

learning materials. These designs will help the artist to choose the best design that will serve as a guide to complete the finish artifacts.

According to Amenuke (1995), design refers to planning, that is, organization of elements of art into visual forms. Inferring from the above definition, design can also be described as a plan of work of art or simply, a plan. This plan will guide the artist in executing the final work.

According to Appiah (1992:93) the making of patterns or detail planning and arrangement of lines and shapes for the creation of ornaments, or the creation of shapes is design. The writer agrees with this assertion, however designing goes beyond just creating of lines and shapes to other intricate and complex designs, some of which are helpful in the field of engineering and architecture. Appiah confirms that when a designer plans a work, he puts together certain qualities known as element of design and principles of organization. Dots, lines, shape form, texture, colour, space, plane, volume and mass or weight are the elements of design, which a designer employs to enhance what he designs. However, the structure of any design, whether two or three dimensional is based on the planning and arrangement of these elements of design according to certain principles. These can be described as principles of organization. The effective use of these principles namely variety, unity, harmony, rhythm, balance, dominance, opposition, repetition, contrast and proportion and scale in design and their presence, create an aesthetic response in a finished product.

Wise (1990:4) testifies that design is about problem solving. Wise's statement does not only hold facts but throws more light on the fact that human existence as individuals depend on inventions. Our ability to design and produce tools, equipment and materials will aid and improve teaching-learning situation in Ghanaian schools. Without designs, there will be no invention. Therefore design plays an important role in all inventions. The most convenient use of the term invention is to consider it as an important or original step in design.

The World Book Encyclopaedia (1995:15) describes design as organized arrangement of materials to satisfy a functional purpose. Design therefore plays an important role in the creation of fine art and industrial products.

2.3 Construction or production process

The purpose of this section is to closely look at the processes involved in design and construction or production of teaching-learning materials. Such a discussion would help us to determine the nature of tools and materials that will be more applicable and how these materials could be used.

The process of design and construction is very complex as it consists of a number of stages, which are influenced by a variety of aesthetics, technical and creativity. In order to achieve optimum results in designing, it is important to be familiar with the design process from the beginning, which is the preparatory sketches or working drawings through production stage.

According to Chambers 21st century Dictionary (1996:1104), production is the act of producing something or series of activities carried out in an orderly manner as part of a manufacturing process. It could be a literal or artistic work.

Lockyer (1974) believes that design is a process. He added that, in every project, the programme will pass through the following stages: conception stage, acceptance stage, execution stage and pre-production stage.

(a) Conception, when a draft specification is laid down.

(b) Acceptance, where the specification is shown to be achieved by mathematical calculation, preliminary drawing, bread-board or mock-up models or laboratory-scale processes.

(c) Execution, where a number of models are prepared from the work above, or pilot-plants are made up following the laboratory-scale experiments.

(d) Translation, where the project is put into such a form that it can be manufactured within the organization where it will be produced and to the specification lay down.

(e) Pre-production, where quantities are produced sufficient to check the design and specification. It is not till this stage that drawing can be 'frozen'. That is considered being final and liable to change without authorization.

Smith (1978:12) opines that without design, production cannot be achieved. It therefore implies that in constructing or producing an artefact, designing plays a very vital role to aid the artist complete the work. Yeboah (1998:17-21) also believes that in production, defects in design cannot

be altered or put right during production. It could be ascertained from Smith's and Yeboah's assertion that, design plays an important role in production. However in recognition of Yeboah's assertion, one could argue that this is not always the case. For instance, if there is defect in design (shape, texture and colour) of an article, the manufacturer could correct the defect during the finishing stages of production. If colour is defect, it is the matter of changing the colour. However, in mass production if there is a defect on design of an article it would be financially costly and time consuming in putting design right during production. Therefore, it is very important that design should be well made and approved before production starts as proposed by James.

James (1987:12) is of the view that design and production job must begin with a meeting of key people. The project is discussed, and the designer is chosen to make visual presentation or a design. A design concept is approved and a drawing is prepared for production.

Kinard (1988:114) state that production should be planned and controlled. He asserts that, production control focuses on meeting production plans efficiently. In production, planning is primarily concerned with determining what products or articles will be produced, how they will be produced, when they will be produced and where they will be produced.

Amenuke et al (1995) enumerates the following stages as design and technology process:

- Stage 1: The problem
- Stage 2: Define and specify the problem
- Stage 3: Investigate the problem (Research and Analysis)

- Stage 4: Suggest possible solution
- Stage 5: Sketch model (if necessary)
- Stage 6: Prototype
- Stage 7: Working drawings
- Stage 8: Production (making the Article)
- Stage 9: Appraisal

Amenuke confirms that design process deals with identification of a problem or a need for what you want to produce. This definition involves specification of what must be done. This will lead to investigation of the problem or some research analysis on the problem at hand. This analysis may include the function, size, shape, tools and materials needed for the work among others, while considering the technology, cultural elements and aesthetic qualities.

Stage four deals with deriving ideas from the environment, making sketches from free-hand drawing and redesigning until a suitable one is derived. Selection of appropriate materials is also required. Stage five takes care of sketch-model from the shapes design using suitable materials. Prototype is making and article in a suitable material that can function like the final article. Working drawings; draw the prototype article to technical scale. Stage eight which is making the article; go with using the appropriate tools, materials and techniques, to produce the final article.

In stage nine, which is appraisal, trail-testing is done to see the efficacy of the article. This will help to detect any defects and make modification.

2.4 Importance of Instructional materials

The purpose of this sub-section is to outline the importance and uses of Instructional materials. Any insights provided by the search will help to determine how to effectively use the Instructional materials.

The new structure and content of Education M.O.E (1974) states that, teaching as an activity can be enhanced or done effectively when there is the use of teaching-learning materials such as wall charts, chalkboard illustrations, diagrams, photographs or pictures. The use of teaching and learning materials is very important at all levels of pre-university education.

This justifies the idea that they make teaching-learning process easier and clearer. These materials should capture students' attention and help recall of learners objectives. It should also elicit students' response and provide feedback. Lisa (1985:86) states that Instructional media help add elements of reality. Lisa cited examples, including pictures or highly involved computer simulations in a lecture. However, the writer agrees with Lisa that pictures are means by which teachers and students interact. Pictures effect communication and help to gain or maintain attention. Pictures do not only provide information but are facilitators of information for better understanding of abstract concepts.

The importance of using Instructional or Teaching-Learning materials is second to none in the teaching and learning process. Instructional media involve the learners physically in the learning

process. Learners observed an experience with little or no comments during the activity. Learners enter into their experience by using their senses .Examples are described as follows:

Printed media: It provide common type of material which provides variety of application which promotes easy production of quality materials and desk top publishing in a simple manner which is quick to prepare and enhances students retention or knowledge.

Flip charts/posters: They are easy and inexpensive to make and update. They are also portable and transportable.

Real objects evoke and produce clear-cut concept for easy understanding. They are quite easy to obtain with a little foresight and help from student one can easily lay hands on real objects. Museum and private individual have collections of items of historic interest that they will provide for display.

Models: Many real objects are readily available to be brought into the class. However, it is still very useful to give three-dimensional stability to pupils' concept. The use of carefully constructed models will assist the teacher to create good learning situation.

Advantages of Using Instructional Media

Instructional media have important advantages because they allow easy and repeated reproduction of an event or procedure, provide Visual access to a process or technique, provide a common framework or experience to a large number of learners, promote the illusion of reality, gain and hold the attention of the learner, focus attention or highlight key points, save time by avoiding wordy explanation and it also facilitate the understanding of abstract concepts.

Romiszowski (1988) outlined some reasons for media use with examples of appropriate media.

The table below indicates some General Examples of media and reasons for their use.

Table 2-1: General examples for media and reason for their use

General Example	**Reasons for media use**
Real objects, model, picture, photo	To form a clear idea of something which may be inaccessible
Diagrams	To clarify abstract information which may be difficult to communicate verbally. It also condenses large quantities of information.
Pictures	Promote mental activities of students.

The writer will adopt and use visual illustration including diagrams, pictures, photos and real objects in making his practical works. The writer also agrees that instructional media can be used to demonstrate certain phenomenon. However in selecting instructional media, one of the challenges that confront you is the ability to choose the best and the most appropriate instructional material which will stimulate and incite students' learning.

Any material selected should be easy to be used.

Horowitz (1992) postulates that Art can function in diverse ways. It serves as a record of events, objects and situation. It serves as a substitute for a real thing; a stand in, or symbol. It communicates ideas or events. It educates and also serves as a means of self-expression. It helps to release emotion and it is a means of exploration of vision. This testifies that when exciting and well designed teaching-learning materials or artefacts are produced and used, students in Colleges of Education as well as the pupils at the basic level of Education will benefit greatly to improve human experience and better learning outcomes.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Overview

This chapter focuses on the following: research design, library search, and population for the study, sampling design, primary and secondary source of data, data collecting instrument validation of data collecting instrument, administration of data collecting instrument, data analysis plan and the step-by-step method used to carry out the entire study.The purpose of this study was to design and produce teaching-learning materials in teaching vocational skills at Teacher Colleges of education.

3.1 Research design

The principal design used for this research was Qualitative research. The researcher also employed Experimental and Descriptive research methods.

3.1.1 Qualitative Research

Qualitative research is a field of enquiry that cuts across disciplines and subject matter. It involves an in-depth understanding of human behaviour and the reason governing human behaviour. Qualitative research relies on reasons behind various aspects of behaviour (Best 1981: 62). Best further states that qualitative research seeks to investigate the why and how of decision making. Qualitative researchers typically rely on four methods of gathering information, namely; participation in the setting, direct observation, in-depth interview and analysis of documents and materials. Researchers employ qualitative research to explore and understand people's experiences, attitudes, behaviours and interactions.

3.1.2 Experimental research

Experimental research is an orderly and rational method of manipulating one or more independent variable(s) in a controlled setting, in other to determine their effect on the dependent variable(s). To achieve this, certain treatments or environmental conditions are manipulated. Observation is then made to find out the effect(s) or changes on the given subjects. Laboratories make heavy use of this method. However, there are other classroom situations in which this method has proved useful. Experimental research according to Best (1981) provides a systematic and logical way of answering the question if this is done under a carefully controlled condition, what will happen.

The concept of experimental research could be further explained by the following characteristics: experimenters deliberately manipulate certain stimuli/treatment of environmental conditions and observe how the condition or the behaviour of the object is affected or change. However the researcher must be aware of other factors that could influence the outcome and remove or control them. Experimentation could be effectively applied within non-laboratory conditions such as class room. In the classroom, variables can be controlled to some extent. After experimentation, there is

the need to describe the processes, analyse the results, interpret them and document what has been done by writing a report.

3.1.3 Descriptive research

Descriptive research deals with information regarding the present condition of events existing at a particular time of a study. In descriptive studies, efforts are directed at finding out an existing situation and connecting it to the variable or condition prevailing in the situation. Usually, a descriptive study measures a single variable “the simplest descriptive studies measure a single variable; they may involve no more than reporting the frequency of some event” (Ary et al, 1990:381).

Descriptive methods involve recording, analysing and interpretation of existing conditions. It makes no attempt to manipulate variables but compare and contrast and attempt discover relationships between non-manipulated variables. Its concern is to either to describe and interpret existing relationship, attitudes, practices, processes and trends or compare variables. The method was employed in this study to explain and describe the various steps involved in the design and construction of the teaching-learning material.

3.2 Library research

Library search was used because the researcher needed to deepen his theoretical knowledge on the nature and process involved in design and construction. Libraries visited to source information

on what other authorities had written on this study include Kwame Nkrumah University of Science and Technology (KNUST main library), College of Arts and Social Sciences (CASS) library –KNUST, College of Art Education Library – KNUST, University of Education Libraries – Winneba and Kumasi Campuses and Department of Art Education library UEW-Winneba. The researcher made use of books, Journals, charts and brochures that are relevant to the study. The researcher also made profound use of the internet. Website on education instructional material in art that had direct bearing on the study was utilized.

3.3 Population for the study

The population is heterogeneous. The target population was first year students who offer vocational skills Fundamentals in Visual Arts related subjects in13 Colleges of Education. Seven Colleges of Education in Volta Region, three in Ashanti and one each in Eastern, Western and Greater Accra Regions. Second year students offering vocational skills, Visual Arts related subjects as elective and Visual Arts tutors in the vocational skills department from the named Colleges of Education and resource person from CRDD was also interviewed. The accessible population comprised 260 first year students who offer Visual Arts related subjects during the first semester, 130 second year students who offer Visual Arts as an elective subject and 20 Visual Arts tutors teaching vocational skills.

The stratified random sampling technique was used to select students for the study. Each year group formed a stratum but more first year students were used because fewer students offer Visual Arts in the second year as elective subjects

3.4 Data collecting instruments

The researcher made use of questionnaire and interview as research tools for collecting data. The researcher used these tools to find out the current use of instructional or teaching learning-materials in the colleges of education.

3.5 Primary data:

The primary data is made up of information collected from research instruments, thus, responses from questionnaires and interview.

3.5.1 Questionnaire

Questionnaire is a data collecting instrument used to gather factual information. In questionnaire a set of questions are well designed and usually printed on paper. The questions could be open-ended form or closed-ended form which are administered or distributed out to prospective respondents. Mainly an open-ended question is the one that requires people to give a comment or an opinion rather than a “Yes” or “No” answer. Whiles close-ended form limits an answer to “Yes” or “No” or giving options to choose an appropriate answer. In other to solicit effective response from the students and tutors, the researcher made use of both forms of questionnaire. The researcher made use of face-to-face contacts with respondents so that clarification is given to respondents on items that are not clear or easy to understand.

The researcher distributed 20 questionnaires to first year student’s and10 to second year students in each selected College of Education. In all, first year students received 260 questionnaires while the second year students received 130.

3.5.2 Interview

Interview can be explained as an oral questionnaire used to solicit the views of people concerning given issues or events. It is usually a face-to-face verbal relationship used rather than asking interviewees to write. There is the need for the interviewer to establish a good rapport between him and the interviewee before the interview is conducted. Interview questions could either be open-ended form or closed-ended form. The open-ended form calls for free response in the respondents own choice of words, while the close ended form calls for short checked list response. The researcher used the interview to collect information from resource person from the Curriculum Research Development Division CRDD. The researcher prepared a structured interview guide, looked on it and read out the questions for the respondent to give out his views. This helped the researcher to have first hand information on the types and nature of instructional materials prescribed to be used in the Colleges of Education. The interview guide includes a check list for the interviewer to tick the appropriate responses.

Secondary Data:

The secondary data consist of information that is related and relevant to the topic in order to solve the problem which was sourced from books, magazines, journal, brochures and the internet.

3.6 Administration of Instruments

The researcher took introductory letters to 13 of the selected Colleges of Education. The researcher fully explained the purpose of the research to the Vice Principals Academics of the selected Colleges seeking their approval. Tutors concerned were fully informed on the researchers' intension

to seek information through distribution of questionnaires. The Tutors concerned helped to assemble the target groups. The researcher briefed them on the items in the questionnaire. The questionnaires were distributed to 20 first year students who offer fundamentals in Visual Arts and 10 second year elective students. Some of the students filled and returned the questionnaire they received immediately while others were giving one week to complete and submit to their respective Tutors. The researcher visited the said colleges after one week to retrieve the questionnaires.

The Tutors of the 13 selected colleges were also given questionnaire a separate design for tutors to fill. However, seven other tutors were selected during one of the UTDBE end of second semester Vocational Skills, Fundamental in Visual Arts related subjects conference marking at Saltpond. The researcher distributed the questionnaire to the Tutors to answer and collected them later on in the day. The researcher used a structured interview guide and had a face to face interview with a resource person from CRDD.

3.7 Data Collection Procedure

Questionnaires and interview guides were developed by the researcher guided by the objectives of the project being studied. Copies were made available for colleague tutors for their corrections and inputs. The researcher went ahead to administer a few of the questionnaires to selected students to ascertain their reliability and efficiency of its intended purpose. Finally, the necessary corrections

were made, vetted and approved by the supervisor. Questionnaires were prepared for Teacher-Trainees and Tutors of Visual Arts related subjects

3.8 Design and Production of Proposed Instructional Materials

i. Materials and tools used for the project

The materials suitable for this project were identified as plywood, 2x6 “Bako” red, wood, screws, acrylic paints (white, blue, red and yellow) were purchased form the local market. Tools required for this project were identified as painting brushes, set of

T – Square, compass, protractor, saw, wooden plane, rule, sand paper, chisel, ban saw, and spoke shade.

ii. Preparation of materials

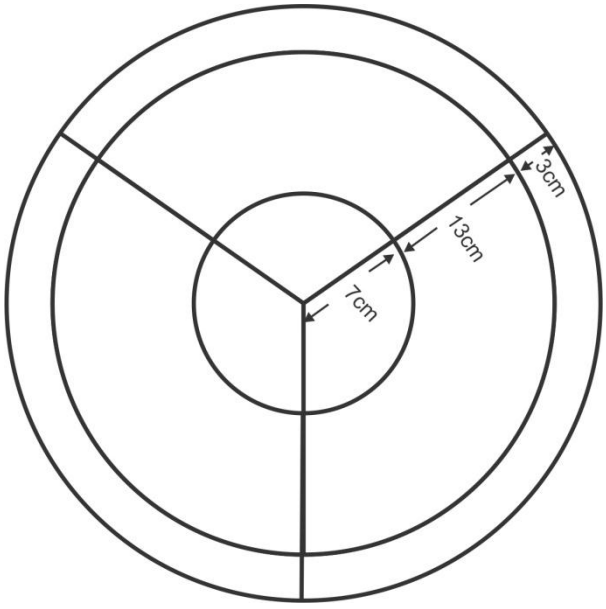
Plywood was cut into a disc of about 48 centimetres in diameter. Ban saw machine was used to cut the plywood into circular shapes. Spoke shade was used to trim and dress the edges of the circular shape and sand paper was used to make the edges and the working area smooth.

The stand was made up of three pieces of 'Bako' red wood. The base was constructed with a wooden stand. The stand is made up of three pieces of wood. The base stand measured 5x10cm wide and 40.5cm long. The height of each piece of wooden stand measured 70cm high and 4x10cm wide.Wooden plane was used to make the surface smooth. Chisel was used for 'mortise' that is making holes at the centre of the wooden stand to ease movement of the stand in case one wanted to increase or decrease the height of the stand. The screws were used to hold the disc or wheel at the centre to a wooden batten making it easier to rotate.

iii. (a) Design of teaching-Learning materials

The researcher made series of preliminary sketches on colour wheel beginning with three point colour wheel comprising primary colours of light and pigment as shown in fig. 1a

Figure 1a: An outline for three point colour wheel



From the diagram above a pair of compass was used to construct a circle. The circle was divided into three equal segments. Two other smaller circles were drawn within the bigger one. The radius of the circle is 23cm. one segment of the circle is 120cm wide, the total circumference of the circle add up to 360^{O} in centimetres. The outer circle is 3cm wide. The middle circle measured 13cm while the radius of the inner circle is 7cm. The figures on this diagram only suggest the dimension on the final teaching-learning material designed.

A similar design was made and labelled (red, blue and yellow) as in fig 1b. This was designed to guide the researcher in constructing a three point colour wheel meant for teaching colour work.

Figure 1b: Design for primary colours of pigment

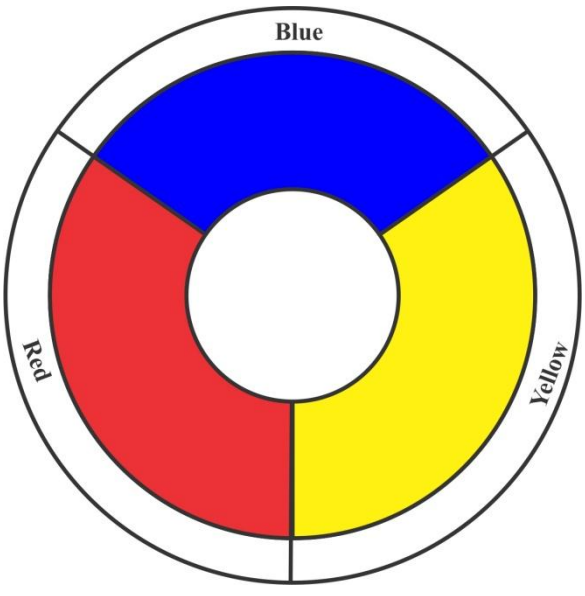
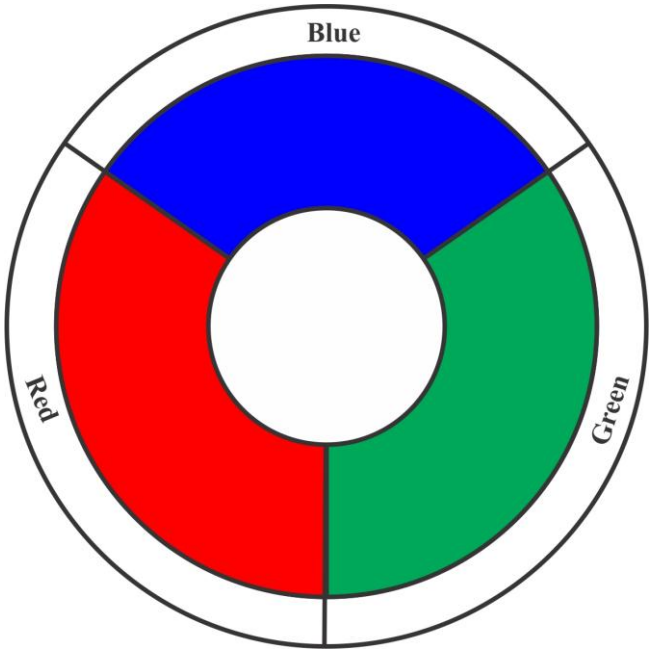


Fig.1c is a design meant to be used in constructing the primary colours of light. The design is similar in shape and outlook to figure 1b but the dimension differs. The outer circle measured 3cm. the middle circle measured 13cm and the inner circle has a radius of 7cm.

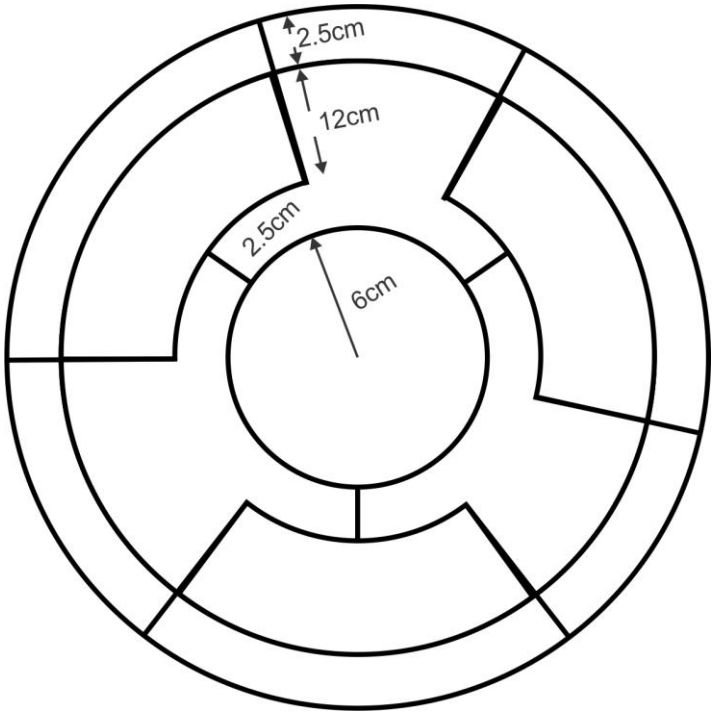
Figure 1c: Design for Primary Colours of Light



These dimensions were used to execute the final teaching-learning material designed and produced on 1/8 inches plywood and painted with acrylic paint.

(b) Designing six hue colour wheel comprising the primary and secondary colours: a dimension of 46cm in diameter and a radius of 23cm were maintained.

Figure 2a: An outline for six point colour wheel

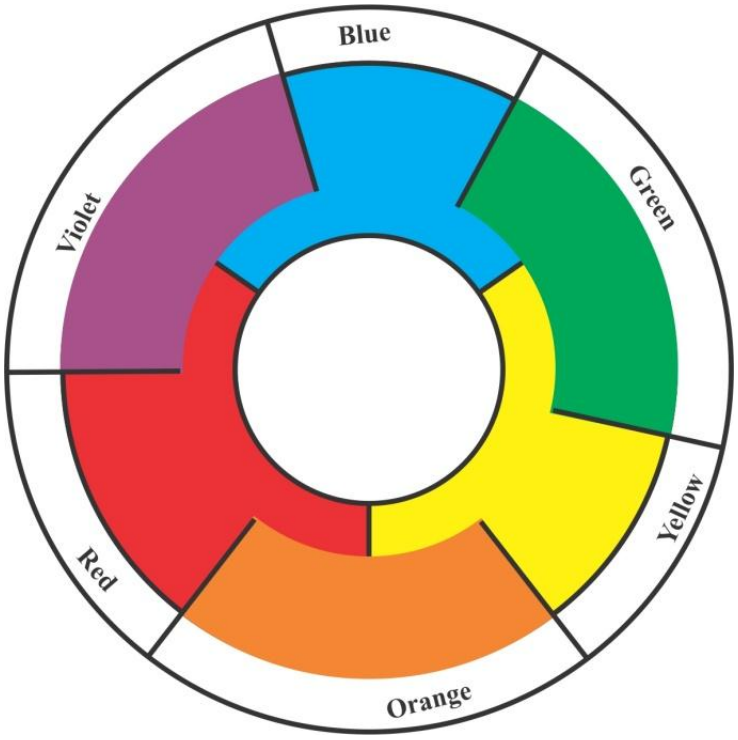


In Figure 2a, a pair of compasses was used to construct a big outer circle. The segments were six; three smaller circles were constructed within the bigger one. The dimension of the outer circle measured 2.5cm, the second circle which is the biggest measured 12cm, the third circle measured

2.5cm and the inner circle has a radius of 6cm. The segments where the primary hues were painted were joined at the base of the third circle.

A similar design with the same dimension was constructed in Figure 2b below.

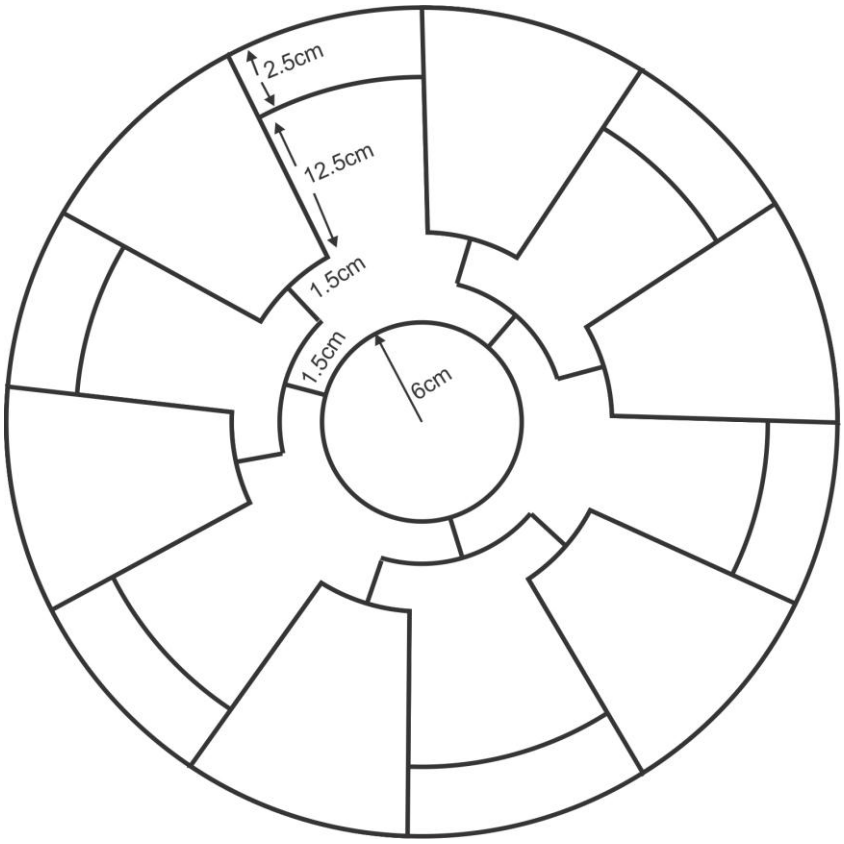
Figure 2b: Design for six point colour wheel



The segments have an angle of 60^{o} and the circumference of 360^{O}. The segments were labelled Red, Violet, Blue, Green, Yellow and Orange. The primary colours were designed to have an intersection at the base of the colour wheel, with their mixture painted in-between the two primary colours.

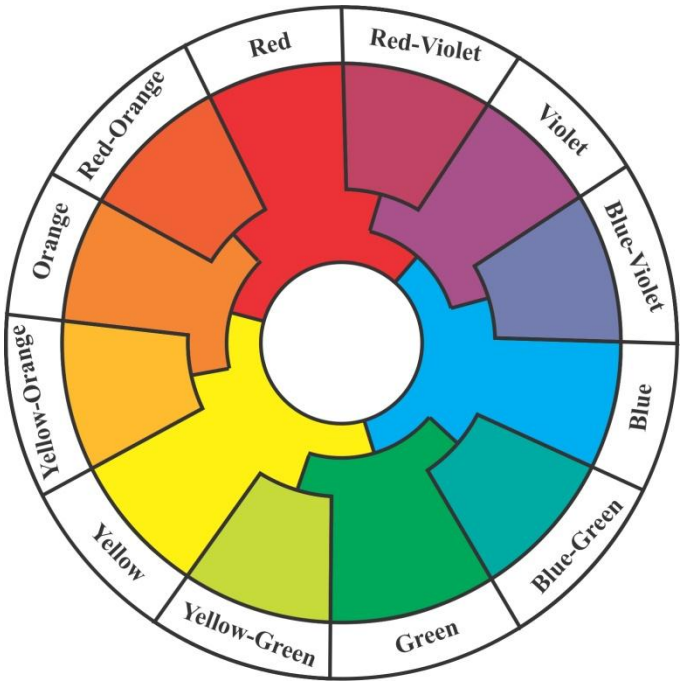
(c) The 12 point colour wheel was designed with a diameter of 48 cm and radius or 24 cm inside the circle.The segments for the various colours at an angle of 30^{0}.

Figure 3a: An outline for 12 point colour wheel



With the help of a protractor, 12 segments were constructed in a big circle. The lines were extended from the centre to the outer circle. There are five circles in all with varied sizes. The outer circle has a dimension of 2.5cm; the next circle second from the top has a dimension of 12.5cm. This is followed by another two circles measuring 1.5cm each. The inner circle has a radius of 6cm. The first and the second circles have 12 divisions which ended at the beginning of the third circle. The third circle from the top has six divisions. The fourth circle which formed the base of all the design has three divisions. A detailed explanation is given in the next section.

Figure 3b: A design for12 point colour wheel

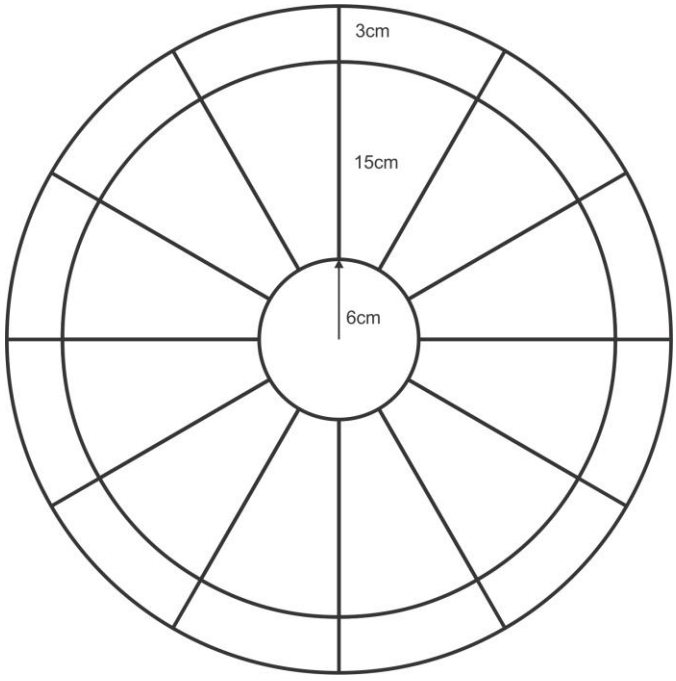


The segments were labelled Red, Red-Violet, Violet, blue-violet, Blue, Blue-Green, Green Yellow-Green, Yellow, Yellow-Orange, Orange and Red-orange. The primary colours intersect at the base of the design that is 6cm radius from the centre of the wheel. These primary colours are Red, Blue and Yellow. Just after that, there is another circle measuring 2.5cm in width which is divided into six segments on top of the primary colours. This indicates the six point colour wheel fused into a bigger wheel. The colours indicated on these sections are Red, Violet, Blue, Green, Yellow and Orange.

The next circle measured 12.5cm wide and has 12 segments. The segments were constructed, each at an angle of 30º the centre of the wheel. The segments were labelled Red, Red-Violet, Violet, Blue-Violet, Blue, Blue-Green, Green, Yellow-Green, Yellow, Yellow-Orange, Orange and Red-Orange.The indication here was that, a mixture of a primary colour and an adjacent secondary colour will result to an intermediary or intermediate colour.

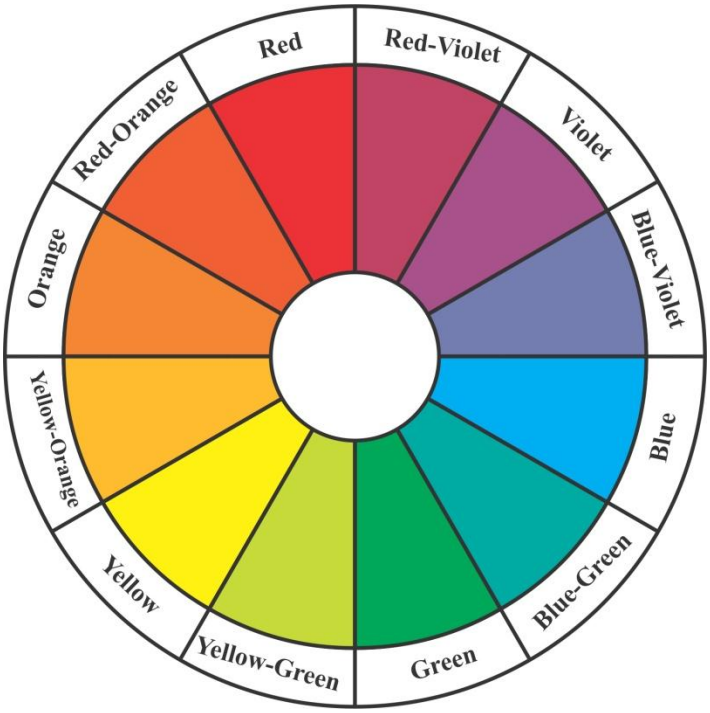
Fig. 4a is an alternative design for a 12 point colour wheel. A pair of compasses was used to construct a circle. Two other circles were constructed within the bigger circle. The dimension indicated in the outer circle measured 3cm, the middle circle measured 15cm and the inner circle measured 6cm.

Figure 4a: An alternative design outline for 12 point colour wheel



A protractor was used to guide the drawing of 12 segments with the centre of the circle as the focus. A ruler was used to extend the lines from the centre to the top. The segments were labelled as follows: Red, Red-Violet, Violet, Blue-Violet, Blue, Blue-Green, Green, Yellow-Green, Yellow, Yellow-Orange, Orange and Red-Orange as shown in Fig 4b.

Figure 4b: An alternative design for twelve (12) point colour wheel



The drawn designs do not measure to the figures assigned to them. They are only a scale of the figures that will be used in executing the final designed teaching-learning material.

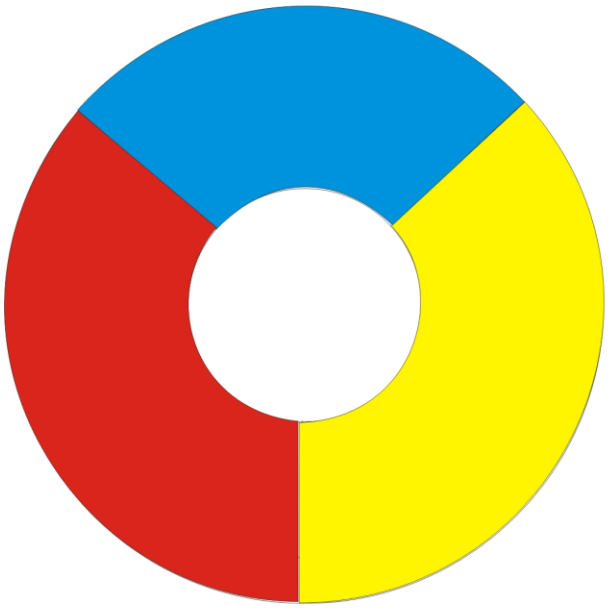
(iv) **Construction of Teaching-Learning materials**

The basic techniques known to teacher-trainees in the construction of teaching-learning materials was to draw them in a sketch book or drawing sheets using crayon, colour, pencils and poster colours. These works easily got destroyed within a short time since the materials used are not durable. The purpose of this practical project was to make a permanent teaching-learning material using varied designs and a more durable working surface. Acrylic paint was used to produce the colour wheel which could be used in teaching colour work.

Project One: **Construction of three point colour wheel.**

The materials and tools required include a circular disc of about 46cm in diameter and a radius of 23cm. It was made from 1/8 inch plywood. White acrylic paint was used to prime it. A protractor was used to construct an angle of 120^0. Three equal segments were constructed in the circle. Acrylic paint was used to paint out the primary colours of pigment, Red, Blue and Yellow in the segments as shown in Fig 5a.

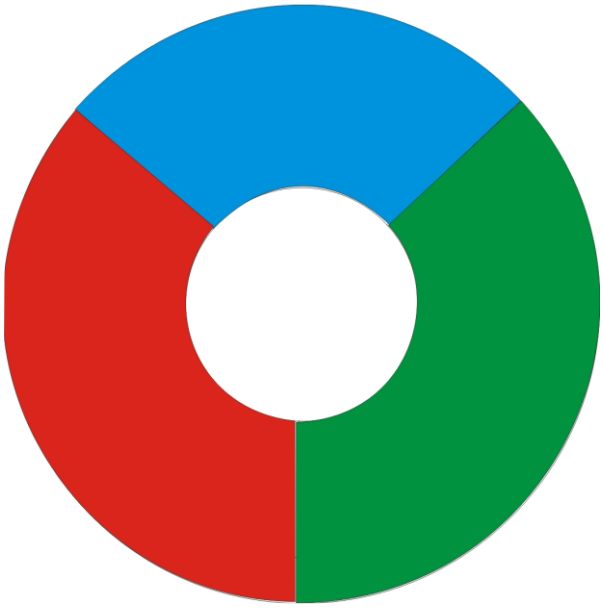
Figure 5a: Primary colours of pigment



Black marker was used to deepen the lines. A space having a diameter of about 16cm was left at the centre of the disc. This is to differentiate the colour work from the background.

The primary colours of light have Red, Blue and Green. The material and tools required include a prepared circular disc of 46cm in diameter and the radius of 23cm. It was prepared from 1/8 inches plywood. The outline for three point colour wheel in Figure 1a was transferred onto the disc which was primed with acrylic white paint. With the help of sable brushes the segments were painted red, blue and green. Black maker was used to mark out the outer lines as shown in Fig. 5b.

Fig 5b: Primary Colours of light



Project Two: Construction of Six Point Colour Wheel.

A prepared disc made from 1/8 inches plywood having a diameter of 46cm and a radius of 23cm was used. White acrylic paint was used to prime the surface. A protractor and a

pair of compasses were used to construct an angle of 60^0 from the centre of the disc. The lines were extended to the top of the circle of the disc. The circle was divided into six equal segments. This was done in accordance with the design in figure 2b. The inner circle has a radius of 6cm. The next circle to the inner one measured 2.5cm in radius. The third circle which is the biggest measured 12cm wide.

In constructing the six point colour wheel, the outline in figure 2b was transferred onto a disc at about 46cm in diameter. Apart from the inner circle having a radius of 6cm, the next circle to the inner one measuring 2.5cm in radius. The third circle which is the biggest measuring 12cm and the outer circle were all painted.

Figure 6: Six point colour wheel

The segments were painted Red, Violet, Blue, Green, Yellow and Orange. The centre which is not painted is 12cm in diameter. The colours: Red, Blue and Yellow are primary colours which are joined at the centre. These colours formed the primary colours of pigment. The other three colours were derived from mixing two of the primary colours. These colours are therefore painted in between the primary colours. These colours obtained as a result of mixing two primary colours are

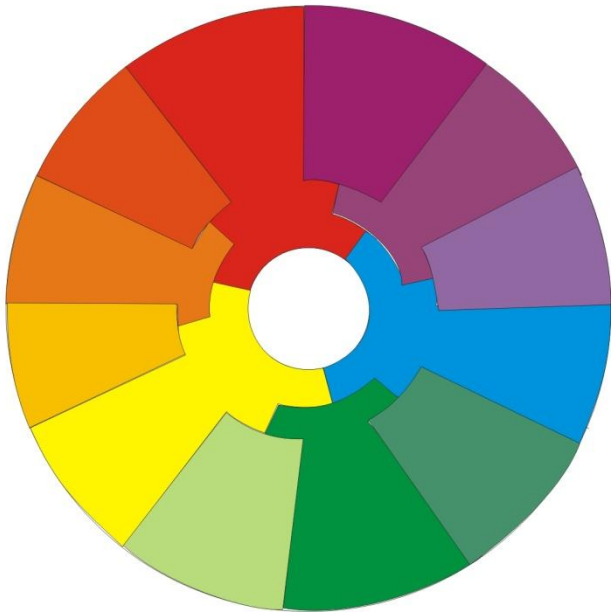
described as secondary colours. They are, Red + Blue = Violet, Blue + Yellow = Green and Yellow + Red = Orange.

Project Three: Construction of 12 point colour wheel:

A prepared disc made from 1/8 inches plywood measuring 46cm in diameter and having a radius of 23cm was used. White acrylic paint was used to prime the disc. With the aid of a protractor and a pair of compass, an angle of 30^0 was constructed at the centre of the disc. The lines were therefore extended to the top of the disc. The twelve (12) segments created on the disc were of equal distance. Four other smaller circles were created in the bigger circle with varied dimension. From the centre, the inner circle has a diameter of 12cm and a radius of 6cm in width, whiles the second and third circles, counting from the centre are also constructed measuring 2cm in width. The next circle which is the biggest and the third circle from the centre was constructed measuring 13cm wide. The outer circle which was used as border line measured 2cm in dimension.

Acrylic paint was obtained and used in painting on the disc. The primary colours were painted first. The placements of the colours on the disc are equidistant to each other. Two of the primary colours are then mixed in a required proportion to obtain the secondary colours which are also painted at the central segment adjacent to the primary colours. Furthermore, two of the hues, the primary and secondary colours adjacent to each other are mixed in a given proportion to obtain intermediate colours. These are also painted on the segments on the disc designed.

Figure 7: Twelve point colour wheel (1)



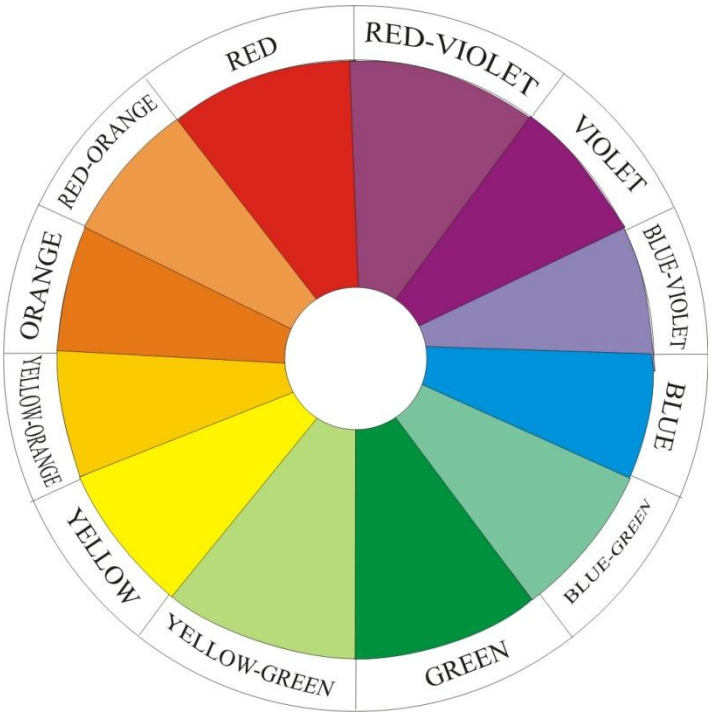
The colours found on the twelve point colour wheel in figure 7 are; red, red-violet, violet, blue-violet, blue, blue-green, green, yellow-green, yellow, yellow-orange, orange and red-orange.

Project Four: Complementary and Split Compliment of Colours.

There is an alternative design indicating the 12 hues in a simple 12 point colour wheel. The researcher intended to use this design to teach complementary and split complements of colours. The dimension and measurement as indicated in Figure 4b was used in constructing the outline of

the work. The processes used to obtain the various hues are similar to the other 12 point colour wheel.

Figure 8: Twelve point colour wheel (2)



This design is very simple and could be used in teaching complementary and split complement of colour as well as colour terminologies.

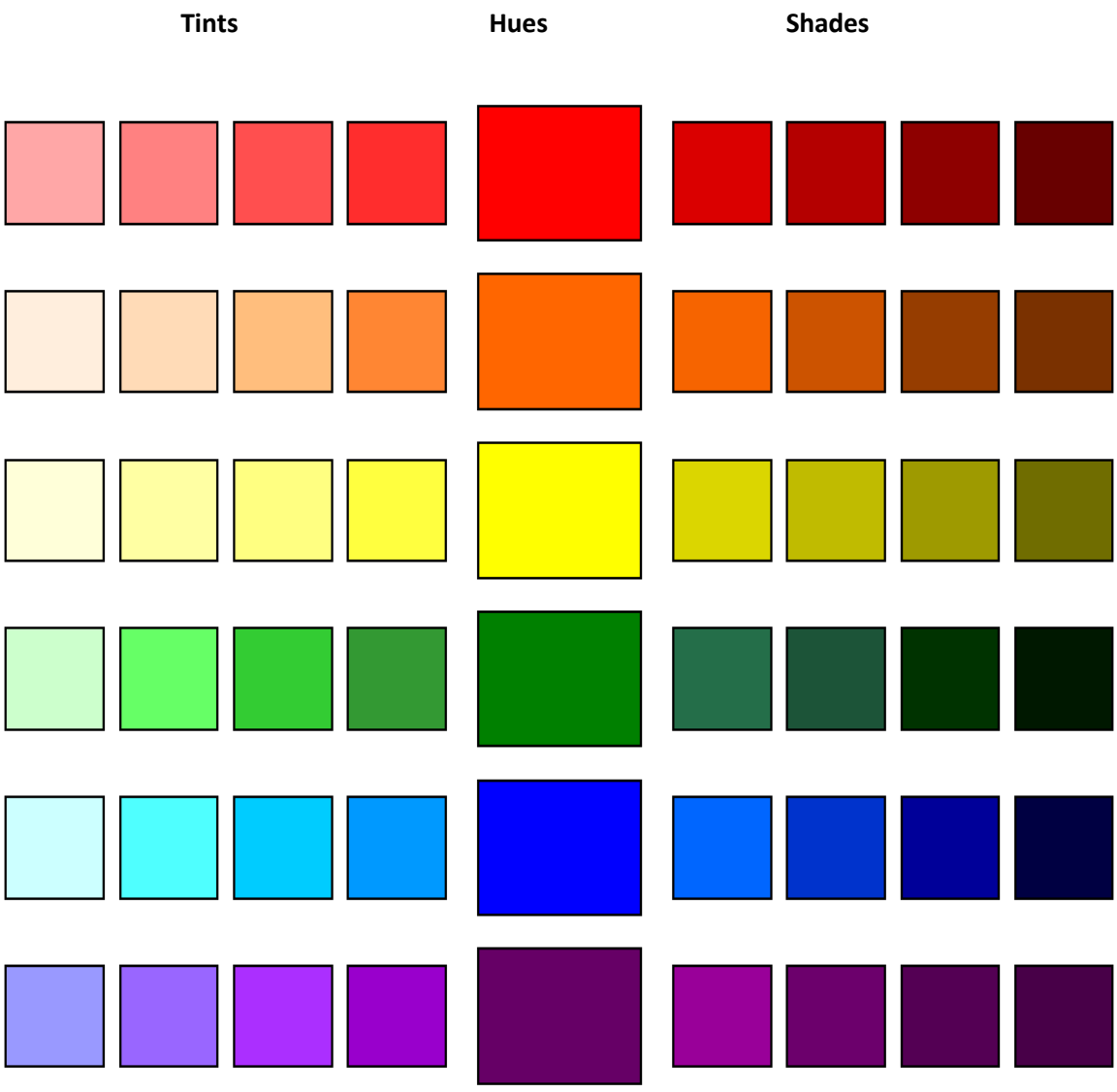
Constructing a wooden stand

Materials required for constructing the wooden stand include, soft Bako wood or red wood and screws. Three separate pieces of softwood were cut using the saw. The wooden plane was used to make the surface smooth. A chisel was used to make a mortice on the front surface of the wood. This was done to enable the ends of the pieces to hold together firmly. The length of each piece measured 70cm. The upper surface of the piece of wood measured 4x10cm. The base of the stand was made from a strong Bako wood. The foot stand was crisscrossed. The piece of wood measured 40cm long and the width is 5x10cm. Two butterfly screws were fixed at the joints of the meeting ends of the stand. This helped to hold the stand firm when one wants to increase or decrease the height. Other smaller screws were used to fix the disc with the designs to a short batten which was fixed at the back of the disc. The batten at the back was designed to be fixed to a wooden stand to hold it at position.

Project Five: constructing a chart to teach colour interaction.

Materials and tools include either bleached or unbleached calico or any other thick fabric, acrylic paint (White, Blue, Yellow, Red and Black), manila card, brushes and pencils.

Figure 9: A chart on colour interaction



White glue was mixed with thinner and used to prime the canvas or fabric which served as a background. This is done to enable the paint or ink to fast well on the fabric. The six hues made up of the primary and secondary colours were painted first, at the column created at the centre. Tints and shades of four colours were then mixed and painted on the chart.

Project Six: Exploration of tools and materials

Identification of materials and Tools: materials needed include: potassium permanganate (suede), poster colours, charcoal, pencil, crayon, marker, felt pen, pastels, oil paint, acrylic paint, vat dyes, plants leaves, roots, barks, deferent types of clay, soot and charcoal. Various tools, brushes, sticks, stones, pebbles, seeds, feathers, etc. were used to create movements. The marks were created either by dragging, twisting, rolling, splashing, spraying, printing, dotting, scribbling and stamping.

Procedure:

A fabric which was primed served as a background. Different colours were applied on different surfaces and used to create marks or designs on the background to create texture.

Plate 1: Exploration of tools and material

Project Seven: Organizing Selected Natural Elements of Design

Procedure: Natural elements of art or design were collected from the environment. These comprised: seeds, pebbles, shells, flowers, leaves and bark of trees, rope, hair of human and fair of animals, feathers, clay. Photographs were taken on selected natural elements of design such as lines, shapes, texture, and colour. Some real objects that could be used to teach elements of designs were kept as model piece.

Plate 2: Identification of natural dots (seeds)

Plate 3: Identification of natural lines (roots of creeping plants)

Plate 4: Identification of natural shapes (pawpaw)

Plate 5: Identification of natural texture (bark of tree)

Plate 6: Identification of natural colours (flowers)

Project Eight: Creating Man-Made Elements of Design

Materials and tools needed include: bleached and unbleached calico, paint, dyes or colours, cassava or cocoyam tuber, brushes and textured surfaces such as bark of trees

Procedure: A primed fabric of about 40cm.. The techniques of drawing, shading, splashing, printing, flicking, spraying, sprinkling, twisting were used to create different man-made elements of design on the surfaces.

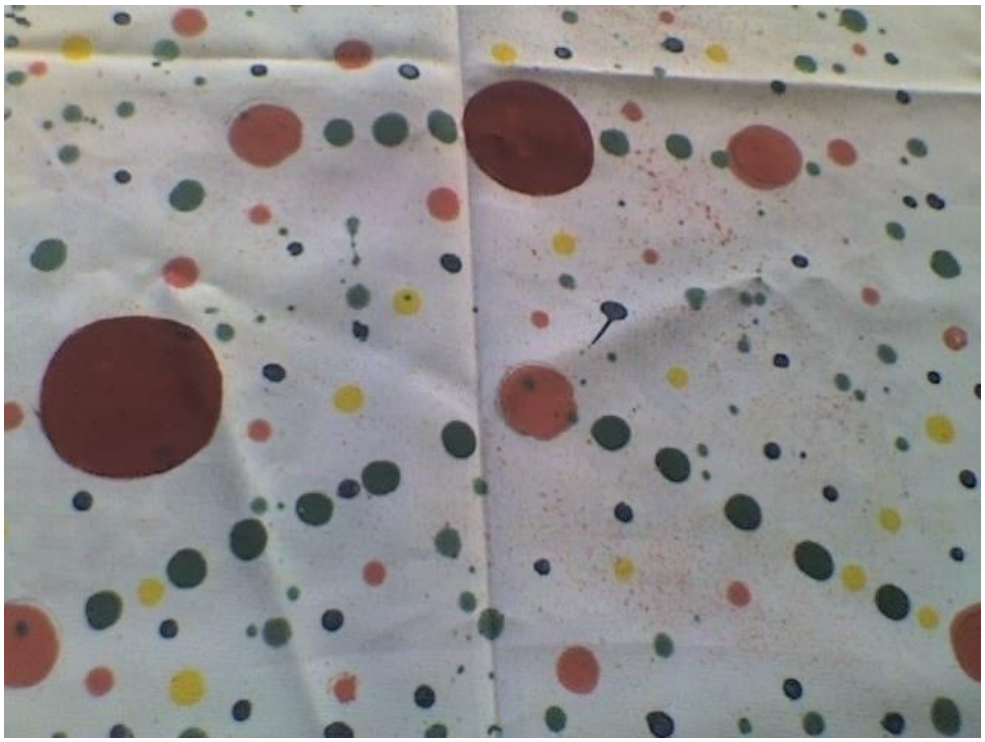


Plate 7: Identification of artificial dots on fabric

Plate 8: Identification of lines

Plate 9: Identification of regular and irregular shapes

Plate 10: Identification of artificial texture

Plate 11: Identification of colours

CHAPTER FOUR

PRESENTATION AND DISCUSSION OF FINDINGS

4.0 Overview

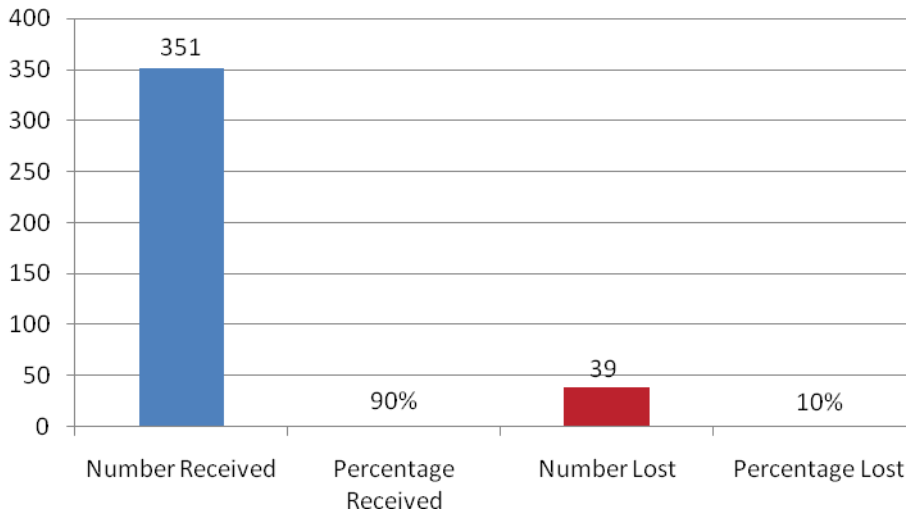
The purpose of the chapter is to explain the results of the practical project on teaching-learning materials produce and discuss the findings.

4.1 Results of questionnaire for teacher-trainees

The section A of the questionnaire required information on names of the selected Colleges and gender of respondents. Section B required information on the types of teaching-learning materials used in selected colleges for the teaching and learning Visual Arts.

The chart below illustrates information on questionnaire distribution

Chart 1. Questionnaire Distribution



The chart above shows that the total number of questionnaires distributed was 390. Out of these, 351 questionnaires were received representing 90% and 39 questionnaires representing 10% were lost.

Students' responses indicated that tutors in the Colleges of Education use some teaching- learning materials in teaching Visual Arts. The responses indicated that tutors sometimes use 3-Dimensional objects such as sculptural pieces, model pieces in ceramics as sample for visual materials.

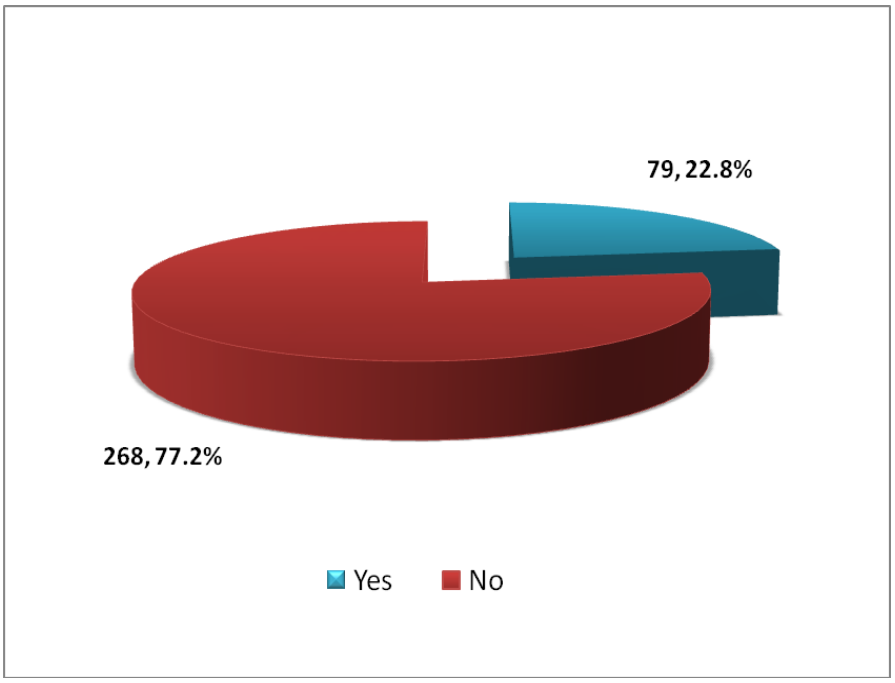
The respondents' views on the use of printed material in teaching Visual Arts illustrate that, handouts prepared by the tutors and workbooks are mostly used. Only few respondents indicated the use of textbooks. Programmed materials such as recorded audio-visual or videos are not being used in teaching and learning of Visual Arts in the colleges. However, most colleges are using felt board instead of chalkboard. This means most tutors use white board makers instead of chalk in writing during Visual Arts lessons.

Respondents' responses on the use of still pictures indicated that most tutors do illustrations on the chalk or felt board when teaching practical lessons in Visual Arts rather than using long projected photographs, projected slides, film slides, overhead projectors and transparencies and opaque projectors some of which are available in the selected Colleges.

Responses from respondents on the use of graphic materials indicated that posters are mostly used than charts and diagrams. Graph material such as graph board, maps and globes are not used in teaching Visual Arts in most of the colleges.

The chart below illustrates information on whether college administration provides teacher-trainees with materials for their practical work in Visual Arts.

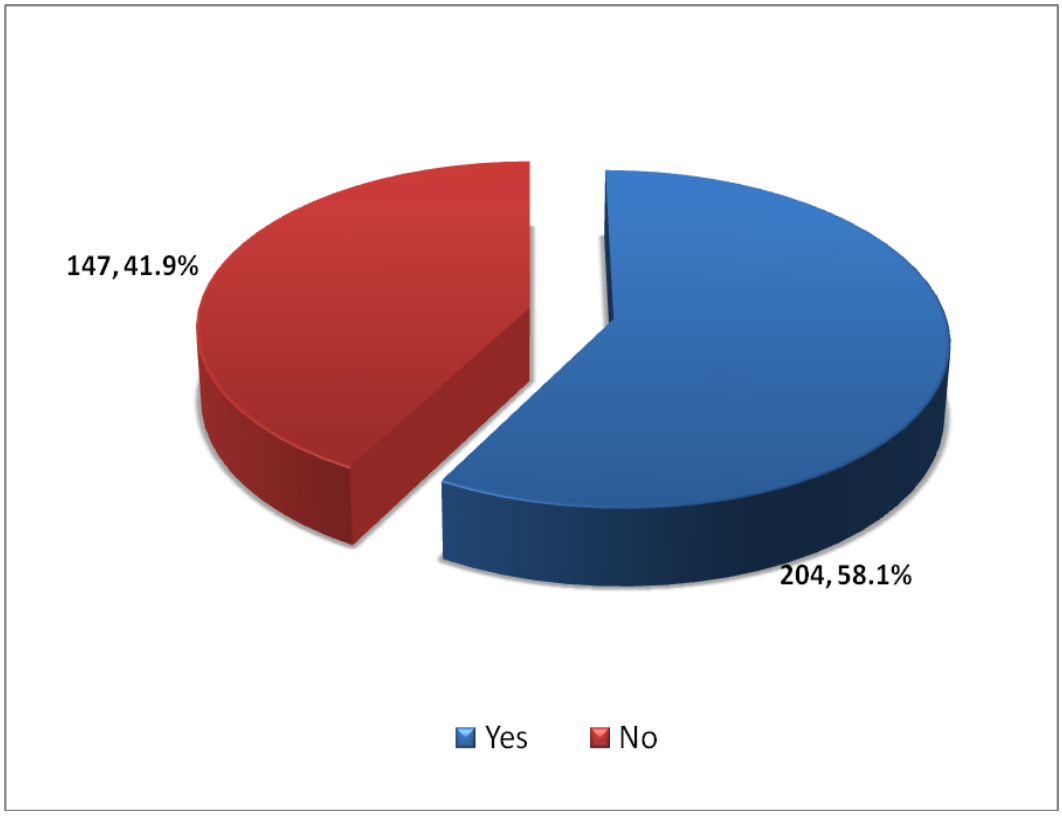
Chart 2: Chart on provision of teaching-learning materials for students work



The study found that most college administration do not provide materials for individual students for their practical work in Visual Arts. 79 respondents stated "**Yes"** representing 22.8% while 268 respondents stated "**No"** representing 77.2%

The chart below provides information on provision of instructional materials for teacher trainees by the tutors of the colleges of Education.

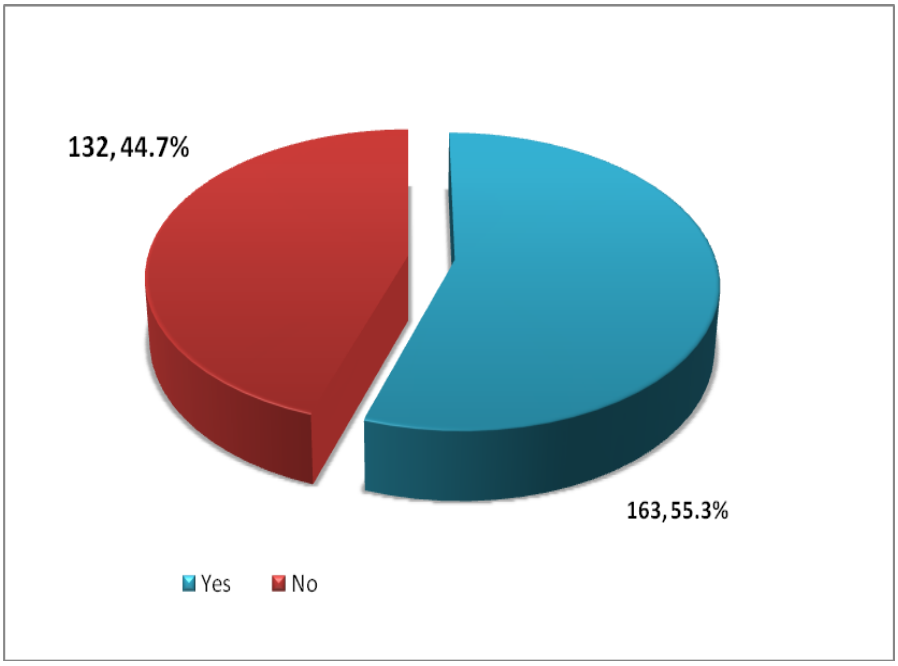
Chart 3: Responses on whether tutors provide materials for students use during teaching.



The responses indicates that out of 351 respondents, 204 respondents indicated **"Yes"** representing 58.1% while 147 respondents indicated **"No"** representing 41.9%

On preparation of teaching-learning materials by students and the types of material used, the chart below give further information.

Chart 4: Responses on preparation of teaching-learning materials by students.



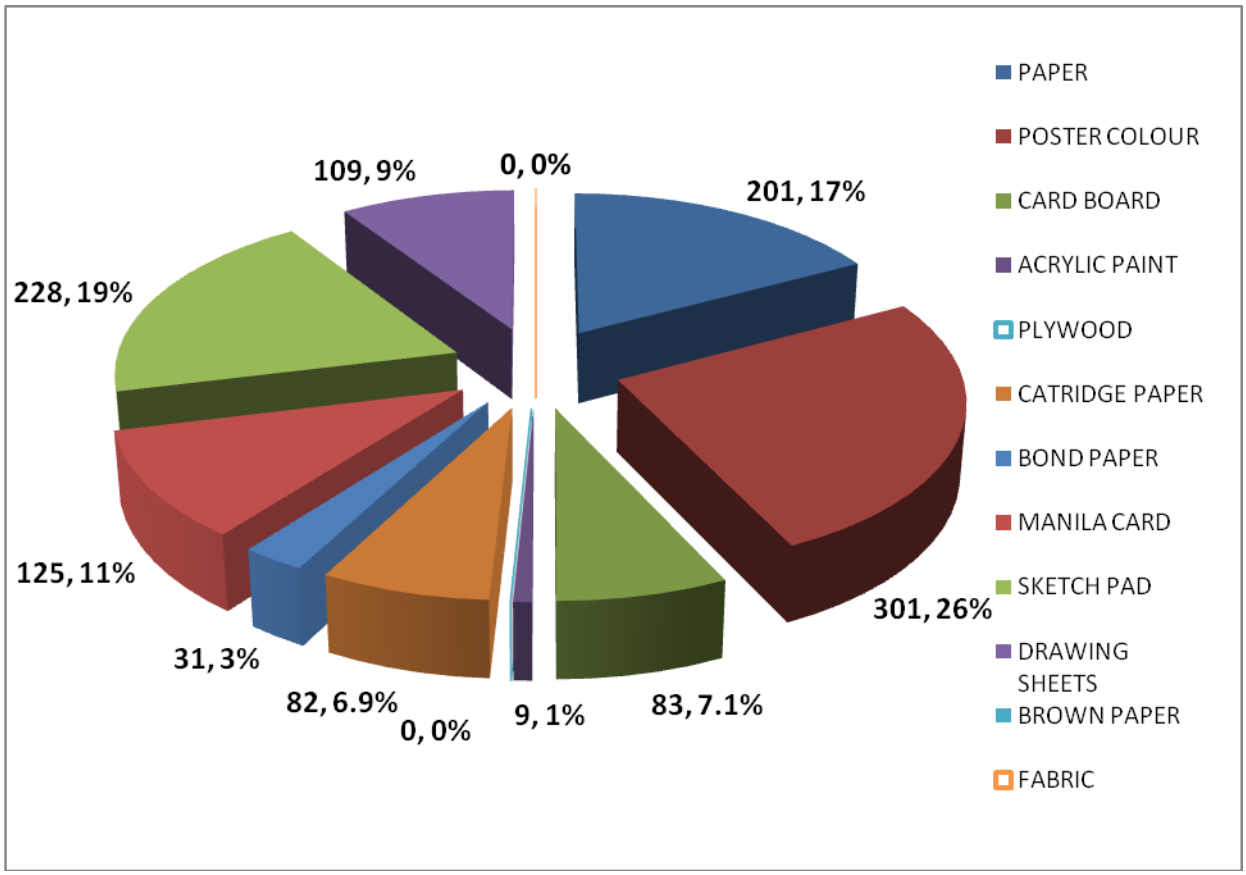
Responses from 163 respondents representing 55.3% indicate that students prepare teaching-learning materials while 132 respondents representing 44.7% indicates the number who doesn't prepare teaching-learning materials.

Teaching-learning materials prepared by students include drawing on pieces of paper, illustrations and sketches made on paper, poster and collection of 3 dimensional objects from the environment. Response from the questionnaires indicated that students use materials such as manila cards, colour (poster and sudee) crayon, colour pencil, pencil, milk tins, clay, paper, glass, water, seeds and dyes in preparing teaching-learning materials. Students indicated among others that, the

simple tools used in preparing teaching-learning materials are: a pair of compass ruler, pencil, lino-cutter, pair of scissors, bodkin, needle, bloom sticks, rolling pin, knife, sieve and flat working surfaces.

Responses from the questionnaire indicated that teacher-trainees learn about colour work. The materials used in preparing their colour work were indicated on the chart 4 below.

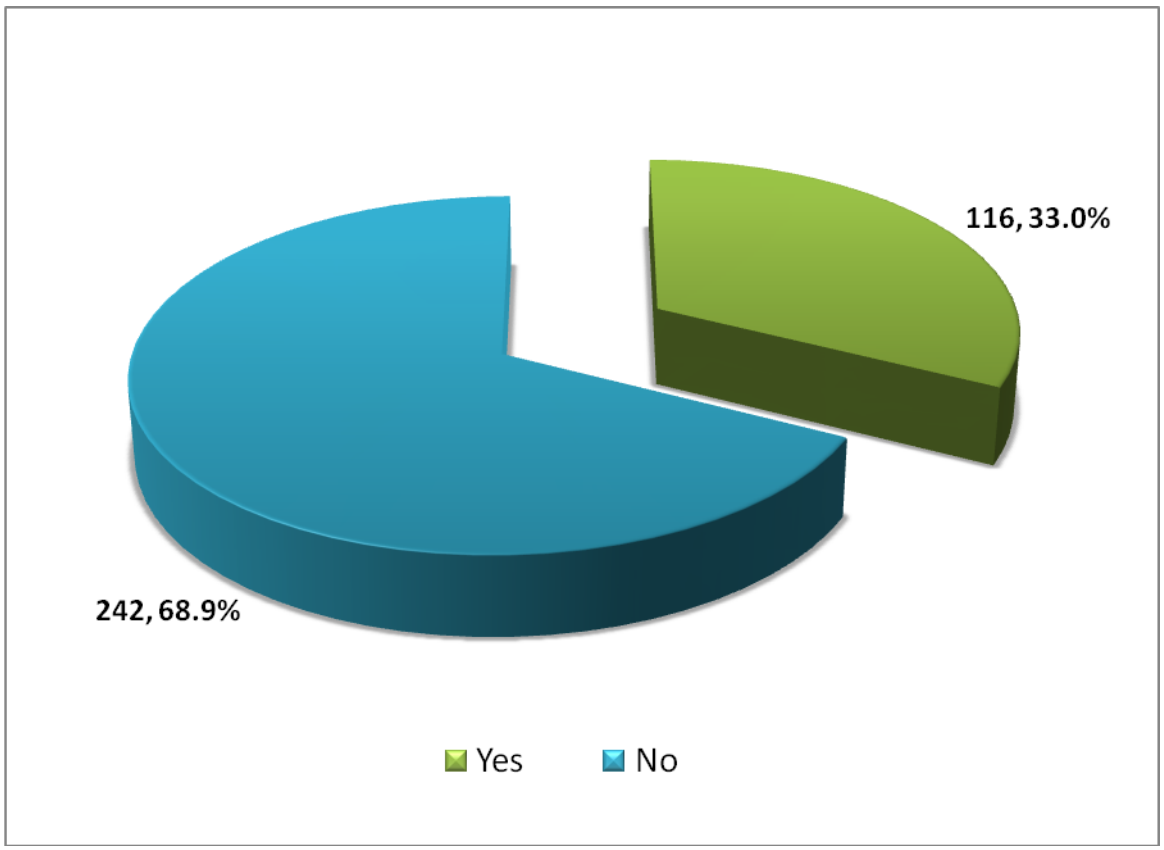
Chart 5: A chart illustrating materials use in preparing colour wheel.



The study indicate that, 201 respondents representing 17.0% stated the use of paper and 301 representing 26.0% stated the use of poster colour in doing their practical in colour work. One hundred and twenty-five representing 11.0% and 228 representing 19.0% stated the use of manila cards and sketch pads respectively. One hundred and nine representing 9.0% stated the use of drawing sheets while 83 and 82 representing 7.1% and 6.9% respectively used card and cartridge paper. Thirty one respondents representing 3.0% and nine representing 1.0% stated the use of bond paper and acrylic paint respectively. Materials such as plywood, fabrics and brown paper are not used for colour work in the Colleges of Education.

Responses from the questionnaire seeking information on whether tutors use already prepared teaching materials in teaching.

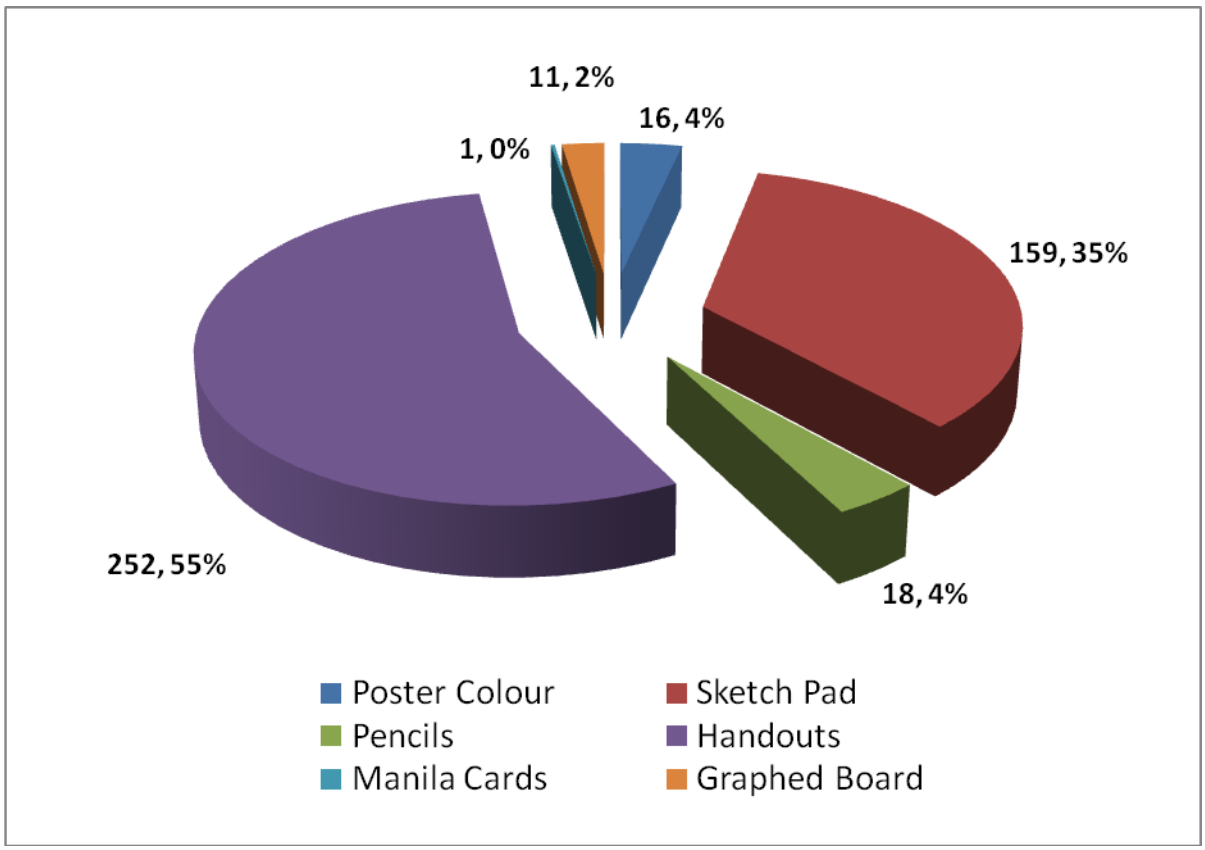
Chart 6: The chart below illustrates responses on the use of already prepared colour wheel by tutors to teach.



From the responses indicated by the respondents, 111 respondents representing 33.0% stated **"YES".** The remaining 242 representing 67.0% stated **"NO"** as their response. The total respondents are 351.

Response on the questionnaire indicates that some teaching-learning materials are supplied to students by the colleges. These include: poster colours, sketch pad, handout, manila cards, and pencils (2B, 3B, 4B, 5B, 6B).

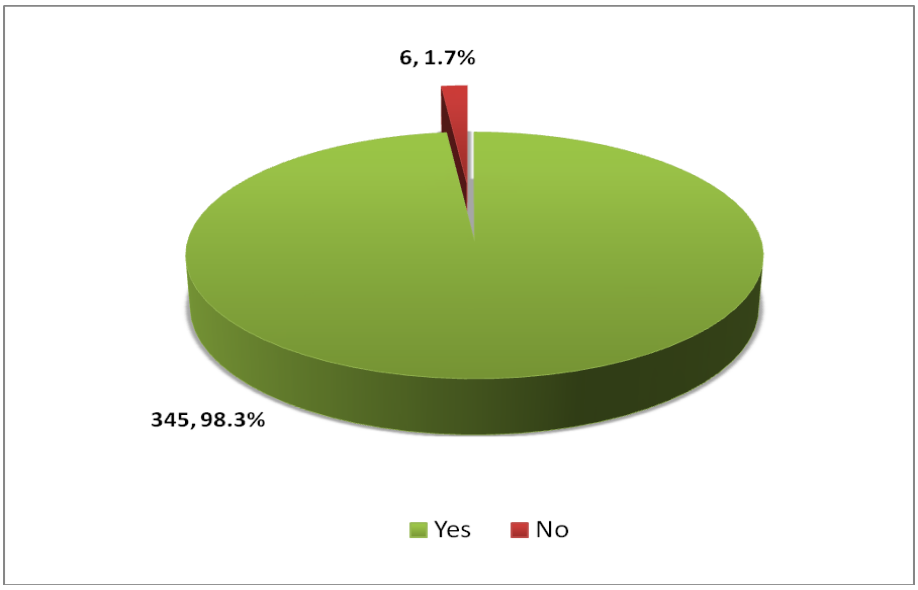
Chart 7: A chart below illustrating responses on items supplied by some Colleges for students use.



Responses from respondents indicate that, 159 representing 45.3% stated that sketch pad was supplied by the Visual Arts tutors for a fee. Sixteen respondents representing 4% stated that they were supplied with pencils. Two hundred and fifty-two representing 71.8% stated that Visual Arts tutors supplied Handouts to them for a fee.

Information gathered from respondents indicates that most students in the colleges of education have learnt about basic design.

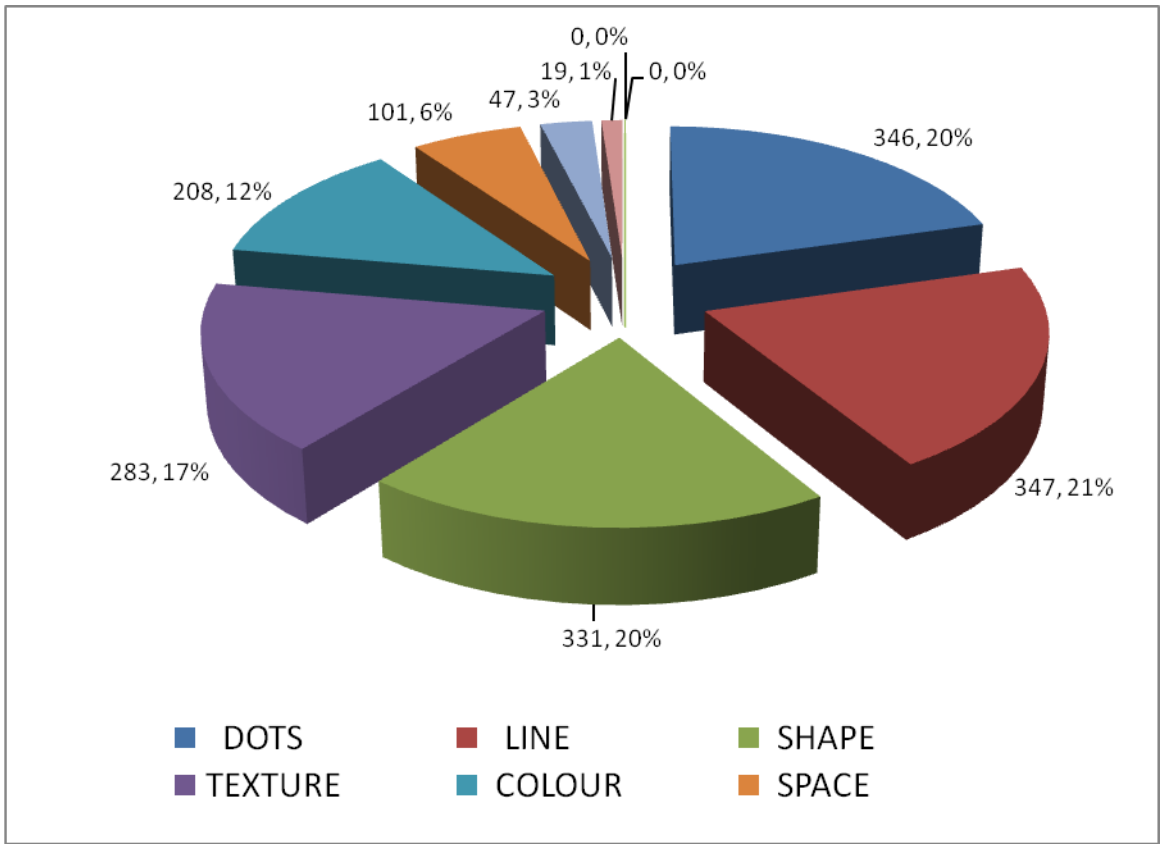
Chart 8: A chart illustrating responses on knowledge on basic design.



The study indicates that out of the total of 351 respondents, 345 representing 98.3% ticked 'YES'. This means that they have knowledge about basic design. It was only one respondent each from six selected colleges representing 1.7% who stated that they have not learnt about basic design. This was an isolated case. Perhaps the respondents did not fully understand the term basic design.

Respondents listed the following elements of design: line, shape, texture, colour, space, form and volume. However none of respondents listed plane and weight or mass as elements of design.

Chart.9: A chart indicating the elements of design listed by respondents.



The study indicates that most respondents used elements such as line, dot, shape and texture. However, only few respondents listed the use of elements such as plane, weight / mass and volume.

Summary of respondents' responses is as follows:

I. Materials used in teaching Visual Arts include models, specimen, handout, chalkboard, flannel or felt board, illustration, diagrams, and posters. These teaching-learning materials are produced using poster colours, pencils, felt pens, and in most cases using chalks or white board marker to illustrate them on the chalk or white boards.

II. Tutors sometimes procure materials like poster colours, manila cards, cardboard, A4 sheet, sketch pads and colour pencils for teacher-trainees to use in a practical lesson.

III. College Administration hardly provides materials for practical work in Visual Arts to individual students for their course work.

IV. The types of teaching-learning materials they make are prepared on manila cards, sketch pads and A4 sheets. The basic techniques used are sketches, drawing and shading. They also use poster colours, pastels, pencils, colour pencils, markers, felt pens and brushes in preparing the Visual materials.

V. Tutors do not bring already prepared chart on colour work to the classroom. The techniques on how to prepare the colour wheel are taught by the tutors and they guide students to design the colour wheel.

VI. No tutor in the selected colleges used Audio Aids such as radio, record player and tape recorder. Audio-visual aids such as motion pictures, television, audio conferencing, computer conferencing and video, are not used in teaching Visual Arts.

VII. Materials mainly used in most of the colleges in preparing colour wheel are paper, poster colour, crayon, colour pencils, sketch books and drawing sheets. This reflected in their response to the questionnaire.

4.2 Results of questionnaire for tutors in the Colleges of Education

The section **"A"** of the questionnaire required information on name of College, gender, highest qualification and areas of specialization in Visual Arts. Seven tutors teaching in the colleges of Education were served with the questionnaire during one of the marking section for UTDBE Examination. The researcher was able to retrieve the entire seven questionnaires. These were added to 13 tutors in the selected colleges visited earlier on by the researcher. This brings the total questionnaire distributed to 20.

Section **"B"** seeks responses on specific items required in the questionnaire. All the tutors in the selected Colleges ticked **"YES"** as their response to confirm that they use teaching learning – material in teaching Visual Arts. Apart from two respondents who indicated that their College Administration provides funds for the purchase of material for practical work for tutors use. Eighteen of the other respondents stated that they provide their own materials for practical work.

Eighteen of the tutors agreed that students provide their own colour or ink for practical work. They listed the following: poster colour, pastel, crayon, colour pencil and potassium – per magnate (sudee) as colour or ink for colour work.

Fifteen tutors gave their response on the use of already prepared chat for colour wheel to teach about colour to be **"NO"** whiles the other five gave their responses to be **"YES".** In response to the questionnaire item on how to teach colour work, five tutors chose the option (a) by using the chart on colour wheel to be **"YES".** Six tutors indicated **"YES"** for option (b) by demonstrating how to draw the colour wheel on the chalk/white board. The remaining nine tutors chose option (c) by guiding students through instruction to draw the colour wheel.

Respondents' responses on how they acquire teaching-learning materials for the course work indicate that they:

- Collect relevant materials form the environment: all the tutors indicated **"YES".**
- Draw them for the students: all the tutors indicated **"NO"**.
- Demonstrate how to make them through drawing on the chalk/white board in the class room: responses for 18 of the tutors indicated that they do demonstration for students to see and practice.
- Ask students to draw them on their own: all tutors ticked **"NO"** as their response
- Administration provides funds to purchase them: 18 tutors ticked **"NO"** while two tutors ticked **"YES"**.
- NGO's support by providing funds: all the tutors ticked **"NO"** as their response.
- Students are asked to provide their own materials: all the tutors ticked **"YES"** as their response.
- Resource centres in the colleges provide them: tutors responses indicate that, the resource centres at the colleges do not provide teaching-learning materials for students but rather help students to prepare their own materials.

Twelve tutors did not state how they acquire teaching-learning materials for the course work. However some of the means stated by tutors include: gather them from the environment and design on the manila cards.

Three tutors' responses indicate that they pick some of the teaching-learning materials from their College Resource Centres. The responses from all the 20 tutors indicated that they teach exploration of tools and materials at the Colleges of Education. Some of the responses on teaching exploration of tools and materials are: picking materials from the environment and trying out how effective it could be used in art work, trying out tools, testing the efficacy of tools and materials, collecting and trying materials, experimenting with how effective tools and materials can work and finally using tools and materials to do trial work to check their effectiveness.

The type of material used to teach exploration of tools and materials are: real objects or materials such as charcoal sticks, markers, papers, crayon, dyes and poster colours. None of the tutors mention any specific teaching-learning materials such as charts, diagrams static/display, posters, pictures and photographs.

All the 20 respondents indicated that students were taught to use the following techniques; drawing, printing, splashing, spraying, tracing, painting, stamping and scratching as a means of creating the elements of design. Responses from 20 respondents indicate that colour symbolism is taught in the Colleges of Education. However, no respondent stated any specific teaching-learning material for teaching colour symbolism.

Summary of findings from the questionnaire administered to tutors in the Colleges of Education.

I. All the tutors in the selected Colleges have their first Degree in Art Education. Out of the 20 tutors sampled, 18 of them have B.Ed in Art Education while the other two have Bachelor of Fine Arts (BFA) in Art.

II. Teaching-Learning materials for practical work or course work are normally procured by the students themselves. Tutors guide students in the type of materials required for the work. The only material sometimes provided by administration for the tutors use is poster colour and paper.

III. Tutors were able to individually prepare their own teaching-learning materials necessary for some specific topics such as drawing techniques. They also provide handouts for students.

IV. Colour work is taught by tutors demonstrating how to draw the colour wheel on the chalk/white board, and students are guided through instruction to draw the colour wheels.

V. Tutors collect or gather relevant materials from the environment. However, the creation of tools and materials are left in the hands of the students but majority of them fail to keep records of this through drawing and printing.

VI. Tutors take students through the topic 'Creating the Element of Design' by just mentioning the techniques for instance drawing, sketching, spraying, splashing, sprinkling, doodling and scribbling. The students are not taken through the practical skills to create the elements.

VII. Tutors teach Ghanaian colour symbolism without using any teaching-learning materials. All the 20 tutors sampled could not mention any well designed teaching-learning materials used in teaching colour symbolism at the College of Education.

This suggests that tutors in the Colleges of Education prepare some teaching and learning materials which they use during teaching.

4.3 Interview with CRDD Resource Person

A resource person at Curriculum Research Development Division of the Ghana Education Service was interviewed on the use of the teaching syllabus for the Colleges of Education. The resource person indicated that the curriculum for the Colleges of Education was designed and revised in October, 2006. The main heading or title is Three-Year Diploma in Basic Education for Teacher Training Colleges, Vocational Skills, and Visual Art Related Teaching Syllabus.

The syllabus was designed in line with proposal of Teacher Education Division of the Ghana Education Service. According to the resource person, experts were drawn from the Universities, Teacher Education Division and Colleges of Education to draw the Teaching Syllabus. The study of Vocational Skills, Visual Arts related subject is based on the theory of learning by understanding,

not by rote learning. Practical problem solving method should be adopted in teaching. As much as possible, time should be spent on the teaching and learning of hands-on-activities. Emphasis must be placed on the acquisition and application, the thinking and reasoning skills (education of the head), psychomotor skills (educating the hand) and affective skills (educating the heart).

The resource person indicated that the CRDD did not prepare any physical materials to be distributed to the colleges as teaching-learning materials. He stated that CRDD in collaboration with the Teacher Education Division (TED) invites experts from the Art Education Universities and other experts drawn from the Colleges of Education to plan and outline some teaching-learning materials to be used alongside the teaching of Vocational Skills. The researcher try to find out whether the tutors who were going to teach the subject are well informed about the suggested teaching-learning material. The resource person stated that it was suggested to the Teacher Education Division (TED) to plan and organise workshops for all the tutors teaching Vocational Skills in the Colleges of Education on capacity building workshop in the teaching of vocational Skills.

These workshops were organised in 2004 and again in 2006. The researcher attended the said workshops on capacity building for tutors in the Colleges of Education. The four-day workshop was not fully focused on the teaching of practical activities. The resource person also indicated that it was hoped that the tutors in the Colleges of Education will fully use what they were taught at the workshop in teaching.

4.4 Testing For the Efficacy of the Instructional Materials Produced.

Trials testing of the teaching-learning materials the researcher designed and produced were carried out using two different groups of students, thus Untrained Teachers Diploma in Basic Education (UTDBE) and Diploma in Basic Education.

Trial testing with UTDBE second year student who offer Vocational Skills Visual Arts related subjects

Instructional materials were used to teach practical lessons in two different Colleges of Education. The colour wheel on primary colours of pigments (Figure 5a) and primary colours of light (Figure 5b), pictures on natural elements of design, (plate 1-6) were tried by using them to teach in separate lessons of one hour duration each. The displays on artificial or man-made elements of design (plate 7-11) were also used to teach three separate practical lesson of one hour each. The students were also guided through demonstration by the researcher to produce a work in colour.

Trial testing of instructional materials using Diploma in Basic Education (DBE) regular students

The six point colour wheel, 12 point colour wheel and a chart on colour interaction were tried out with the sampled students in teaching colour work. The researcher used one hour each to teach a practical lesson with the six point colour wheels. The students were guided to first draw the outlines of the colour wheel. This was followed with mixing and painting of the various colours in

their right proportion through trials and painting the pigments in the outline of the wheels drawn on the paper provided by the researcher for such purpose.

On the colour interaction, outlines of 5 boxes were arranged in horizontal line as in (Figure 9). This was drawn on the paper provided for the students by the researcher. The researcher treated one colour at a time. One colour was selected by the students and painted at the centre. The students were then guided to add bit-by-bit the tint (white) of the hue they have selected and paint its the next box at the left side of the hue till the complete the chart. The same thing was done to the shade.

Complements of colours were taught by displaying the 12 point colour wheel (Fig. 8) for students to view. Students were asked to identify any hue on the colour wheel. After that they were asked to identify the colour which falls exactly opposite to the colour they have identified first. The concepts of complementary colours were then explained to students as colours which fall exactly opposite to each other on a 12 point colour wheel. However, similar colours could be found on the six point colour wheels as well. The two colours lying side-by-side to a complement of a colour are its split complements. For instance, the split complement of green is the two colours lying side-by-side to red which are red-orange and red-violet.

The summary of activities, observations and reactions of students during the trail testing are listed below:

- Students were able to identify the primary colours used in the design

- Students were able to observe, compare and tell the differences between the primary colours of light and pigments.
- Students were able to observe the six point colour wheel and identify the two primary colours that are mixed to give a secondary colour.
- Students maintain a very high morale throughout the entire teaching and learning process
- The students were able to use the twelve point colour wheel to learn about colour terminologies such as intermediate, harmony, complementary and split complement of colours, analogous, triadic, contrasting, and cool and warn colours.
- Students were able to paint using brushes and postal colours.
- They were also able to mix colours freely to obtain other colours.
- Students were able to apply the knowledge on what they saw in preparing their own teaching-learning materials on colour work.
- Students were able to draw six point and 12 point colour wheel
- Students were also able to determine the split complement on a 12 point colour wheel
- It was also observed that the students participated fully during the teaching and learning session.
- The students were able to distinguish between the natural and man-made elements of design.

This suggests that students are capable of designing and constructing simple instructional materials using basic tools and materials such as poster colour, paper, manila cards, sketch pads and drawing sheets. The tools used include pencils, pair of scissors, erasers, pair of compasses and measuring rule.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENTDATIONS

5.1 Summary of main findings

The purpose of this study was to develop and produce teaching-learning materials of high aesthetic quality, durable but less expensive and above all easy to construct for use in teaching. The principal research tools used was qualitative research method which was supplementary, experimentation and descriptive design. The researcher designed and constructed teaching-learning materials on three point colour wheel on primary colours of light, primary colours of pigment, six point colour wheel, 12 point colour wheel, a chart on colour interaction, photographs on natural elements of design display and static on fabric on artificial elements of design suitable for teaching basic design in Vocational Skills, Visual Arts related subjects and tested their effectiveness with Untrained Teachers Diploma in Basic Education and Diploma in Basic Education students.

The results showed that:

1. The materials used for the design and production for the teaching/learning materials were suitable for the development of TLM are to suit aesthetic demands.
2. The media used in constructing the artefacts or teaching-learning material worked well for the researcher.
3. Designing and painting of intricate designs in a confined borders using brushes and other painting tools is both time consuming and difficult for newly admitted students in the Colleges of Education who offer Visual Arts.

4. Students were capable of exploring or using materials and tools provided for a class freely to make simple marks and designs.
5. Students were able to use their brushes to mix and paint the colour wheel freely using poster colours on sketch pad, paper, drawing sheets and drawing books.
6. Students were excited in the class and worked throughout the entire period of interaction.
7. The theory developed from the research indicates that the use of appropriate teaching-learning materials in the teaching and learning process brings about better understanding of concepts that is “seeing and practice leads to remembrance and recall of facts which facilitate better understanding of concepts”.

5.2 Conclusions

1. The research proved that the type of material used for Vocational Skills, Visual Arts related subjects are poster colours, paper, crayon, colour pencil, pastel, sudee and tools include brushes, pencils, straws and set of compass, protractor and rule.

2. The research reveals that most Visual Arts tutors in the Colleges of Education use demonstration techniques of teaching. They use illustrations and sketches on the chalk/white boards to drive home their teaching objectives. The learners are therefore encouraged to practise the skill demonstrated by the tutor on their own.

3. It was observed that teacher-trainees in the teacher colleges of education provide most of the materials and tools needed for the course work in Vocational Skills on their own.

4. The research reveals that teacher-trainees provide their own teaching-learning material for their practical course work. They do not receive adequate material for practical art work from the College Administration.

5.3 Recommendations

Based on the above conclusions, the following implications are drawn from the project for which some policy directions are suggested.

1. The Ghana Education Service should ensure that, the role of acquisition of vocational skills, the introduction of Creative Arts and Technology at the basic schools and Visual Arts in the junior high school in the New Educational Reform should be vigorously pursued to enable young people acquire relevant and marketable skills in order to increase national productivity. When pupils acquire simple design skills they can be helpful to others who lack them to improve and increase creativity. They can be productive in the field of Visual Arts as well as other fields of the educational endeavour.

2. The government of Ghana's policy on study leave with pay should be reviewed to cover tutors in the teacher colleges of education who are pursuing the MASTERS and M. PHIL degrees in the various tertiary institution especially those offering Art Education. This will help them broaden their knowledge and competency to address the problem faced by teachers in the basic schools in design and construction of teaching – learning materials this will enhance effective learning.

3. The Teacher Education Division (TED) of Ghana Education Service (GES) should consider reintroduction of "Teaching Learning materials" as a course to be pursued by all teacher trainees in

the Colleges of Education. This will equip trainees with basic skills in all the subject areas on how to design, construct and use relevant tools and materials which are cheaply and abundance in their environment to improve upon teaching and learning situations in basic schools. The teaching of Visual Arts related subjects should be included in the Two-Year Diploma in Basic Education for Certificated Teachers (SANDWICH) programs. This will help them to teach the newly introduce Creative Arts and Technology Visual Arts in the basic schools.

4. The Curriculum Research Development Division of GES/MOE should organize meaningful programmes and workshops should be organized for tutors in the Teacher Colleges of Education and other visual artists who will intend help in educating the basic school teachers on how to produce and use simple teaching learning materials.

5. All over Ghana Visual Arts related subjects and for that matter vocational skill in the Teacher Colleges of Education is suffering from low reputation. Besides, the younger generation is not willing to get involved because of misconception and low returns. But Visual Arts is loaded with economic and aesthetics values. Its primary purpose of fostering creativity in the individual must not be lost. Visual Artists and Art Educators should corporate to save and redeem the image of vocational skills in schools. Research into appropriate yet simple techniques in designing and producing teaching learning materials should be explored and shared with other Visual Artists. Most of the students' in Colleges of Education are more than ready to work with visual artists who are willing to help and guide them.

Implication for further research

It is suggested that other researchers try to find ways of improving upon teaching techniques or methods in vocational skills Visual Arts related subjects. This will bring about improvement in the teaching and learning of vocational skills Visual Arts related subjects.

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APPENDIX A

QUESTIONNAIRE FOR TEACHER – TRAINEES OFFERING VOCATIONAL SKILLS VISUAL ART RELATED SUBJECTS.

Dear student, this questionnaire seeks to find out whether teaching - learning materials are used in teaching pre–vocational skills (fundamentals in visual art related subject in your college. Please you are kindly requested to respond to the following questions. Everyinformation given will be treatedas confidential.

SECTION A

Please tick [√] the appropriate respond below.

1. Name of College……

2. Gender: Male [ ] Female [ ]

SECTION B

Please tick [√] the appropriate response.

1. Does your tutor use teaching-Learning materials in teaching vocational skills, Visual Arts related subjects Yes [ ] No [ ]

b. If yes what type of TLM do they use?

Visual materials

a) Three –Dimensional objects [ ] Models [ ] Specimen [ ]

b) Prints: Textbooks [ ] Workbooks [ ] Programmed materials [ ] Handouts [ ]

c) Chalkboards [ ] Flannel or felt boards [ ] Bulleting Boards [ ]

d) Still Pictures: Long projectors photographs [ ] Illustrations [ ] Projected slides [ ]

Film strides [ ] Overhead projectors and transparencies [ ] Opaque projectors [ ]

e) Graphics: Charts [ ] Diagrams [ ] Graphs [ ] Mats and Globes [ ] Posters [ ]

Audio Aids

a) Radio [ ]

b) Record player[ ]

c) Tape recorders[ ]

Audio- Visual Aids

a) Motion pictures [ ]

b) Television[ ]

c) Audio Conferencing [ ]

d) Computer Conferencing [ ]

e) Video [ ]

Community Resource

a) Community experts [ ] Libraries [ ] Museum and Monuments [ ] Chiefs' palace [ ]

Exhibitions [ ] Festivals [ ] Cultural Shows [ ] Durbars [ ] Drama Groups [ ]

Asafo Companies [ ]

Customary Rites [ ] Parent Teacher Associations (PTA) [ ] Churches [ ]

Any other TLM: List them

……

2. Does the Administration (Principal) provide Art materials for individual students use?

Yes [ ] No [ ]

3. Do Art Tutors provide Teaching – learning materials for you when teaching?

Yes [ ] No [ ]

4. Have you been preparing TLM on your own?

Yes [ ] No [ ]

If yes What type of TLM do you prepare?.....

4 b List three materials used in preparing the TLMs mentioned above.

……..

4 c. List three tools or equipments used in preparing the TLMs

……..

5. Who provide you with ink/colour for colourwork?

a. Administration [ ]

b. Tutors [ ]

c. Students themselves [ ]

6. Have you learnt about colour wheel?

Yes [ ] No [ ]

7. What materials do you use in preparing colourwheel?

- Paper [ ]
- Poster colour [ ]

- ❖ Card board [ ]
- ❖ Acrylic paint [ ]
- ❖ Plywood [ ]
- ❖ Cartridges paper [ ]
- ❖ Bond paper [ ]
- ❖ Manila cards [ ]
- ❖ Sketch pads [ ]
- ❖ Drawing sheets [ ]
- ❖ Brown Paper [ ]
- ❖ Fabric [ ]

8. Do tutors bring already prepared colour wheel to class to teach colourwork?

Yes [ ] No [ ]

9. List the materials provided by the college for vocational skills, Visual Arts related subjects.

……..

10. Have you learnt about basic design? Yes [ ] No [ ]

11. If yes,

i. List five elements of design …….. …….. ……. …… …….

ii. List five principles of design ……. ……. …… …… ……

iii. State one means of creating an element of design.

……..

APPENDIX B

QUESTIONNAIRE FOR TUTORS TEACHING VOCATIONAL SKILLS VISUAL ART RELATED SUBJECTS IN THE TEACHER COLLEGES OF EDUCATION

Dear tutors, this questionnaire seeks to find out whether teaching materials are used in teaching pre – vocational skills (fundamentals in visual art related subject in your college. Please you are kindly requested to respond to the following questions. Every information given will be treated as confidential.

SECTION A

Name of College: ……

Gender …… Male [ ] Female [ ]

Highest qualification ……..

Areas of Specialization in Visual Arts

……..

SECTION B

Please tick [√] **where appropriate**

1. Do you use Teaching – Learning materials in teaching?

   Yes [ ] No [ ]

2. Who supplies teaching – learning materials to your College?

   Principal [ ] Students [ ] Tutors [ ]

3. Who supplies colour/ink for colourwork?

   Tutor [ ] Administration [ ] Student [ ]

4. What type of colours do you use for colourwork? List them.

   ……

5. List the teaching – learning materials you use for teaching colourwork

   ……

6. Do you use already prepared chart for colour wheel to teach about colourwork?

   Yes [ ] No [ ]

7. How do you teach colourwork?

   a) By using a chart for colour wheel Yes [ ] No [ ]

b) By demonstrating how to draw the colour wheel on the chalk/white board

Yes [ ] No [ ]

c) By guiding students through instruction to draw Yes [ ] No [ ]

Please tick [√] the appropriate response(s)

8. How do you acquire teaching-learning materials for the course work?

- Collect relevant materials from the environment Yes [ ] No [ ]
- Draw them for students Yes [ ] No [ ]
- Demonstrate how to make them through drawing on the chalk board in the classroom Yes [ ] No [ ]
- Ask students to draw them Yes [ ] No [ ]
- Administration provides funds to purchase them Yes [ ] No [ ]
- NGO's support by providing funds Yes [ ] No [ ]
- Students are asked to provide their own materials Yes [ ] No [ ]
- The resource centre in the College provide them Yes [ ] No [ ]

9 State any other means of acquiring TLMs for the course work

……..

10. Do you teach exploration of tools and materials? Yes [ ] No [ ]

11. How do you teach exploration of tools and materials

……..

12. What TLMs do you use to teach exploration of tools and materials

……..

13. How do you teach students to create the elements of design?

……..

14. Do you teach Ghanaian Concept of colour symbolism? Yes [ ] No [ ]

15. What TLMs do you use to teach colour symbolism?

……..