

**DESIGN AND PRODUCTION OF GARMENTS AND ACCESSORIES USING
MACRAMÉ TECHNIQUE AND LOCALLY AVAILABLE YARNS**

KNUST
BY

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DEDICATION

This book is dedicated to Adane Tachie Mary, Gyabaah Tachie Ephraim, and Adjei Tachie Peter as well as Ms. Anna Akosua Ayiwa and Mr. Abisah Emmanuel Kwasi.



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ABSTRACT

This thesis sought to produce garments from macramé other than the use of existing clothing construction methods. The fashion trend is dynamic and as such people's preference for a variety in garments keep revolving. The study explored the various methods of clothing production as means of responding to consumers fashion needs in the contemporary fashion market. The research explored different types of yarns especially those which could be used for macramé and made selection of appropriate yarns for the production of macramé garments and accessories. The study used studio-based research, since it involved manipulation of yarns for various patterns that became possible for the production of the garments. Various stakeholders in the macramé products and production whose opinions were sought included macramé artists in KNUST, sellers of macramé products in Kumasi market and people who use different kinds of yarns at their work places in Kumasi. Variety of yarns were used, these include pure cotton, cotton-polyester yarn, and others. In all, four garments were made: two skirts, two blouses, two straight dresses, four dressing bags, a purse and two sandals and two slippers. The resulting garments and accessories were given to people to wear to ascertain their wearability and for other people to pass their comments. Comments such as Christmas wear, birthday wear by observers proved the acceptability of the garments and the accessories. The researcher recommends that other researchers should try macramé garment with available local yarns for men's garment, certain types of yarns should be considered when choosing knots for garment production, also yarns used should be extra-long to avoid shortage.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Clothing is one of the basic necessities in the life of man. Many different methods have been employed in the production of garments for human wear. Such methods include sewing, and crocheting. Sewing is known to be the major means of constructing garments. Parts of garments can be obtained either through pattern making or free hand cutting and the parts are joined together either by hand or machine. There are many techniques used in the field of textiles and fashion. From the researcher's observation, other technique such as patching and gluing are used to produce garments especially women's wear currently. Garments produced by macramé are yet to be identified.

Knotter (2012) confirms the observation made by the researcher that macramé technique has been used to produce items such as chair backs, wall hangings, lamp shades, bags, belts and foot wear other than garment. Susan (2011) adds that the common materials used in macramé are cords. It is said that the predominant use of micromacramé is in jewellery that is, bracelets, earrings, necklaces, rings, anklets among others (Knotter, 2012).

From the foregoing, and deducing from the researcher's observation that, no garment has been produced through macramé technique, is true. Ideally, the traditional process of garment production is by sewing, crocheting, but not macramé. The, researcher therefore wishes to explore the macramé technique for garment production. The macramé technique employs the art of knotting yarns to produce beautiful items. The knots are stout, tough and hard to break. With such strong art work, the product can withstand constant

laundry and regular wear. Owing to artistic twist that it incorporates, the resulting product looks interesting too (Beinecks, 2012).

The materials used for the construction of garments using the known techniques for garment production come in either natural or man-made forms (Nazrul, 2010). The natural materials originate from cellulosic, animal and mineral sources, the man-made materials are mostly synthetic or semi synthetic. The researcher has observed that, macramé garments are not available in Ghana. Also the types of yarns used in loom weaving are not used in producing macramé items. Susan (2012) explains that, “three most popular cords used in macramé are jute, hemp and nylon (polypropylene)”. Harman (2010) also used leather and nylon cords to produce wall hangings. Considering Knotter (2012), shoelace, elastic cord, and technical braid can also be used for making knots.

Having found out that macramé has been used for making wall hangings, flower pot holders, lamp shades, earrings, bangles and other interior and exterior furnishing other than garment, and the fact that macramé items are strong and interesting, the researcher finds that, it will be ideal for quality garment production, hence the choice of this project.

1.2 Statement of the Problem

Current fashion changes are not only intrinsic but also influenced by the dynamism of globalization. Thus most fashion consumers shop around for the best deal on price, quality, convenience, peer group influence and aesthetic qualities (Honest & Bruce, 2001). It has been identified that the products made from macramé technique are very strong, interesting and have unique aesthetic qualities (Hunzikor, 2012). Despite these qualities, Ghanaians have failed to use garments produced from the macramé technique.

The researcher has observed that the most common items that are from macramé are necklaces, amulets, belts, lamp shades, bangles and items for interior decorations. Garment production has been totally missing. The researcher has therefore decided to investigate, design and produce garments and accessories using macramé technique from available local yarns for Ghanaian youth, specifically females.

1.3 Objectives of the Study

The following are the objectives of the study:

- To identify the types of yarns found in Kumasi and Sunyani locality.
- To manipulate available local yarns with macramé technique.
- To design and produce garments and accessories using macramé technique.

1.4 Research Questions

- What are the types of yarns found in Kumasi and Sunyani locality?
- How feasible can the local yarns be used in macramé technique?
- Can macramé technique be used to produce garments?

1.5 Definition of Terms

Macramé – it is the art of using knots to produce useful items.

Accessories- items which are used to contribute, in a secondary manner, to the wearer's outfit.

Garment – a textile product worn on the body.

1.6 Delimitation

This study will explore Kente weaving yarns, wool, and pure cotton yarns within Kumasi and Sunyani markets to see how feasible they would be for the production of garments and

accessories using macramé technique. Emphasis will be on yarns that are available in our local market for example Kumasi Market and that of Sunyani. Concerning garment, there are a lot of them but the researcher decided to work on ladies dresses made up of two skirts and blouses, and two straight dresses.

There are a lot of accessories that can be used as complements to what we wear as garments. For the sake of this study, the researcher has delimited herself to the production of ladies dressing bag, purse, and foot wear as far as accessories are concerned.

1.7 Importance of the Study

- The project intends to add new ideas to macramé production.
- It will also broaden the scope of the fashion industry in Ghana by adding a new trend to the fashion industry and garment production.
- The project will create Commercial Avenue or an economic venture for the researcher and other people who will follow the researcher's production process.

1.8Arrangement of the Rest of Text

The study comprises five chapters. Chapter one gives the background of the study, problem statement, objectives, research questions, and significance of the study and other introductory parts of the study. Chapter Two outlined review of related literature of the study; Chapter Three talks about the research design and research tools while Chapter Four touches on materials and methods used in the study including general production procedures of the garments and accessories. Chapter Five details the summary of the study, conclusions and recommendations of the study.

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CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Overview

The scope of the review of related literature is discrete in the following categories: concept of garment design and production which entails the meaning of garment, functions of garment and garment construction methods; macramé technique embodied with meaning and history of macramé, materials used for making macramé, types of macramé knots and Macramé products; types of yarns and fibres, types of accessories and how they are used.

2.1 The concepts of Garment design and Production

2.1.1 Meaning of garment

According to Collins (2012) a garment is any article of clothing or an outer covering or outward appearance. The Thesaurus (2013) synonymously defines garment as clothing. Harding *et al.* (2012) define cloth as fibre and textile material worn on the body. The wearing of clothing is mostly restricted to human beings and is a feature of nearly all human societies.

Based on the definitions given above, the researcher explains garment as any outer covering put on the body. It is usually worn to cover the upper and lower torso of the human body. Beside this, there are different body coverings (garments) used for specific reasons. Garments came to being when our forefathers decided to cover their nakedness roughly 83,000 to 170,000 years ago (Dagg and Harding, 2012). The amount and type of clothing worn is dependent on physical stature, gender, as well as social and geographic considerations.

Physically, clothing serves various purposes that include protection for the body. It can enhance safety during hazardous activities such as hiking and cooking. It protects the wearer from rough surfaces, insect bites, rash-causing plants, splinters, thorns and prickles by providing a barrier between the skin and the environment. Clothes can insulate the body against cold or hot weather conditions. Further, they can provide a hygienic barrier, keeping infectious and toxic materials away from the body. Clothing also provides protection from harmful UV radiation (Clothing, 2009). Dagg and Harding (2012) state that clothes can be made out of fibre plants such as cotton, plastics such as polyester, or animal skin and hair such as wool.

There is no easy way to determine when clothing was first developed, but some information has been inferred by studying lice. The body louse specifically lives in clothing and diverged from head lice about 170,000 years ago, suggesting that clothing existed at that time (Choi, 2011). Another theory is that modern humans are the only survivors of several species of primates who may have worn clothes and that clothing may have been used as long as 650 thousand years ago. Other louse-based estimates put the introduction of clothing at around 42,000–72,000 BP (Reed, 2007).

According to archaeologists and anthropologists, the earliest clothing likely consisted of fur, leather, leaves, or grass that were draped, wrapped, or tied around the body. Knowledge of such clothing remains inferential, since clothing materials deteriorate quickly compared to stone, bone, shell and metal artifacts. Archeologists have identified very early sewing needles of bone and ivory from about 30,000 BC, found near Kostenki, Russia in 1988. Dyed flax fibres that could have been used in clothing have been found in a prehistoric

cave in the Republic of Georgia that date back to 36,000 BP (Balter, 2009; Kvavadze *et al.*, 2009).

Scientists are still debating when people started wearing clothes. Ralf Kittler, Manfred Kayser and Mark Stoneking, anthropologists at the Max Planck Institute for Evolutionary Anthropology, have conducted a genetic analysis of human body lice that suggests clothing originated quite recently, around 107,000 years ago. Body lice are an indicator of clothes-wearing, since most humans have sparse body hair, and lice thus require human clothing to survive. Their research suggests the invention of clothing may have coincided with the northward migration of modern *Homo sapiens* away from the warm climate of Africa, thought to have begun between 50,000 and 100,000 years ago. However, a second group of researchers using similar genetic methods estimate that clothing originated around 540,000 years ago (Reed *et al.*, 2004). For now, the date of the origin of clothing remains unresolved.

From the researcher's opinion, the usage of garment on the human body started long ago by the use of animal hides and other introductions came into being as a result of man's insatiable need for comfort in their garment. The putting on of garment provides comfort to the wearer. Garments are mostly primarily worn for protection but are sometimes used for other reasons or many different activities/purposes like beatification, sports, as well as religious purposes.

2.1.2 Garment Construction Methods

There are diverse ways by which garments can be constructed, among them are:

Crocheting The construction is made by interlocking as in knitting but here only one hook or needle is used (Modest, Iren & Doreen 2014). Sackey (2002) confirms that

crocheting can be considered as knitting in its simplest form and that only one needle with a hook at the end is used in this method of garment construction. A chain of loops is made from a single yarn that is interloped to form the fabric (Modest *et al*2014). The origin of crocheting is uncertain, perhaps has been practiced by some French nuns long ago and became popular in somewhere 1820 (Sackey, 2002).

Sewing: it is the craft of fastening or attaching objects using stitches made with a needle and thread. Sewing is one of the oldest of the textile arts, arising in the Palaeolithic era. Before the invention of spinning yarn or weaving fabric, archaeologists believe Stone Age people across Europe and Asia sewed fur and skin clothing using bone, antler or ivory needles and "thread" made of various animal body parts including sinew, catgut, and vein (Anawalt, 2007). Basically, there are two types of sewing namely hand and machine sewing. The hand sewing makes use of needle and thread used to sew with the hand while machine sewing makes use of machine for stitching.

Procedure for garment production

Textile Learner (2012) and Garment-Manufacturing (2015) gave the procedure for garment production as follows:

Design/Sketch:

In garment manufacturing, the first step is designing the sketch for the dresses that have to be prepared. For this purpose the designer first draws several rough sketches in sketch book. The designer does not go for details at this moment but allows creativity to flow on the paper through variety of sketches.

Pattern Design:

The pattern maker now develops the first pattern for the designs in any one standard size. This is made by pattern drafting method and the purpose of making this pattern is to create the sample garment for test fit.

Sample Making:

The first patterns are sent to the sewing unit for assembling them into garment. This is usually stitched on calico or muslin which is an inferior quality of fabric to reduce cost. This sample is constructed to analyse the pattern fit and design too. After the sample garment is stitched it is reviewed by a panel of designers, pattern makers and sewing specialists. If any changes have to be made they are made at this time. .

Production Pattern:

The pattern design is now taken for creating the production patterns. The production pattern is one which will be used for huge production of garments. The pattern maker makes the patterns on standard pattern making paper. These papers are made-up of various grades.

Grading:

The purpose of grading is to create patterns in different standard sizes. Grading a pattern is really scaling a pattern up or down in order to adjust it for multiple sizes. Pattern sizes can be large, medium and small or else there are standard patterns of size for different figure and stature sizes. This is generally how the following sizes S - small, M - medium, L - large, XL – extra-large, XXL – extra - extra – large are obtained.

Marker Making:

The measuring department determines the fabric yardage needed for each style and size of garment. Markers, made in accordance to the patterns are attached to the fabric with the

help of adhesive stripping or staples. Markers are laid in such a way that minimum possible fabric gets wasted during the cutting operation. After marking the garment manufacturer will get the idea of how much fabric he/she has to order in advance for the construction of garments.

Spreading:

With the help of spreading machines, fabric is stacked on one another in reaches or layers that may go over 100 ft. (30.5 m) long and hundreds of plies (fabric pieces) thick.

Cutting:

The fabric is then cut with the help of cloth cutting machines suitable for the type of the cloth. These can be band cutters having similar work method like that of band saws; cutters having rotary blades; machines having reciprocal blades which saw up and down; die clickers similar to die or punch press; or computerized machines that use either blades or laser beams to cut the fabric in desired shapes.

Sorting/Bundling:

The sorter sorts the patterns according to size and design and makes bundles of them.

This step requires much precision because making bundles of mismatched patterns can create severe problems. On each bundle there are specifications of the style size and the marker too is attached with it.

Sewing/Assembling:

The sorted bundles of fabrics are now ready to be stitched. There are what is called sewing stations for sewing different parts of the cut pieces. In this workplace, there are many operators who perform a single operation. One operator may make only straight seams,

while another may make sleeve insets etc. while another operator joins all parts to form a complete garment.

Inspection:

The garment is inspected to find out if there is excess yarn or if certain parts of the garment were not sewn, after which finishing is done by ironing or pressing.

2.3 Patternmaking

The researcher cannot ignore the review of pattern making since garments are constructed from patterns. Pattern making is the art of designing the outline of the plan or arrangement for sewing a cloth. It is considered as the basic in sewing garment. Thomas (2009) posits that the first step in pattern making for sewing garment is taking of body measurements. Thomas recommends that when taking measurements for pattern making, the person should just wear normal underclothes, and if a lady, normal pantyhose and normal bra. Steele (2008) notes that a system of sizes and patterns made it possible to fit the body, especially the male body, without resorting to custom-made clothing. Varney (1980) also indicates that patterns are needed in dress-making in order “to obtain a better fit and to save material”. Aldrich (2006) justifies the use of block patterns in the clothing industry because the blocks are constructed to standard (average) measurements for specific groups of people but could also be drafted to fit an individual figure using personal measurements. Pattern making involves the design and creation of templates from which clothing and craft items can be sewn. Patterns are made of pieces of paper shapes that are traced onto the fabric to be cut, with each individual pattern piece serving as a form for an individual part of the garment or item to be sewn. Pattern making can be done at home by more

experienced sewers, or pre-made patterns can be purchased for home sewing projects (WiseGeek, 2015).

A common way to make a pattern at home is to replicate a garment that one already owns. For example, if one has a particular clothing item that is worn out or aging and a replacement is desired, a pattern can be cut from that garment. This often involves taking apart the garment by ripping out the seams and dismantling the item into individual pieces (WiseGeek, 2015).

The researcher is of the view that if the garment is not for commercial purpose, one does not need to go through the whole process but through design/sketches to pattern, cutting, sewing and inspection to ironing can make a complete garment.

2.3.1 Methods of Pattern Drafting

Hollen (1972) advocates three methods of pattern making, namely: Flat-Pattern, Draping and Drafting.

2.3.1.1 Flat-Pattern drafting: according to Semptress (2010) “is the art of taking a set of measurements, a sheet of paper, and a pen, and coming away with a pattern”. Flat pattern is based on commercialized basic patterns with standard measurements but when employed in designing, one makes use of fitting darts to increase garment fitting.

Flat Pattern has several advantages which include the ability to design patterns to fit into economical fabric layouts, the possibility of restyling old patterns and out-of-date clothing into new ones, the ease for determining causes of mistakes and how to correct them, and flexible planning for new procedures and efficient organization of work (Hollen, 1972).

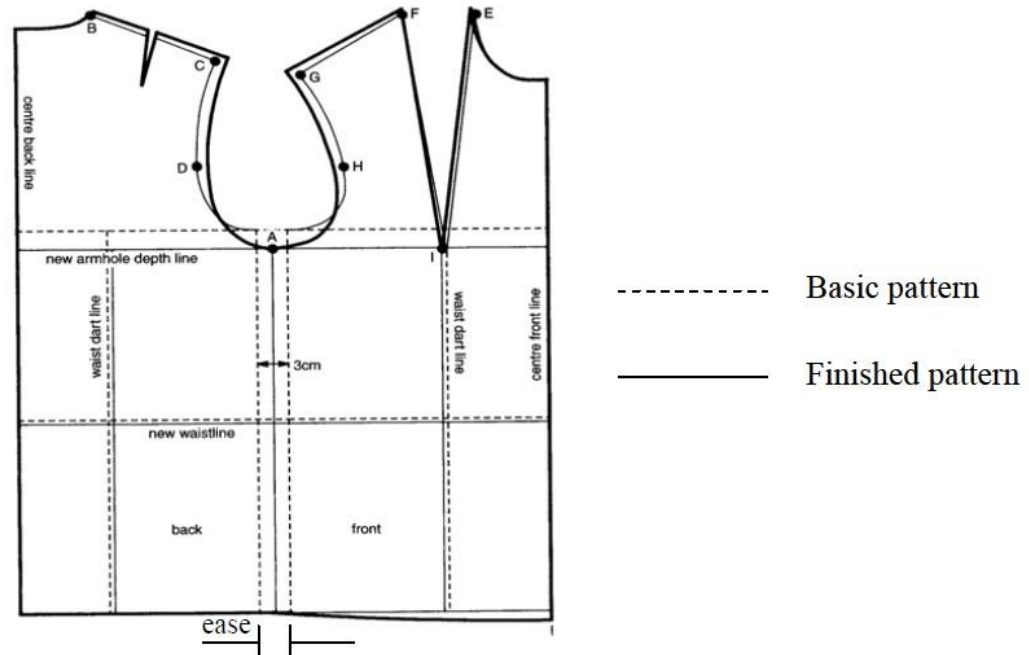


Fig. 1: Conventional Flat pattern design method

(Aldrich, 1994)

2.3.1.2 Draping is an artistic approach in which the person makes a pattern by fitting a large rectangle of woven cloth around the body so that the folds in the fabric produce the dress pattern according to the curves of the body. Vulker and Cooper (1987) suggest that draping originated from the Greeks and the Romans. The Greeks called their draped garment a chiton whose shape was achieved by draping, girdles and pinning after which embroidery was applied. The Romans had different names for draped garments for males and females. The male garment was called “Tunica” while the female draped dress was called “Stola”. Vulker and Cooper (1987) state that draping required little technical skill, as no patterns or sewing were required, hence, draped garments began to be replaced by clothing cut to a pattern. However, anybody who wishes to embark on large scale garment production by draping approach to patternmaking could do so through line-for-line copy of already sewn garment. Draping is 3D pattern design technique. It directly implements the

pattern design upon the human body or mannequin. According to Wang (2007), this method is being considered as the best for achieving the required silhouette and fitting because it provides the advantage of “what you see is what you get”.

2.3.1.3 Drafting is a scientific process of pattern designing that is based on a set of body measurements. Therefore, taking accurate measurements is the foundation of creativity in pattern making. Okorie (2000) regards creativity and knowledge of measurements as imperative characteristics of garment designers. Draft patterns usually rely on basic pattern as foundation or master pattern. The basic pattern for men’s wear (shirt and trouser) consists of several measurements to achieve custom fit (Musheno, 1980). Anikweze (2012) opines that, for shirt patterns, the needed measurements consist of neck, neckband, shoulder, chest, centre front length, centre back, back width, waist, arm length, arm circumference, and sleeve length. For trousers, the required measurements are the waist, seat (hip), high hip, thigh, knee, out-seam (side lengths), inseam, and hemline.

Drafting refers to the direct drawing of patterns on the paper using a construction formulae based on linear measurements, such as length, girth, etc. (also known as pattern construction procedure). Direct drafting is a popular method for the industrial pattern makers, because they need the most efficient way to produce pattern for mass production (Wang, 2007).

From the researcher’s point of view, flat pattern is meant for mass production which usually uses standardized size. It is used for the production of ready-made or ready-to-wear garments as stated earlier. Draping is done on the model or mannequin with the fabric. It does not make use of paper but fabric usually a fine plain fabric like muslin is used to wrap the model aiming at obtaining a garment to fit well on the consumer. Drafting may be defined as a system of drawing patterns on paper with mechanical precision on the basis of

body measurements. This is an effective and economical method which can be learned easily unlike draping which requires a model, a lot of fabric and considerable skill. Draping and drafting are usually custom-made, hence, time-consuming unlike flat pattern. Examples of already patterned pieces are in (Fig. 2)

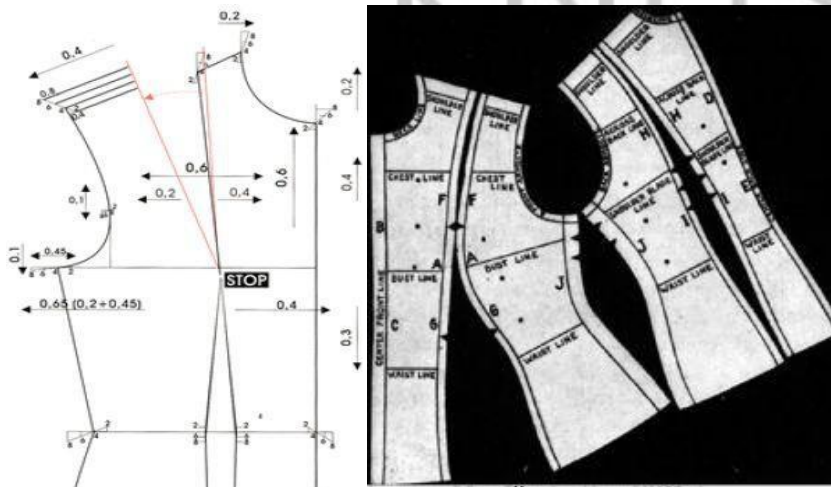


Fig. 2: Patterned pieces of garment

Source: Hub Pages (2015)

2.4 Functions of Garment

Garment, which is made from textiles, is one of the three basic necessities of man, alongside food and shelter (Adu-Akwaboa, 2010). Although, garment (clothing) is usually prioritized second to food, Agyemang (2001) posits that one can go unnoticed without food or shelter for a moment, but without clothing, he or she may be perceived in a civilized world as insane or a mad person. All items used in covering and ornamenting the body which is found in body arts can be termed as fashion.

In countries where it is either very warm or very cold most of the time, the same form of garment is worn year after year. Where the temperature is constantly changing, as in the temperate zone, the style of clothing is also subject to frequent change; and these varying modes constitute what is called "fashion."

While the primary use of clothes is to afford protection from the heat and cold, they should be made and worn with a view to pleasing the eye. It is essential, therefore, that they be carefully cut and neatly made, and they should be kept clean and in good order. Clothing performs a range of social and cultural functions, such as individual, occupational and sexual differentiation, and social status. In many societies, norms about clothing reflect standards of modesty, religion, gender, and social status. Clothing may also function as a form of adornment and an expression of personal taste or style. Elise (1998) also states that fashion exists as a means of creating an outward appearance that reflects something about the individual, whether it is identification with a cultural movement such as punk rock, economic status such as a wealthy businessman.

Clothing can and has in history been made from a very wide variety of materials. Materials have ranged from leather and furs, to woven materials, to elaborate and exotic natural and synthetic fabrics. Not all body coverings are regarded as clothing. An object or device not essential in itself but adding to the beauty, convenience, or effectiveness of something else can be an accessory. Examples of fashion accessories include scarves, handkerchiefs, bracelets, and rings.

Humans have shown extreme inventiveness in devising clothing solutions to environmental hazards. Examples include: space suits, air conditioned clothing, armor, diving suits, swimsuits, bee-keeper gear, motorcycle leathers, high-visibility clothing, and other pieces of protective clothing. Meanwhile, the distinction between clothing and protective equipment is not always clear-cut since clothes designed to be fashionable often have protective value and clothes designed for function often consider fashion in their design. Wearing clothes also has social implications. They cover parts of the body that

social norms require to be covered, act as a form of adornment, and serve other social purposes (Flugel, 1976).

A lot have been said in relation to the functions of garments. The researcher deems it very imperative for one to wear garment to primarily protect or secure him/her from environmental conditions especially at workplaces. Human without garment is considered as lunatic in this current age. Aside protection, garment is used for other purposes in our societies such as body adornment etc. Fundamentally, man without garment is considered to be uncivilized in the society and loses dignity as human.

2.5 Meaning and History of Macramé

Macramé is the art and craft of decorative knotting (WiseGeek, 2015). Macramé comes from a 13th Century arabic weavers' word "migrah" meaning "Fringe" This refers to the decorative fringes on camels and horses which help, amongst other things, to keep the flies off in the hot desert regions of northern Africa (Knotter, 2012). Most everyday knots can be traced back to sailors entertaining themselves with extra rope during long months at sea. A half-knot is the first thing you do in tying a shoelace. A square knot is what most people think of when they hear "knot," two half-knots in opposite directions. A double half-hitch, a variation on a square knot, is where one string bears the knot and the other string wraps around it. An overhand knot is accomplished with just one string, where you make a looped knot onto itself. Once you have mastered these types of knots, you can investigate more complicated ones or just make up your own!

It is normally used in decorative weaving, for instance wall hangings, and was a common fixture in the 1970s (WiseGeek, 2015). According to (WiseGeek, 2015), Macramé is an art of decorative knotting without using needles or hooks. By using a series of knots,

many ornamental patterns are created. Macramé can be created using any kind of suitable material. One can use fine thread to make macramé lace or even use leather strips. By a special technique, the macramé craft keeps the knots in place while the work is being done. Macramé can be tried by anyone with a passion to create with little or no experience.

Beinecks (2010) states that macramé consists entirely of knots which require stout, tough thread which will not break in the working. Such thread will naturally have a strong twist to be in consequence well rounded. The history of macramé can be traced to the early fourteenth and fifteenth centuries when this craft was practiced in France and Italy.

Legend goes that North American sailors spent long hours aboard ships practicing macramé square knots and hitch knots. These sailors made fringes for wheels and bell covers, netting and screens. Over the years this art and craft fell to disuse. It was again revived in the sixties with the „hippie movement“, which brought with it a revival of interest in this ancient craft. Today, macramé craft has regained its immense popularity. With reference to Acajou (2008), Macramé has been around for over 1000 years, and it is once again increasing in popularity.

With respect to the definition of macramé by Knotter and other writers, macramé technique in this context can be defined by the researcher as the manner in which individual decorative knots made of normal weaving thread are combined to form a complete product. It seems to be an art that is done by anyone with passion, that is, a kid or an adult and can make macramé anywhere due to the fact that the tool for macramé is the hand and any flexible materials.

2.5.1 Materials for Making Macramé

Beinecks (2012) states that, different types of cord are used in macramé to come up with elegant and artistic items. For instance the cord which is dyed, cheap and excellent material for holding plant holders is different from the embroidery threads that are used for delicate ornamental work. Dramatics (2005) confirmed this statement by saying,

“Vary the type of cord used and you can come up with elegant and artistic items” Below are some of the materials used in macramé.

Cotton crochet: This is a simple cord type, which is soft and easy to work with. It is available in myriad colours. This works well for small and delicate work. **Embroidery**

floss: This makes uses of strong cords in a variety of colours. The knots using this cord type are strong and difficult to untie.

Hemp: This is a strong natural fabric and wears well.

Polypropylene: This is a type of cord available in various sizes. It is strong and durable.

Rattail: This type of cord lends a satin feel to the crafted object. It is available in a variety of colours and sizes.

Soutache: This is a kind of flat-ribbed satin cord often used for trimming.

Waxed linen: This is best-suited for creating crisp knots. It is slightly stiff and can hold well.

Wire: This is used in macramé jewellery. Copper is the best choice as it provides strong and durable cord.

Acajou (2008) stated that “the length of the cord is affected by the type of knots and the finished length”. The recommended measurements have to be looked into before starting any macramé project. It is better to make sure that the ends are generously measured to

avoid the risk of running out of cording during the course of the project. It becomes much better to have extra cording than face the difficulty of adding a cord in an inconvenient place in the design (Anderson *et al.*, 2008).

Macramé jewellery is often made in combination of various beads made of glass, wood, pendants or shells. Gemstones are also widely used in macramé rings. Wire is used in making necklaces. Leather and fabric is used to craft accessories like belts created using macramé techniques. Large macramé decorative pieces such as wall hanging or window coverings use wood and metal. Macramé wall hangings are made from a wide variety of material ranging from fine linen to heavy weight jute. Beads, feathers, buttons, rings and shells add a decorative touch to a fine piece of macramé work. With reference to Acajou (2008), macramé cord materials have specific qualities that one needs to become familiar with. It is vitally important to choose the right type for a project. For example, making a hammock requires strong, sturdy materials. Jewelry, on the other hand, needs a softer type of material. Nowadays, there are many kinds of cord materials available, including yarn, ribbon, leather, and parachute cord.

The researcher noted that, each and every type of material has its specific application in macramé products production. The use of a particular yarn in the production of a specific macramé product is based on the required quality end product to be made. Measurement is considered vital in macramé technique so as to acquire the needed length of yarn/material for the work to be produced rather than exhausting the material in the mid of the work.

2.5.2 Types of Macramé Knots

Many knots used in macramé craft can be traced back to sailors who entertained themselves with extra rope during long months at the sea. Some macramé knots include half knot,

square knot, double half hitch, overhand knot, larks' hard knot, Josephine knot, Chinese crown knot etc.

Half knot which is one of the macramé knots is used in tying the shoelace. A square knot is made of „two half knots in opposite direction“. A double half hitch has one string bearing the knot while the other string wraps around it. An overhand knot is created with just one string where a loop knot is made onto itself.

Once these basic types of knots are mastered, one can personally investigate more complicated knots or just make up one's own knots. In professional macramé, the primary knots are the square knot and the various forms of hitching: full hitch and double hitch.

The other common knots used in macramé are overhand and double half hitch knots. Larks' head knots are simply done by tying the yarn mounted to its anchor or starting cord.

Double half hitch knots and flat knots are considered to be the two basic knots in macramé work. Many of the macramé designs are built from the various combinations of these two knots. Diagonal double half hitch knots are used to work the cord from the opposite direction. A firmly pinned mounting strand is essential to work this knot. Before macramé is done, an object is used as an anchor. This may most commonly be a ring or horizontal bar. Though macramé is designed to stay on its anchor permanently, it is advisable to practice with a pencil. The cord can be taped to a flat surface in place of an anchor entirely but the artist is to make sure that the tape keeps the cord anchored and parallel to the surface. A connector or charm is used as anchor in making a necklace or bracelet macramé.

Larks Head Knot

In making larks head knot, a loop of cord is placed over your anchor and bent over. This is a standard way of initiating any macramé project. The length of the cords is then pulled through the loop. With reverse larks head knot, the cord is pulled from the other side. Pulling is gently done to snug the knot down, that is, the larks head knot (Plate 2.1)

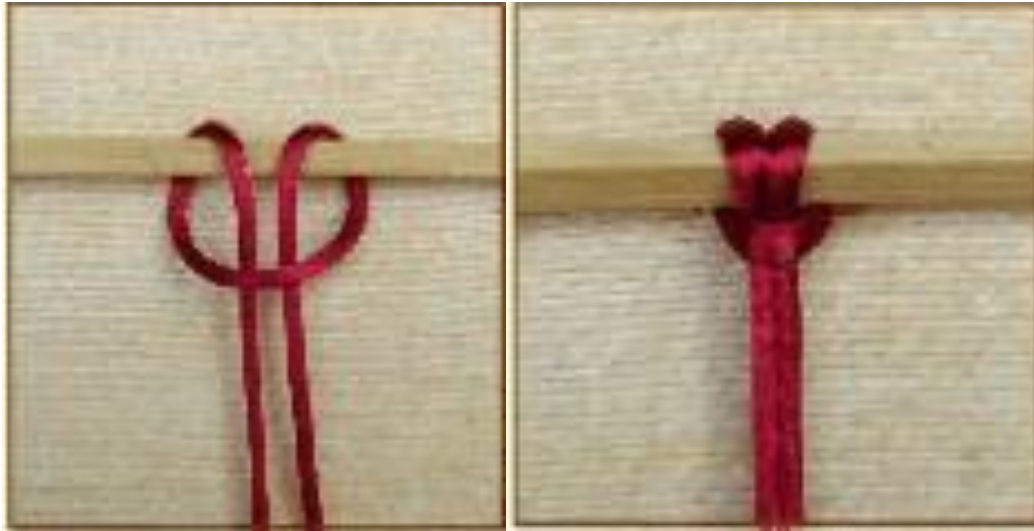


Plate2.1:Larks head knot

Source: Hoeschen, 2014

Tying a Square Knot Sennit

With this type of macramé knot, the cord is bent the right-hand over the left-hand cord or vice-versa as long as you alternate sides resulting in a square knot. This is the basic knot that is present in most macramé projects. This is the first knot learnt by one who wants to learn in macramé.

The left-hand cord up is fed over, and through the loop formed by the right-hand cord. The artist snugs the knot and then ensures that both cords are evenly pulled to keep the knot centred (Hoeschen, 2014).

A half knot is created which when repeated over, leads to a spiral weave. The left-hand cord is bent over the right-hand cord, that is, if the artist started with the right.

The right-hand cord is feed up, over, and through the loop formed by the left-hand cord. Snugging of the knot is done again. Repetition is done until the desired length of pattern is obtained. A row of knots is called a "sennit."



Plate 2.3: Half knot
Hoeschen, 2014
Hitch



Plate 2.2: Square knot sennit *Source:*
Source: Hoeschen, 2014 **Alternating Half**

A Half Hitch is tied by passing the working cord around the carrier cord and then through the loop formed. The Alternating Half Hitch switches back and forth between the two cords (Ndsu Extension Service, 2015).

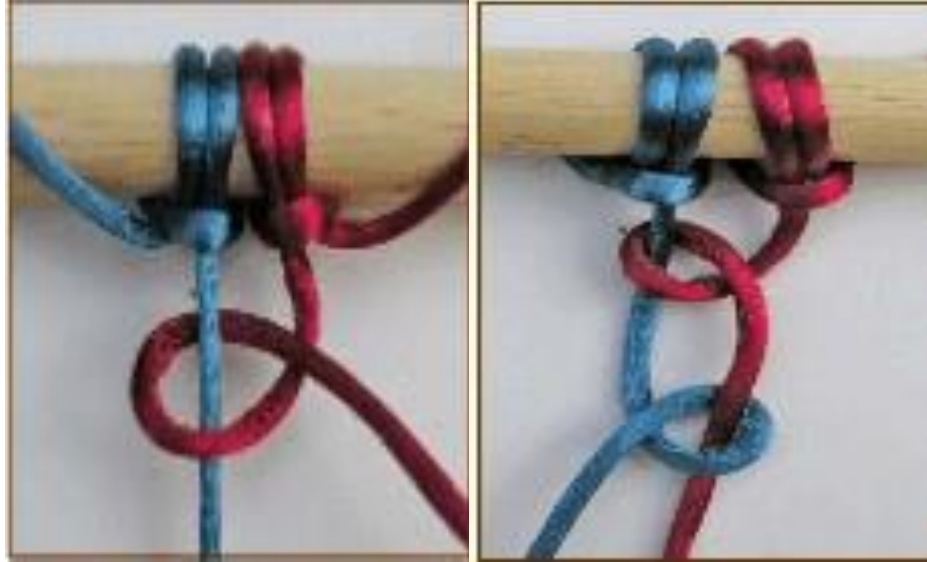


Plate 2.4: Alternating Half Hitch

Source: Hoeschen, 2014

Overhand Knot

This type of knot is the same as how tying of shoe lace is done.



Plate 2.5: Overhand knot

Source:Hoeschen, 2014

Square Knot

The square knot is the basis of many designs. It is also called“Flat Knot or Reef Knot”.

There are two ways of creating square knot.

With the first method, the left cord goes over the centre, then under the right cord.

The right cord goes under the centre, then comes up through the hole (and passes over the

left cord).The left cord goes under the centre, and over the right cord. The right cord goes over the centre and then down through the hole (and passes under the left cord).

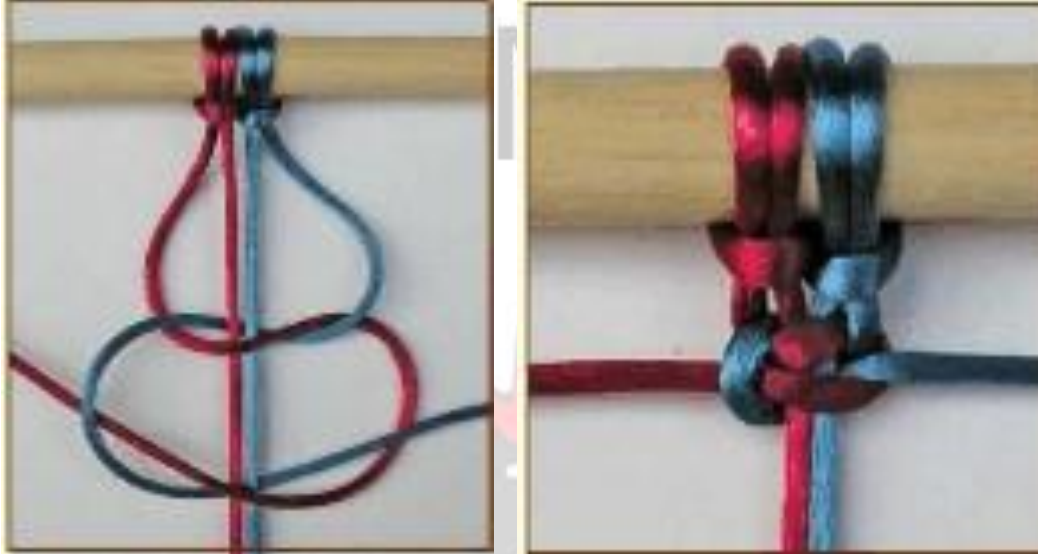


Plate 2.6: Square knot

Source: Hoeschen, 2014

Horizontal Double Half Hitch

Two half hitches are tied around the "carrier cord" carrying the knots. A pin between the first and second cords serves as a structure to pull against. It is pulled by snugging while the carrier cord is held straight out (horizontal).



Plate 2.7: A completed row of knots of Horizontal double half hitch

Source: Hoeschen, 2014

Diagonal Double Half Hitch

The Diagonal Double Half Hitch is tied in exactly the same way as the horizontal double half hitch: the carrier cord is held in a diagonal position as tying of the knots is done.



Plate 2.8: Diagonal double half hitch

Source: Hoeschen, 2014

Vertical Double Half Hitch

One important feature of vertical double half hitch is that, instead of changing the "working cord" with every knot, it is tied as in horizontal double half hitch; the vertical double half hitch uses the same cord to tie knots all the way across the row. A pin is placed between the first cord and second cord to serve as an anchor to pull against. A half hitch is tied with the first cord and around the second cord then snugly pulled. The second half hitch is tied with the first cord, around the second cord and then given a snug pull.

Using the same cord as a working cord, it is moved to the next cord in the row and the steps are repeated to tie another vertical half hitch around the new cord and then it is pulled snug. It is repeated continually until the row is complete.



Plate 2.9: Vertical double half hitch

Source: Hoeschen, 2014

Berry Knot

This knot can be used for beautiful embellishments. With berry knot, a row (sennit) is tied if square knots. A minimum of three knots is created. The centre cords is taken and passed the cords up and between the middle of the cords above the knots. It is pulled down so that the square knots curl up into a ball. These same cords are used to tie a square knot around the cords that were not pulled through the cords above the knot.



Plate 2:10 Berry knot
Source: Hoeschen, 2014

Josephine Knot

Here, two cords are used. The left cord is used to make a right facing loop. The lower part of the cord is passed behind the upper part. The cord at the right side is taken and laid across the loop made in the first step, and then passed under the lower part of the cord at the left side.

It is then brought around; over the part of cord that is laid on top of the loop and under the outside part of the loop and gently tightened, keeping the two sides even. For a double knot, a second cord is added to each side (Hoeschen, 2014). In Chinese macramé, some decorative knots are known by queer names such as 'Monkey's Fist', „Double Coin“ and „Good Luck“.



Plate 2.11: Josephine knot

Source: Hoeschen, 2014

A statement can be made based on the literature that there are different knots in macramé production. It is essential for the knots to be in place for the yarn to be smooth, firm and thereby prevent stretching. For this reason, an anchor, usually called a mount is used. This board or a spongy pad must be firm yet soft enough to hold pins. The macramé board helps keep the size of the knots even and the pattern of the design uniform. Sometimes, yarn can be tied onto the back of dining chairs, door handles, rod or ring to anchor the yarn and to hold under tension (Hoeschen, 2014).

Alternating Square Knot

Alternating Square Knot (ASK) creates a net-like pattern and is one of the most important knotting techniques known in macramé. The basic concept is that you tie Square knots in horizontal rows. In every other row you alternate the cords used to tie the knots. Be sure you know how to tie a square knot before you get started. The Alternating Square Knots are made with 8 (or more) cords secured to your work surface or board. Mentally number the cords, moving left to right. Each Square Knot (SK) is tied with four cords. In a Macramé pattern you will likely have more than 8 cords to work with. The pattern will tell you what cords to use and how many rows to tie (Acajou, 2008).



Plate2.12: Alternating square knot

Source: Hoeschen, 2014

2.5.3MacraméProducts

Macramé is a wonderful and delightful craft employed to make several useful things such as accessories from bags and hanging baskets to purely decorative objects like jewelry and wall hangings. Exquisite macramé patterns are used in plant hangers, creative arts, clothing and much more. The ornamental knots of macramé can be even used in knife handles, bottle covers and tablecloth. Nowadays one can see macramé being used to cover lampshades, in a handbag or even a fine pair of shoes. According to Cardenas (2004), macramé products include Pot hunger, wall hanging, jewellery, belt, purse and pillow top among others.

2.5.3.1 Accessories

With reference to Garment Accessories (2015) accessories are the materials other than fabric used in garment for both functional and ornamentation purposes. These may be made of metal, fabric, cross-link, polymer among others and may vary according to the end use.

Accessories are often used to complete an outfit and are chosen to specifically complement the wearer's look (Cumming, Cunnington and Cunnington, 2010).

2.5.3.2 Garment Accessories

Garment accessories are decorative items that supplement one's garment. Examples include jewellery, gloves, handbags, hats, belts, scarves, watches, sunglasses, pins, stockings, bow ties, and the like.

Garment accessories add color, style and class to an outfit, and create a certain look, but they may also have practical functions. For instance, handbags are used for carrying small necessary items like money, hats protect the face from weather elements, Many fashion accessories are produced by clothing design companies but these days, people create their own brand name by designing and making their own label of accessories (Fashion Accessories (2015).

Accessories can completely change the way you look, even when you are wearing the same garments (Hubpages, 2015).

2.5.3.3 Types of Garment Accessories

There are many articles which are used to accessorize garment on the body. These include the above stated items namely, bag, earring, hat, footwear, scarf, purse etc. Normally, garment accessories can be classified in three ways namely Garment accessories/Basic accessories, decorative accessories and finishing accessories (Textile learner, 2013).

Belts

This is a flexible band or strap, typically made of leather or heavy cloth, and worn around the waist. Belts are available in different materials, colours and widths. If you feel that you have a thick waistline, use belts that match the colour of your outfit. It is advisable for tall people to use wide belts (Belt clothing, 2011).

Handbags

The handbag or purse is a helpful and fashionable accessory, carried by women. Handbags is used to hold things like wallets In British English, the word purse may better describe a wallet than it does a handbag. They can also be used to hold keys, cell phones, tissues, business cards, and other small item (WiseGeek, 2015). Normally, the wearer makes sure that her handbag goes with the shoes she is wearing, even though they may not necessarily have to be the same colour. If the shoes and bags of the wearer have different colours or do not match with the handbag, one can make sure that the colour of the shoes is lighter than the colour of the handbag a wearer is carrying or she can also treat herself to a beautiful designer handbag (Hubpages, 2015).

A handbag, also known as purse, pocketbook or pouch in American English, is a handled medium-to-large bag that is often fashionably designed, typically used by women for holding personal items. A purse is originally referred to as a small bag for holding coins (Browning, 2006).

Scarves

Another accessory is Scarf which can be worn to keep the body warm or as a decorative item. Scarves have different designs as well as different colours, sizes and fabrics. Scarf worn, adds colour to the wearer's face. Scarves can be worn on the head,

neck, waist, hat tie, shawl ties, overhang, side loop and others. Hubpages (2015) & Smith (2015) also explained scarf as a rectangular, triangular, or long narrow piece of cloth worn around the head, neck, or shoulders for warmth or decoration.

Eye wear

Eyeglasses, sunglasses or sunshade are used for protection and for aesthetic purposes. It is imperative that, they coordinate on the face of the wearer. Eyeglasses should not be too decorative, but it should be able to fit the wearer's purpose and lifestyle. Sunglasses are used to prevent sun glares as well as fashion items (Partridge, 2006).

Footwear:

Footwear refers to the things that one wears on his/her feet such as shoes and boots (Merriam-Webster, 2015). There are different styles of footwear for men and women. It is important to ensure that the type of footwear one chooses does not dominate his/her outfits. Women shoes should go with the colour of their skirts or trousers. One can wear any type of women shoes colour that is darker than the bottom part of the garment. Men should wear shoes that blend with their belt's colour (Merriam-Webster, 2015).

Jewellery

This is from old French word "juellerie", from juellier "jeweller", from joel. Personal ornaments, such as necklaces, rings, and bracelets that are typically made from or contain jewels and precious metal (Jewellery, 2015). Some jewelleries are classic and expensive, as they do not go out of fashion. These are jewelleries that can be used to accessorize one's outfits: rings, chains, pearl necklaces, bracelets, loop earrings, circle earrings, watches and others. One can wear necklace or chain that is of medium length if

he/she wants to make his/her thick neck appear slender. To make a slender neck appear wider, round bead necklace is worn and to make a thin, long face appear wider, round earrings are worn.

Head Wear

Headgear, headwear or headdress is the name given to any element of clothing which is worn on one's head. Head wear are used to keep the head warm in cold weather and also worn to complete outfit. Example is hat. It is important to wear a hat that fits one's head size and shape. These are some of the types of head wear that one can add to his/her wardrobe: straw hats, knit ski caps, baseball caps and sport visors (Headgear, 2011).

Neckties

Neckties are made from different fabrics and they come in various designs. Some neckties are narrow, others wide and are used according to the current fashion style. Other people prefer bow ties.

Gloves

Gloves come in many styles and are used mostly to keep hands warm when it is cold. Vinyl or leather gloves are used when driving a vehicle. Some people wear gloves as fashion items.

Handkerchiefs

A small piece of linen, silk or other fabrics usually square and used especially for wiping one's nose, eyes, face, etc. is known as handkerchief (Handkerchief, 2011). A square of cotton or other finely woven material intended for wiping one's nose. Using

handkerchief to peek out of your suit's pocket can improve one's appearance depending on the occasion. Some fashion handkerchiefs have border designs, others are monogrammed.

Hosiery

According to concise oxford dictionary, hosiery is referred to as stockings, socks, and tights collectively (Hosiery, 2011). The term originated as a collective term for products of which a maker or seller is termed a hosier; and those products generically known as hose and also used for all kinds of knitted fabric; hence made by knitting methods (Spencer, 2001).

There are different types of hosiery for men and women. Men are always to wear dark colour socks for their dress; white socks are to be worn for sport activities. Women hosiery should blend with the colour of their skin and shoes. If one wants to wear lowheeled shoes, he/she has to wear thick stockings. Lighter colour of hosiery adds size to the legs. Darker colours of hosiery makes the legs appear slimmer. These are the types of hosiery: leg warmers, stockings, socks, tights, leggings. To have a good fit, wear hosiery that is stretchy.

It can be deduced from the literature that, garment as sated earlier on is not made with macramé. Even those with macramé serve as a decorative portion. Macramé is mainly used for production accessories. Garments are produced by methods like sewing either by hand or by machine and also make use of patterns unlike macramé which does not involve pattern before actual production. This then provide a basis for the study to be undertaken by the researcher to bring into being, new method of producing garment, hence, variety in garments.

2.6 Yarns

According to Marjory (1986), yarn is a continuous strand of fibre either staple or filament in a form suitable for interworking to form a fabric. Collins Dictionary (2014) opines that, yarn is a continuous twisted strand of natural or synthetic fibres, used in weaving, knitting, etc. The word “yarn” comes from Middle English, from the Old English “*gearn*”, akin to Old High German's *garn* yarn, Greek's *chordē* string, and Sanskrit's *hira* band. It also defines Yarn as a long continuous length of interlocked fibres, suitable for use in the production of textiles, sewing, crocheting, knitting, weaving, embroidery, and rope making. Yarn can be made from any number of natural or synthetic fibres. A yarn is a long continuous length of fibres that have been spun or felted together. A yarn is used to make cloths by knitting, crocheting, or weaving. Yarn can be made from any number of natural or synthetic fibres such as wool, cotton, silk or acrylic. Some yarns are made from blend of several kinds of fibres. Yarns come in many thickness or weights from fine to thick. Very fine yarn is called thread and is used in sewing and embroidery. Yarns can also be used to crochet (Wallenger and Normzan, 2004).

The textile trade defines a yarn generally as a strand of textile fibres, filaments, or material suitable for knitting, weaving or otherwise forming a textile fabric (Classification of Fibres and Yarns, 2011).

2.6.1 Natural Fibres

Natural fibres are any hair like raw material directly obtainable from an animal, vegetable or mineral source and convertible into nonwoven fabrics such as felt or paper or after spinning into yarns, into woven cloth (Natural fibre raw material, 2015). The most common plant fibre is cotton, which is typically spun into fine yarn for mechanical weaving or knitting

into cloth. The most commonly used animal fibre is wool harvested from sheep. For hand knitting and hobby knitting, thick, wool yarns are frequently used.

Other animal fibres used include alpaca, angora, mohair, llama, cashmere, and silk. More rarely, yarn may be spun from camel, yak, possum, qiviut, cat, dog, wolf, rabbit, or buffalo hair, and even turkey or ostrich feathers. Natural fibres such as these have the advantage of being slightly elastic and very breathable, while trapping a great deal of air, making for a fairly warm fabric. Also the "yarn" can be made out of the Cameron tree.

Other natural fibers that can be used for yarn include linen and cotton. These tend to be much less elastic, and retain less warmth than the animal-hair yarns, though they can be stronger in some cases. The finished product will also look rather different from the woolen yarns. Other plant fibres which can be spun include bamboo, hemp, corn, nettle, and soy fibre.

In general, natural fibres tend to require more careful handling than synthetics because they can shrink, felt, stain, shed, fade, stretch, wrinkle, or be eaten by moths more readily, unless special treatments such as mercerization or super washing are performed to strengthen, fix colour, or otherwise enhance the fibre's own properties. Protein yarns (that is, hair, silk, feathers) may also be irritating to some people, causing contact dermatitis, hives, wheezing, or other reactions. Plant fibres tend to be better tolerated by people with sensitivities to the protein yarns, and allergists may suggest using them or synthetics instead to prevent symptoms. Some people find that they can tolerate organically grown and processed versions of protein fibres, possibly because organic processing standards preclude the use of chemicals that may irritate the skin. When natural fibres are burned, they tend to singe and have a smell of burnt hair; synthetic yarns tend to melt. "The burn

test is a simple, somewhat subjective test based on the knowledge of how particular fibers burn” (Pacific fabrics2015)

Synthetic yarns, because of their construction as long, extruded strands, do not pill the way natural yarns do. Yarns combining synthetic and natural materials inherit the properties of each parent, according to the proportional composition. Synthetics are added to lower cost, increase durability, add unusual colour or visual effects provide machine wash ability and stain resistance, reduce heat retention or lighten garment weight.

Yarns are selected for different textiles based on the characteristics of the yarn fibres, such as warmth (wool), light weight (cotton or bamboo), durability (nylon is added to sock yarn, for example), or softness (cashmere, alpaca). Acrylic yarn is the least expensive. Yarns are made up of a number of singles, which are known as plies when grouped together. These singles of yarn are twisted together (plied) in the opposite direction to make a thicker yarn. Depending on the direction of this final twist, the yarn will be known as s-twist or z-twist especially when the twisted yarn is held vertically Swicofil (2015)

Filament yarn consists of filament fibres (very long continuous fibres) either twisted together or only grouped together. Thicker monofilaments are typically used for industrial purposes rather than fabric production or decoration. Silk is a natural filament, and synthetic filament yarns are used to produce silk-like effects (Classification of Fibres and Yarns, 2011).

Texturized yarns are made by a process of air texturizing (sometimes referred to as taslanizing), which combines multiple filament yarns into a yarn with some of the characteristics of spun yarns. Texturing is the formation of crimp, loops, coils, or crinkles in filaments. Texturizing processes were originally applied to man-made fibres to reduce

such characteristics as slipperiness, transparency, and the possibility of pilling. “Texturing processes are essentially concerned with introducing bulkiness into continuous filament?”

(CF) yarns” (Texturing2015)

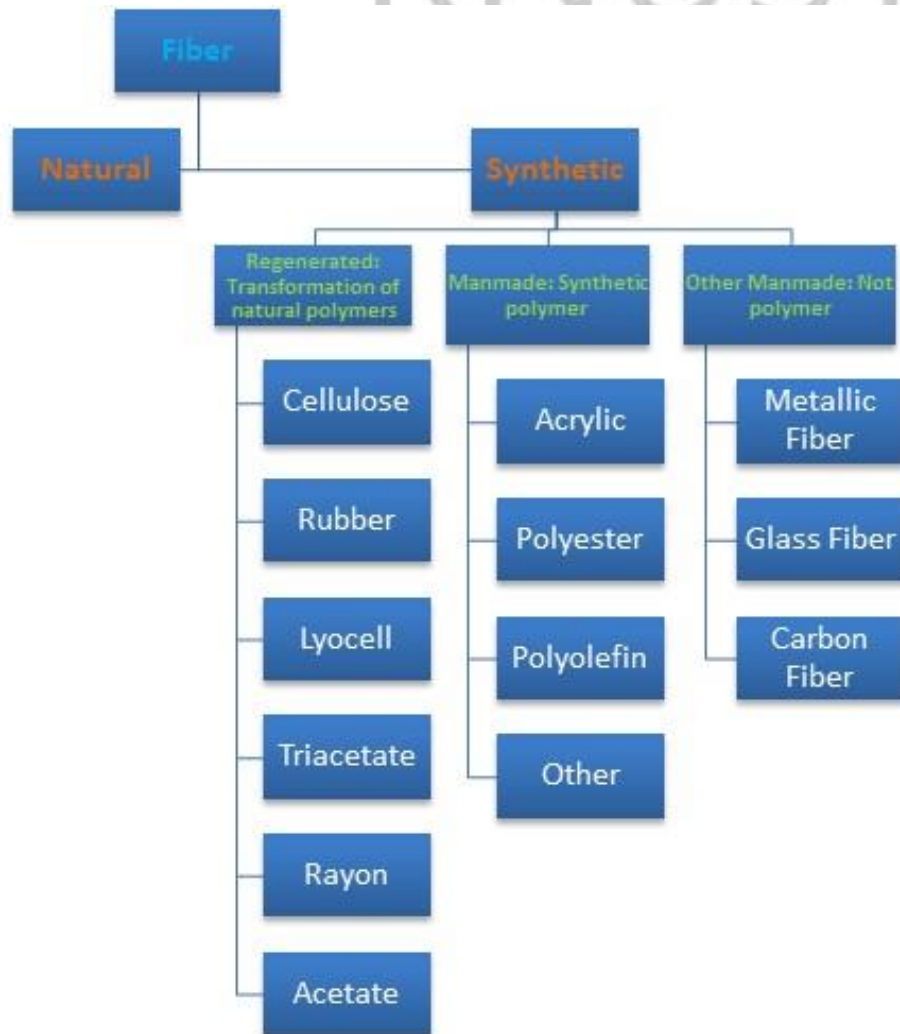
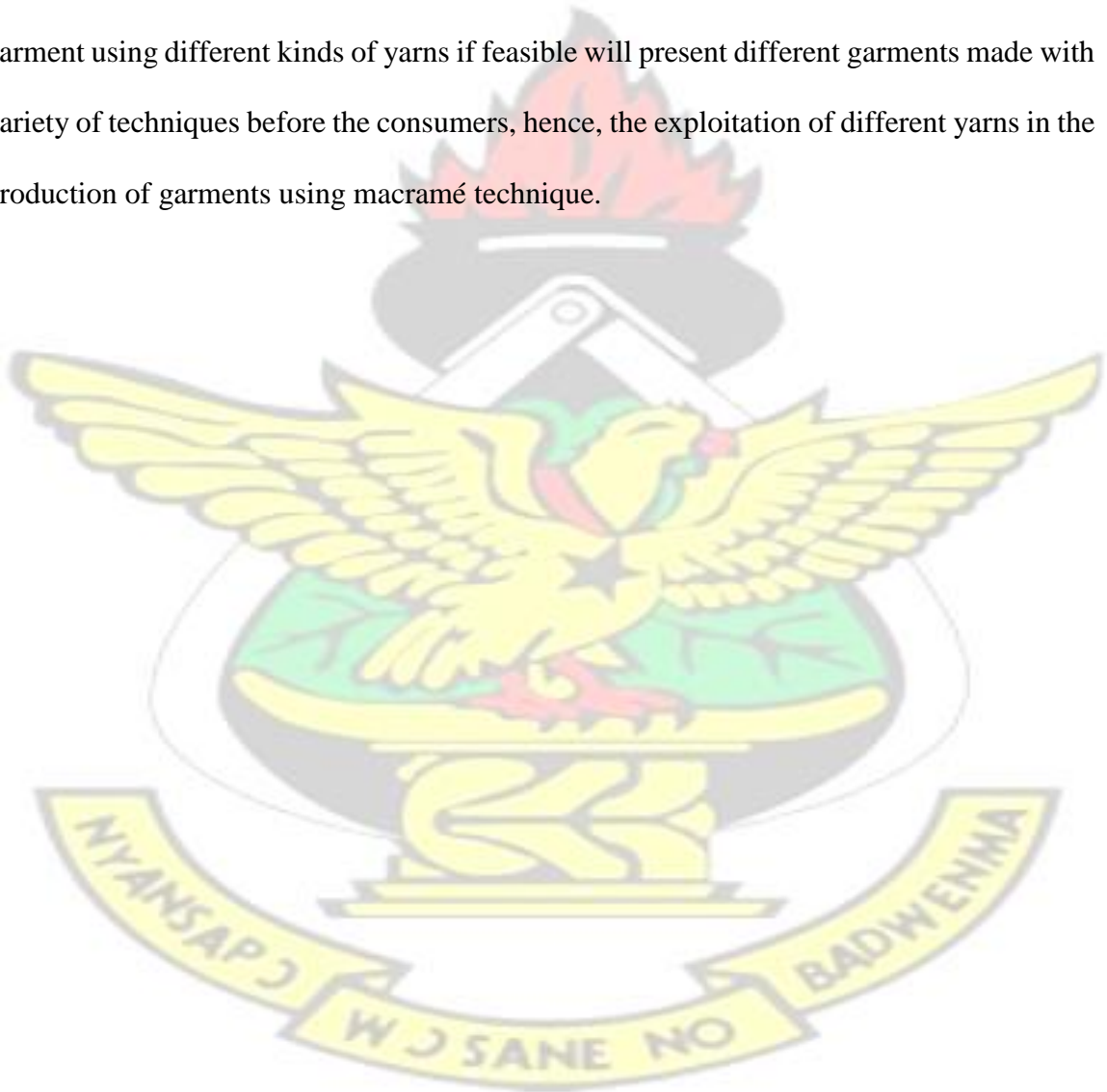


Fig. 2: Flow chart on the types of yarn Source: www.wikipedia.com

It can be deduced holistically from the above literature that, there have been many methods/techniques in textile ad fashion used for the production of garments for human

consumption. Sewing forms the major means of garment production especially in Ghana. Patterns are made using body measurement in sewing technique unlike other methods. Applique and crocheting do not find a lot of application in the field of garment production. Instead, they are used highly for decoration on garment and other items. Macramé is not known when it comes to the field of garment due to the fact that it finds no/less application in the production of garment. Therefore, the exploration of macramé in the production of garment using different kinds of yarns if feasible will present different garments made with variety of techniques before the consumers, hence, the exploitation of different yarns in the production of garments using macramé technique.



CHAPTER THREE

METHODOLOGY

3.0 Overview

This chapter covers, methodology, the research design and research tools. The main focus of this study was the exploration and description of the use of macramé technique in the production of garment using normal cotton-polyester weaving yarns and other locally available yarns instead of the macramé cords.

3.1 Research Design

Art studio practice research method was mainly used for this study. Art studio practice research method is a form of academic research which incorporates an element of practice in the methodology or research output (Wikipedia, 2014).

In this study, the researcher employed studio practice method. Studio practice or Art based research can be defined as the systematic use of the artistic process, the actual making of artistic expressions in all of the different forms of the arts as a primary way of understanding and examining experience by researchers involved in their studies (McNiff, 2013). These inquiries are distinguished from research activities where the arts may play a significant role but are essentially used as data for investigations.

Practice-based Research is an original investigation undertaken in order to gain new knowledge partly by means of practice and the outcomes of that practice. Claims of originality and contribution to knowledge may be demonstrated through creative outcomes which include artefacts such as images, designs and models, or other outcomes such as

performances and exhibitions of outcome while the significance and context of the claims are described in words (Candy, 2006).

Art studio based method was chosen based on the fact that, the researcher developed a rich or dense description of experiences regarding the use of different types of yarn/threads in the construction of garment using the macramé technique (Streubert, Speziale& Carpenter, 2003).

The various yarns were experimented to assess their feasibility for garment production, garment design development from a moodboard, and garments were produced using the macramé technique in a studio condition. The researcher identified different kinds of yarns in the market aside the yarn used for macramé. The various yarns were experimented by producing small pieces of macramé fabric using the various types of macramé knots (square, diagonal hitch, larks, Josephine, Chinese crown, overhead knots, among others). The researcher then ruled out some of the yarns like jute due to its characteristics which makes it inappropriate for the production of comfortable and wearable garment. Garments were produced using the selected yarns and were accessorized with items like bag, footwear, purse etc., hence, art studio based research. In addition to the studio practice, the researcher also used observation as a tool to identify the various yarns that are available in her locality. This was used to effectively develop and generate ideas about the creative arts of yarns used in macramé.

In accordance with Blackstad (2008), the experimental research used assisted the researcher to manipulate one or more independent yarns and techniques of macramé to determine their effects on each other. It also involved a systematic and scientific approach

so the researcher was able to control the measurement used and manipulation of the yarns used.

3.2 Research Tool

3.2.1 Observation

Observational research is type of co-relational (that is, no experimental) research in which a researcher observes on-going behaviour. There is a variety of observational research with both strengths and weaknesses. These varieties include; Participant Observation and non-participant observation. The non-participant observation, involves studying behaviour that occur naturally, there is no attempt to manipulate variables (Cadword, 2006)

With participant observation, unlike naturalistic observation, the researcher intervenes in the environment. Basically, the researcher inserts him/herself as a member of a group in order to observe behaviour he/she would not otherwise have access to. Although it seems like naturalistic observation, it should be noted that there is really a continuum of intrusion into the environment. It depends on the extent to which the researcher is involved in the research study (Price and Cadward, 2006).

Since the studio practice incorporated experimental research, three crucial characteristics like control, manipulation and observation, it was found practically useful as the researcher used all of them in the design and production of garment.

3.4 Art Studio Based

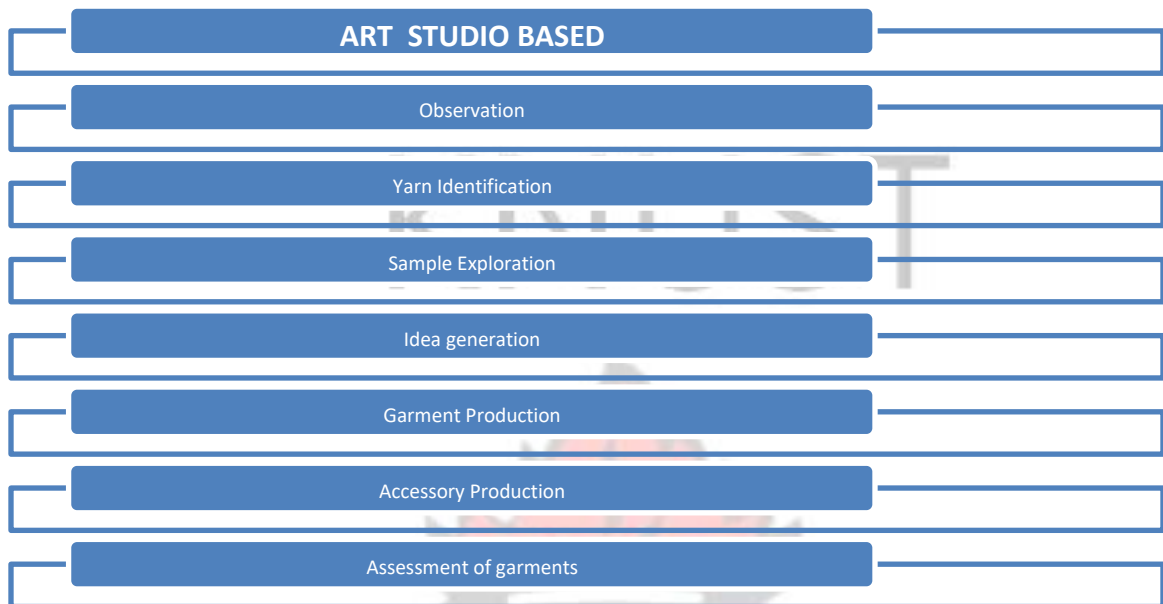


Fig 3.1: Art studio base chart

Observation: The researcher made use of observation to look for and observe the types of yarns that were in the local market of Kumasi and Sunyani as well as the various ways in which the yarns were used and the items that have been produced from those yarns.

Yarn identification: researcher combed through markets in Kumasi and Sunyani and looked for yarns which are available. Samples of the yarns found were collected for manipulation.

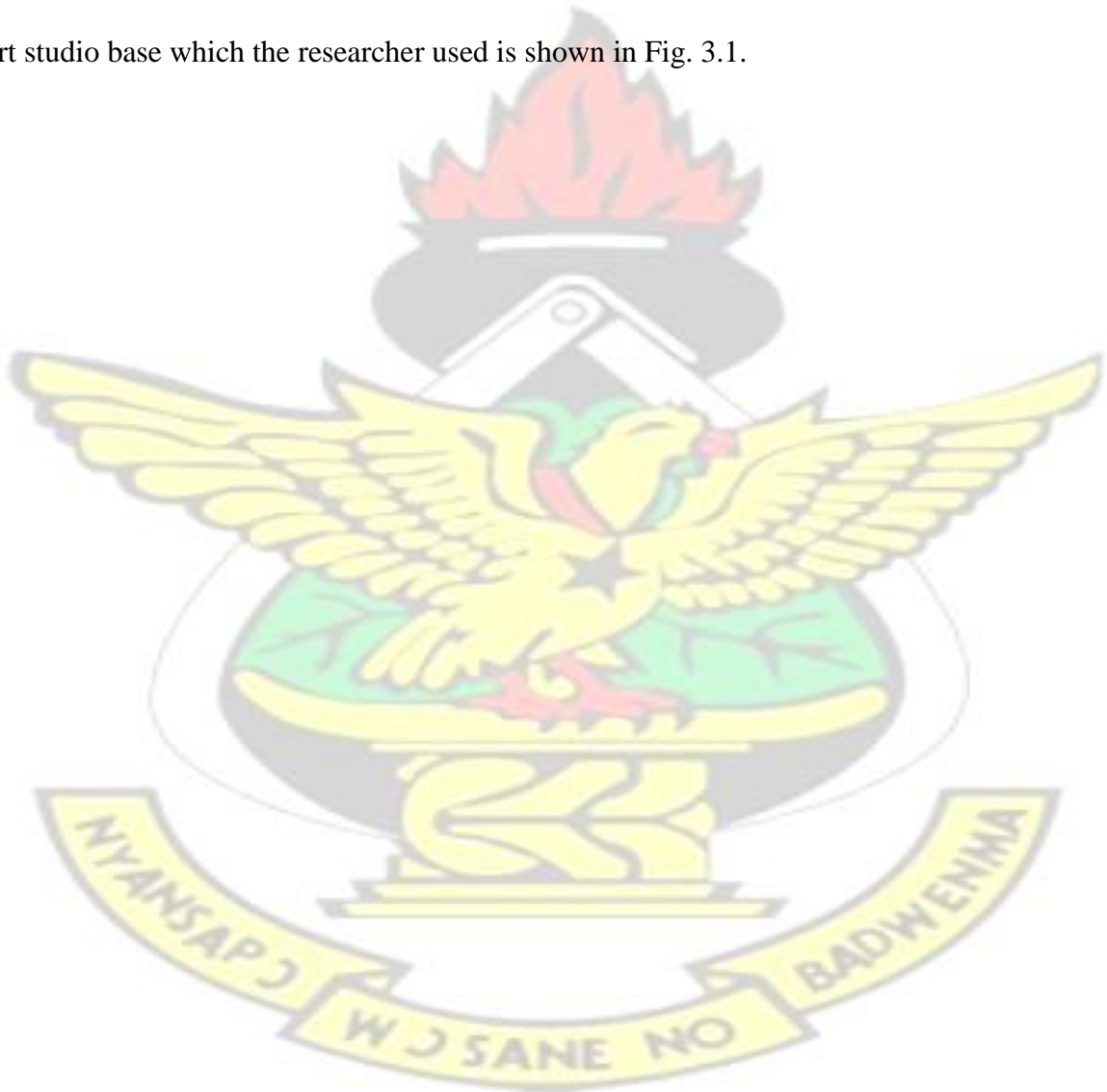
Sample exploration: the various yarns collected were used to try some of the macrame techniques to find out if they were feasible for producing garments.

Idea generation: The resulting samples produced from some of the yarns gave an idea on the type of yarn which was appropriate for the production of garment.

Garment production: after obtaining ideas of the type of yarn which were suitable for knotting, prototype of garments was made. This was assessed before the actual garments were produced.

Accessory production: Slippers and sandals were knotted as well as bags and purse.

Assessment of garment: People made to wear the garment and the footwear to assess their quality and ability to serve their purposes. The summary of the systematic approach to the art studio base which the researcher used is shown in Fig. 3.1.



CHAPTER FOUR

MATERIALS AND METHODS

4.0 overview

This chapter talks about tools and materials, sample explorations and the actual production of the garments and accessories as well as their appreciation.

4.1 Materials /Tools

According to Business Dictionary.com (2014), a tool is an item or implement used for specific purpose. A tool can be a physical object such as mechanical tools including saws and hammers or a technical object such as a web authoring tool or software program.

Macramé Project Board

The main tool needed for macramé is a project mounting board. The board is the working surface where the work is secured. However, any surface that can serve as a support can be used in place of the mounting board as reviewed in the literature. It was noted that, it is not all the time that the work needs to be supported on a mounting board before knotting.

Scissors

This tool was used in cutting the yarns.

Mounting Board

This is used to mount the yarns so as to make them hang loosely.



Plate 4.1: Mounting board

T-Pins

This is used to hold the yarns onto the mounting board.

Pattern

This is used in shaping the macramé yarn in accordance with the pattern required.

Needles

This is used to stitch parts of the macramé works together. It is also used for fixing lining and other accessories.

Measuringtape

This is used to measure the yarns and the length of the product to be produced.

Yarns:

This included different types of yarns. This is what forms the main basis for the whole project.

Beads

One of a set of small, usually round, pieces of glass, wood, plastic etc, that can be put on a string and worn as jewellery. Beads were used to secure the ends of the macramé garments so as to prevent the unravelling of the yarns. This can be used as an accessory but they were used purposely for securing the knots.



Plate 4.2: Beads

Other materials include:

- Lining
- Zip
- Buttons
- Sewing thread
- Soles

Survey findings (Identification of available yarns in the market)

Below are the different types of available yarns in the market manipulated and used by the researcher in the study.



Plate 4.3: WADC yarn



Plate 4.4: Nylon twine



Plate 4.5: Fishing net twine



Plate 4.6: Pure cotton cord



Plate 4.7: Sack sealing thread (Rubber yarn)



Plate 4.8: Nylon yarn



Plate 4.9: Cotton polyester yarn



Plate 4.10: Jute yarn



Plate 4.11: Woollen yarn



Plate 4.12: Hair plaiting yarn

Uses of the identified available yarns in the market (Survey findings) • Cotton-polyester yarn

This type of yarn is popularly identified as cones by the weavers. It comes in different forms namely, cones cheese and hanks. It usually found its usage by the seamstresses/tailors for sewing garments (Osei, personal communication, and 25/04/2015). Kente weavers also used cotton-polyester yarns to weave Kente fabric, textiles industries in Ghana especially Juapong Textiles in the Volta region use cottonpolyester yarns for weave plain fabric meant for printing and dyeing. It sometimes found its usage in hairdressing salon by using it to tie hair.



Plate 4.13: Cotton-polyester

yarn in weaving cloth



Plate 4.14: Cotton -polyester yarn in use for neatening fabric edges

- **Woollen yarn**

Woollen yarn is used in crocheting accessories like bags, purse, sweater, table cover etc. it is also used for finishing the edges of apparel for kids basically for decoration and also for plaiting hair.



Plate 3.15: Black woollen yarn



Plate 3.16: Woollen yarn used for plaiting hair used in crocheting

- **Fishing-net twine**

As the name implies, fishing-net twine is often used by fishermen for the production of their fishing net and the mending of their fishing net. Cobblers make use of this yarn to mend/stitch together torn parts of footwear. It has not been found in the production of

macramé items (Owusuaah, personal communication, 24/04/2015). Shoe makers also use of the same yarn to sew footwear by the use of sewing machine (Plate 4.17).



Plate 4.17: a shoe maker using sewing of sandals with a fishing net footwear **Plate 4.18: a cobbler sewing fishing net twine for twine**



Plate 4.19: Head net from fishing net twine

- **WAEC thread**

WAEC thread is used for attaching or collating extra sheet of papers; binding together bundles of money. It is also used as a cord in curtains to enable the hanging of the curtain from one point to another and also used loosely in long length of products like curtains in shops on which products are hanged. Below are the illustrations of some of the uses of WAEC thread (Plate 4.20& 4.21).



Plate 4.20:

thread



Plate 4.21: WAEC thread used in the waist of a pair of shorts

WAEC

thread used for collating extra sheets

- **Jute yarn**

This type of yarn is basically used for the production of sacks in which goods like cocoa are packed. It can be used to produce bags. It has great limitation in terms of its application due to its nature. Below are illustrations of the end uses of jute.



Plate 4.22: Jute bag



Plate 4.23: Pots decorated with jute yarns

- **Rubber yarn**

As its name implies, this is a rubber-like yarn. It is highly hydrophilic and strong, that is, it hardly tears as compared with the other yarns. It is highly used in tying products

such as bales of clothes and sacks (Plate4.24). They are used for tying husks as illustrated in Plate 4.25.



Plate 4.24: Rubber yarn Plate 4.25: Corn husks used for tying sack tied together with rubber

yarns

4.1.1 Production process

This section discusses the general production process for the project. It started with the mood board which is the main source of inspiration from which all the designs were created. It exhibits the exploration of the available yarns that were used after which a prototype was created to give a general look of the final work; sketch models were made and finally, the actual production process was described vividly. The later part of this section discusses the uniqueness of the whole project taking into consideration the individual works and the challenges that the researcher faced in executing the works.

4.1.2 The mood Board

The mood board is inspired by the connective nature of chains and therefore the theme “*Interdependency of life*”. There is a proverb that states that, “a single tree does not make a forest”. This implies that, in life everyone needs the assistance of another in order to achieve certain goals. With macramé technique, the knots are created in such a way that every knot rests on a yarn before it becomes a complete knot. This therefore implies that, a

yarn cannot create a knot in macramé by its own but has to depend on other yarns in order to create the knot. This symbolises reliability and dependency in life especially in times of need when one requires the support of other fellows, hence the need to leave in harmony and unity so as to earn the support of other fellows whenever one is in need. The major colours of the mood board are carefully selected with the consciousness of the African preference of colour. These colours include brown, black, grey, cream and white being the dominant colours as in Plate 4.26.



Plate 4.26: Mood board

4.1.3 Sample Exploration (Manipulation of Yarns)

After obtaining different available yarns from the local market, the first thing to do was to try them with the various macramé techniques and identify which type of yarn was

appropriate, and which type of knot was appropriate for the production of garments and accessories using the macramé technique.

Ten different yarns were explored using at least six different types of knots and the effects were examined. The knots include; square knot, square knot sennit, half knot, half-hitch knot, big square knot, and Josephine knot including starting/mounting knot (lark's head knot). The yarns explored were jute, nylon, cotton, cotton- polyester blend, twine, WAEC thread, Sack sealing thread, woollen thread and rubber tread (for hair plaiting).

Step One: Warping (Cutting of Yarns

The yarns were unravelled and plied without twist according to the number of yarns required. The number of yarns in the ply depends on the fineness or coarseness of the yarn. This means the finer the yarn, the higher the number of yarns in a ply. The required length of the yarn is measured with tape measure, warped from one supporting end to another and cut into the various ply using scissors (Plate 4.27). Some of the yarns were not plied based on the fact that, the researcher noticed that some of the yarns are already plied and do not require plying again to make it bulky. A mixture of yarns was made by arranging different colours of yarns to break the monotony in colour (Plate 4.28 and 4.29). After warping, the yarns were kept by gathering and winding them around the hand and pulling through to prevent it from entangling as illustrated in Plate 4.30.



Plate 4.27: Preparation of yarns



Plate 4.28: Warping of yarns



Plate 4.29: A mixture of cotton yarns



Plate 4.30: Gathered and wound yarn (to prevent entanglement)

Step Two

- **Mounting**

At this stage, a ply yarn was picked and two overhand knots at different intervals on the same yarn were made. The researcher supported each of the knots on the mounting board with the help of pin or nail as illustrated in Plate 4.31. The researcher then mounted the rest of the yarns on the part of the yarn between the two overhand knots (Plate 4.32). It can be noted that mounting can also be done in the hand without the use of mounting board.



Plate 4.31: Two overhand knots supported with pins



Plate 4.32: The rest of the yarns mounted between the two overhand knots

Step three: Knotting

The researcher began to knot with alternating square knot to about 4 inches. The knots were subsequently varied until the yarn got exhausted (Plate 4.33).



Plate 4.33: Alternating square knot with cotton yarn

4.1.4 Sample production

Woollen Yarns

The same steps discussed above were used to prepare the yarns. This sample is a mixture of sea blue and brown and the knots used were alternating square knot, square knot sennet, half knot and josephine knot. The resulting sample from this type of yarn is very light, and the alternating square knot is compact, making it more wearable. The sample in Plate 4.34 shows that, appearing in a monotonous colour may be more pleasant than the mixture of yarn. The multi-coloured yarns used look conflicting. Based on this, the researcher deems it suitable to use one-colour yarn. It was also observed that, more woollen yarns were used to produce the sample, hence, more woollen yarns will be required in the production of a garment. Nevertheless, the resulting garment will be good to wear due to its light weight and for that matter will be easy to wear.



Plate 4.34: Sample from mixed woollen yarns

Nylon threads (dry line)

This sample in white is very strong. It is made of big square knot, diagonal halfhitch knot, square knot sennit, half (snake) knot and alternating square knot. Generally, the sample appears nice and stronger but is too hard to wear due to its rough texture. Also, the snake knot and the half knots are so rigid that if one wears a garment with those knots, he/she will not feel comfortable in it. For instance, footwear made with this sample may cause bruises on the feet.



Plate 4.35: Sample from nylon yarns

Aran Cotton Twine (WACE thread)

The same yarn preparation as indicated above was used for the production of this sample. This type of twine appears in ash or grey. They are coarse and easy to knit. The resulting square knot appears compact as well as the rest of the knots such as horizontal hitch knot, Josephine knot. After the production, it was observed that the sample is bossy and can be very durable. It will wear well under cold weather due to its heaviness. Also, the over hand knot and Josephine knots are hard to wear in this sample (Plate 4.36).

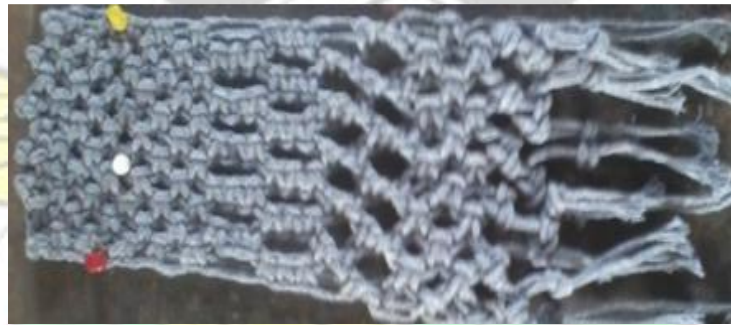


Plate 4.36: Sample from Aran cotton twines (WACE thread)

Jute yarns

The jute appears in brown and has some hair-like fibres on the surface. It is easy to knot and has good effect but it chocks when working with it even though it is strong. It produces compact knots but the chocking scent and hairy nature will make it difficult to wear. It can also cause skin itches or rashes. Due to this, the researcher deemed it not necessary to use jute yarn for the production of garment.



Plate 4.37: Sample from jute yarns

Cotton-polyester weaving yarns

These types of yarns are cotton and polyester blend. They come in different colours. White yarn was used for the production of the sample. This sample consists of alternating square knots, half knots, big square knots, and Josephine knots including over hand knots. From the researcher's observation, apart from Josephine (flat) knots which appear hard, the rest of the knots (half knots, big square knots, and Josephine knots) look compact and knotting was moderately better with cotton-polyester yarn than with woollen yarn. These types of yarns do entangle but not as much as that of woollen. From the researcher's assessment, the cotton-polyester sample appears comfortable to wear but many yarns are needed in each ply for a large piece since it can withstand tension and as a result compact knots can be created with it.



Plate 4.38: Sample from cotton-polyester yarns

Sample from pure cotton cord (mercerised cotton).

Similar yarn preparation was used for this yarn as in the previous yarn. Due to the thick size of the cord, the researcher unravelled the cord into yarn for the study to prevent or reduce bulkiness in the sample. The effect of the sample in general appears very compact with most of the knots but unravelling the cord to obtain the yarn was very difficult. While unravelling, it twists on its own again unless the other end is held by another person. This implies that, obtaining the quantity which will be enough for garment will be more time consuming than normal. This yarn has similar effect as that of cotton-polyester blended yarn sample.



Plate 4.39: Sample from pure cotton cord

Sample from Nylon (fishing net twine)

This type of yarns comes in different colours mostly white and black. It is the type of yarn used mostly by shoe makers in stitching torn parts of shoe(s). Similar yarn preparation as stated earlier was used to treat the nylon yarn. This type of yarn has a fine and smooth nature as compared to the other yarns. A smooth and compact resultant sample was derived due to the nature of the yarn. Furthermore, the sample is very elastic at all directions and for that matter makes it easy to wear. From the researcher's observation, knotting with this type of yarn (nylon yarn) is difficult since it does not hold the knots; meanwhile it yields better result after working. Based on the difficulty in

producing the sample as it unravels at the ends; beads were used to secure the ends. The unique feature of the use of this yarn as compared to the other yarns is that, knots created with nylon yarns are soft and look comfortable to be used for garment and other articles.



Plate 4.40: Sample from fishing net twine (fishing net and twine)

Plate 4.4: Unravelling of the ends

The comparison of the yarns made above have been simplified in the table form as shown below;

Table 1: Comparison of Yarns

Name of yarn	Strength/tenacity	flexibility	Ability to knot	Appearance	Texture comfortability	Availability
Aran cotton	Strong	Flexible	Very well	Bright	good	available
Nylon twine	Strong	Flexible	Moderately well	Very bright	Too hard to wear	available
Fishing net twine	Very strong	Flexible	Well	Very bright	Very soft, good to wear	available
Cotton polyester	Very strong	Flexible	Very well	Very bright	Good to wear	available
Jute	Very strong	Flexible	Very well	Dull /fluffy	Too rough	available
Woollen	Strong	Very flexible	Very well	Bright	Soft and light to wear	available

Sack sealing (rubber Yarn)	Very strong	Very flexible	Not really	Rough	Too rough to wear	available
Purecotton	Strong	Flexible	Very well	smooth	Good to wear	Not available

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4.2.0: The production of the macramé garment and accessories (Sketch Model)



Fig. 2: Garment design one



Fig. 3: Garment design two



Fig. 5: Garment design three

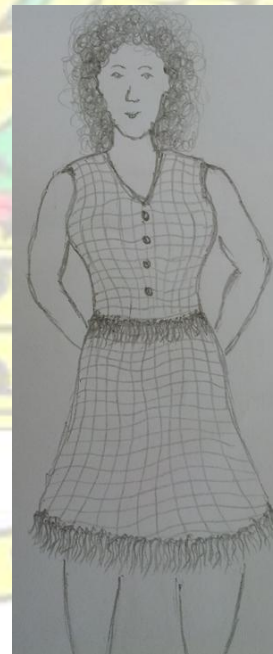


Fig. 4: Garment design four

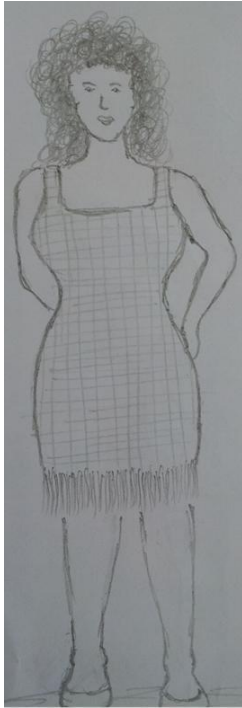


Fig. 6: Garment design five

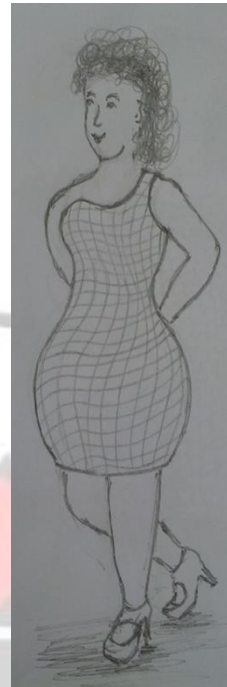


Fig. 7: Garment design six

Sketch models were made from the moodboard which serves as a guide for the shape or design of the garment.

4.2.1 Production of Prototype (garment)

Prototype is basically known as sample, miniature or model, which is made to test an idea or process. The samples above were tested to know their feasibility for the production of prototype garments.

After exploring with the yarns and the macramé techniques to examine which type of yarns as well as macramé knots will be appropriate for garment production, garments were then produced. Ideas for the garment in the form of sketches of garment designs were initially generated to enable the researcher presume/guess a shape and design of garment to be produced. Cotton-polyester weaving yarns were chosen to make the prototype due to

the compactness of the knots in the sample made which ensures comfort and modesty as compared to the other yarn samples. Also, that type of yarn was easy to come by in terms of availability in the market. Garments were also produced from fishing net twine, woollen yarn and WAEC thread. Nylon and jute were not used because; it is hard on the body and will cause health problems respectively.

4.3.0 Yarn preparation

The cotton-polyester yarns were unravelled and cut into estimated measurement by supporting the cones on nails pegged on a piece of wood (spool rack) as in Plate4.42& 4.43. The yarns were unravelled and connected to another peg at required length to and flow till required number of yarns in a ply was obtained Plate4.42.



Plate 4.42Unwinding of white yarn



Plate 4.43Unwinding of red yarns



Plate 4.44: The yarns hanged on a nail Plate 4.45: Yarns gathered for later use

The yarns were cut and hanged on a support against a wall until desired quantity was obtained (Plate 4.44). To prevent them from entangling, the yarns were gathered and pulled through in the form of a loose type of overhand knot before keeping. This becomes necessary to prevent the yarns from entanglement since the yarns are to be kept for later use (Plate 4.45).

4.3.1 Mounting

The cotton-polyester yarns were then mounted and considering the sketch model, the selected knots were used to produce the work. Mounting of the yarns in the initial stage could also be done by using any of the mounting knots especially lark's head knot and overhand knot by securing the knot on a holding cord. The work could also be started with half knot without initial support before pegging it on a mounting board to prevent entanglement especially when the yarns are too long. In this prototype, half knot was used as mounting knot. Due to this, the yarns were mounted or held in the hand during knotting as seen in Plate 4.46& 4.47.



Plate 4.46: Beginning of the half knot



Plate 4.46: Yarns laid for knotting



Plate 4.47: Creating the half knot

The researcher noticed that, the garment can be knotted from the top to down to the desired length. Front and back can be knotted to some extent before joining the two at the shoulders. It can also be knotted from the shoulder and gradually developed downwards as yarns are added. In this garment production, the shoulders were made separately with square knot likewise the front and back before joining them with the same knot. Plate 4. 48 and 4.49 show the parts joined to form one side of the dress.



Plate 4.48: Sleeve & front of initial stage



Plate 4.49: Front part of the initial stage

Having in mind elements and principles of design, the colours were carefully selected and arranged rhythmically as square knots; half knot (snake knot) and square knot sennit were alternated. It was noted that the shape of the garment can be obtained by adding or ignoring a certain quantity of yarns or by changing the type of knot

at certain stages of development. For instance, alternating square knot in its compact form can be used for the waist while the hip can be knotted with big square knot or the loose form of the same knot. On the other hand, extra yarns can be inserted at the hip side as in Plate4.50 to make that portion broader than the waist if the same knot is used throughout as shown in Plate 4.51. Where it required to be narrowed in some parts of the garment, some of the yarns were ignored gradually as the knot progresses and later secured and cut off.



Plate 4.50: Inserting extra yarn



Plate 4.51: Effect of additional yarns

The alternating colours of pink and white macramé garment were obtained by carefully selecting the yarns rhythmically. As the name of the knot implies alternating square knots, will definitely alternate the design, hence the rhythmic effect of pink and white as in Plate4.51.

Garment Two from Cotton Polyester Yarns

The same method of yarn preparation was used for the production of this garment. For this garment, the researcher used white and a mixture of yarns of different colours to give a sense of harmony of garment colour. Pink, brown and cream coloured yarns were

mixed to obtain the light brown coloured yarn and was used with white for the production of the garment. Compact square knot was used for the upper part of the skirt to enable it attach to the human body well while big square knot was used for the lower part of the skirt (hip side) to broaden or expand the hip area so as to suit women of different hip sizes. With the top, buttons were made at the opening to enable easy wearing and removal of the garment by the wearer. The edges (hem) were made friable rather than knot due to the bulky effect that is created by the knot at the edge.



Plate4.52: Cotton-polyester macramé skirt

Plate4.53: Cotton-polyester macramé top



Plate4.54: Back of skirt with zip (opening)

4.3.2 Measurement

The researcher did not take any specific measurement of a model. The researcher aimed at producing the garment for anyone whom the garment will fit. Due to the elastic nature of the garment to be produced, it will fit majority of people of different sizes.

4.3.3 Actual production of the garment using aran cotton/ WAEC thread (“nikka” ahoma).

The various steps through which the prototype were produced were used to produce the main macrame garment. The yarns were initially warped to the required length, etc.

Step one: Preparation of material.

Warping: The yarns were unwound and cut to the required length till enough quantity was obtained.

Mounting: After cutting the yarns in the first stage (warping), the outcome in the garment production was mounting. At this stage, the first yarn was mounted horizontally on two supports (nails) against a working surface (mounting board) by creating overhand knots at two intervals on the yarn and fixing the overhand knots on the nails. The rest of the yarns were picked and each ply yarn was folded into two equally. Starting from the middle or the

folded part, lark's head knots were used as mounting knot to start the sleeve of the garment. The picture of the lark's head knot is shown in Plate 4.56.



Plate 4.56: Lark's head knot



Plate 4.57: Sleeve

Square knot sennit was used to begin the knotting to the required length of the sleeve as in Plate 4.56. The square knot sennit was used because narrow sleeve was required for the garment. After getting the required length of the sleeve, yarns were added at both sides to complete the length of the sleeves. Square knot was used to join the sleeve as the yarns were added (Plate 4.57). This process continued gradually until the required width of the bast of the garment was obtained.

To allow opening at one side, the bast was made in two parts; the front side and the back before joining the one side by taking the last two yarns from both sides and creating square knots with those yarns as illustrated in Plate 4.58 and Plate 4.59.



Plate 4.59: Joining one side of the

Plate4.58: Front and back bast of garment bast of garment

The opening at one side was created in order to fix zip which can be opened and closed before and after wearing respectively. The front and back were joined at the shoulder by connecting additional yarns and creating square knots with the additional yarns(Plate 4.60).



Plate 4.60:Joining the front and back of the garment at the shoulders.

After this stage, the compact form of square knots were used to knot the garment to the required length of the front and the back up to the length which will be enough for the zip. After achieving the required zip length, knotting was continued in a circular motion to seal both sides.



Plate4.61: Hip of the garment made with large square knots.

The hip side was made by changing the smaller square knots to big square knots (Plate 4.61). The size of the knot was purposely changed to shape the garment by broadening the hip area to conform to the shape of the body. After obtaining the hip length, the compact form of the alternating square knot was used again to narrow the lower part of the garment. The macrame technique used for the upper part of the garment is an alternating square knot. The right side was left open for the zip to ensure easy wearing of the garment. The big square knot was used to create the balloon-like shape and later closed up with the square knot again. Lining was used to block the spaces in the big square knot to introduce modesty of the macrame garment. It was made to appear smaller and smart because the yarns used to produce this type of garment was coarse and heavy. The result of the garment from aran cotton yarn is shown in Plate 4.62 below.



Plate 4.62: The final macrame garment from aran cotton thread

Garment Produced with Fishing Net Twine

Similar macrame knots such as square knot, diagonal hitch knot, chinese crown knot etc used in the previous garment production were used for the production of the fishing net

twine macrame garment. White and black fishing net twine were used for the production of the garment based on the fact that they are the readily available colours in the market. Square knot sennit was used for the handle. Compact square knot was used for the upper part of the garment while big square knot was used for the main body to provide ease in wearing the garment. Overhand knot and beads were used to secure the edges at the base (Plate 4.63).



Plate4.63: Fishing net twine macrame garment

Garment four made from woollen yarns

Square knot was used in the production of the garment below using woollen yarn. The yarns were left at the hem for decorative purpose. It was harmoniously rendered in shade of blue to give a sense of coolness to the wearer. A cord was inserted in the waist to enable the wearer tie the skirt to the waist. Square knot was used for the production of these garments.



Plate 4.64: Top of woollen macrame garment



Plate 4.65: Skirt of woollen macrame garment

4.3.4 Production of accessories

Bag one (The black bag) • Production of the bag and its handle

With the production of the macramé bag, the researcher noted that the bag can be made before fixing the handle or the working process can start from the handle right away and continue with the main bag. The researcher initially made the bag before making the two handles separately and later fixed on the bag.

The required length of fishing net twine yarns and woollen yarns were cut in the first stage. Afterward, a mixture of both yarns was mounted on a cotton yarn using lark's head knot. The researcher blended fishing net yarn which is slippery and woollen yarn which is not slippery so as to bring friction during knotting (that is, to adhere well during knotting) and after the production of the bag. The cotton yarn was purposely used to ensure stability of the mounting knots since the fishing net twine yarns are slippery (Plate 4.66). After mounting, square knot was used to start the knotting of the bag (Plate 4.67).



Plate 4.65: Mounting of knot



Plate 4.67: Knotting with square knot

- **Joining of the two ends**

The bag was knotted to the desired height before joining the two ends of the cotton yarns by knotting with overhand knot as illustrated in Plate 4.68& 4.69.



Plate 4.68: Bringing both ends together



Plate 4.69: Joining the ends by knotting

- **Shaping the bag**

After joining, the bag was knotted with square knot in a circular motion. Josephine knot was used to continue the knotting in order to mould the shape of the bag by opening the portion of the bag where the Josephine knot was used (Plate 4.70). Square knot was used again to narrow the lower part of the bag thereby giving the bag a ball-like shape as in Plate4.71.



Plate 4.70: Bag knotted in a square knot



Plate 4.71: The shape of the bag

- **Turning over and finishing**

After obtaining the required height of the bag, it was turned over to the wrong side and the base of the bag was secured by knotting with a finishing knot (double of the overhand knot) as in Plate 4.72&4.73. It is imperative to note that square knot does not have wrong side, that is, the effect of the knot appears the same at both sides. Therefore, the researcher decided to choose one side as the wrong side and made the finishing at that side. The effect obtained with square knot at both sides is not the same with lark's knot (it has wrong and right side); hence, lark's knot cannot be used in such manner.



Plate 4.72: Turnover of the bag **Plate 4.73: Securing the base with overhand knot**
• **Cutting and securing**

The excess yarns were cut off with scissors and then the edges were melted with the help of candle light. When the melting was in process, the moulting part was pressed with the hand to touch the bag to secure it due to the fact that, the yarn is very slippery. It is important to note that, a metal like cutlass could also be heated and the edge used to cut and finish at the same time. In the case of cotton yarns, lark's head knots could be used to secure the overhand knots as final finishing knots.



Plate 4.74: Cutting of excess yarns

Plate 4.75: The bag without handle

• **Making of the handle**

The handle was made by cutting yarns to the required length. The yarns were mounted by connecting them to a support as in Plate 4.76. Enough yarns were used to maximize the strength for the handle. Square knot was used to knot the handle as in Plate 4.77. Other knots such as half hitch knot to secure yarns internally (finishing), overhand knot (for finishing the loose yarns after production) and Chinese crown knot could also be used for the handle.



Plate 4.76: Mounting knot sennit for the handle **Plate 4.77: Knotting square** **Plate 4.78: Fixing of the handle to the bag**

The handle of the bag can be one, two or even more depending on its use so far as this particular bag is concerned. The researcher made two handles for the bag as in Plate 4.78 after obtaining the required length of the handle.



Plate 4.78: The two handle of the bag

Plate 4.79: Knotting the handle to the bag



Plate 4.80: The finished bag made with square knot and Josephine knot

Bag two

With this type of bag, the researcher initially produced the handle before the production of the main body of the bag. The yarns were cut to the required length and square knot was created at one side. Afterward, it was mounted on a support as in Plate 4.81.



Plate 4.81 Mounting of the handle



Plate 4.82 Plaiting of the handle using Chinese crown knot

After mounting, the yarns were plaited to the required length of the handle (Plate 4.82). Since the handle was forming part of the main bag, its length was cut extremely longer (about twice) than the yarns for the actual handle. The yarns were cut and mounted separately (as in Plate 4.83) by using square knot after which they were joined to the handle with the same knot. The colours were carefully arranged in consideration to the elements and principles of design such as rhythm and balance. Such arrangement is seen in Plate 4.83.



Plate 4.82 Mounting of the bag



Plate 4.83 Joining the body and the handle

Diagonal half hitch was used along the „V“ shape effect in the bag by pulling the cream yarns along those „V“ shapes and covering them with the grey colours. This process continued till the required length of the bag was obtained.



Plate 4.84: Diagonal half hitch **Plate 4.85: The final bag made** was used along the „V“ shape with square knot and diagonal effect.

Other Bags

Square knot and Chinese crown knot were used to produce the WAEC yarn bag: square knot for the body of the bag and Chinese crown knot was used for the handle. Square knot was used for the woollen yarn bag. Josephine knot and square knot were used to produce the fishing net twine bag while the researcher used horizontal hitch, diagonal hitch and square knot for the production of the bag made with cotton-polyester yarn.



Plate4.87: Bag from WAEK yarn



Plate 4.88: Bag from woollen yarn



Plate4.89: Purse from fishing net twine

Footwear

Below are the footwear produced by the researcher to accessorize the garments produced. The various types of macrame knots such as square knot, chinese crown knot, diagonal hitch knot and overhand knot were used in the production of the footwear. They were made on black base/sole based on the fact that, black is highly used in such footwear and black soles are usually available as compared to the other colours.



Plate 4.90: Footwear from Cotton Plate 4.91: Footwear from Cotton yarn yarn using Chinese crown knot, using Chinese crown knot, overhand diagonal half hitch and square knot. knot and square knot sennit.



Plate 4.92: Slippers from fishing net twine using Chinese crown knot and diagonal half hitch knot



Plate 4.93: Slippers from woollen yarn using Chinese crown knot

4.4 Appreciation of the Garments and Accessories

This section of the project deals with the description of the results that were obtained by the researcher in the studio exploration process of the various macramé techniques and locally available yarns.

After exploring the various yarns and macramé techniques, the researcher selected four types of yarns; the normal weaving yarns, woollen, fishing net twine and Aran cotton twine. The major macramé technique used was square knot, due to its compact nature. Other knots like big square knots, larks' head knot and half hitch knot as well as Josephine knot and over hand knot were also used.

The macramé effect obtained with the various yarns indicates that, macramé garments are suitable for wearing, most especially by the celebrities.

- **Garment from Aran cotton (WAEC thread)**

Plate 4.94 is the garment resulting from the WAEC yarns and macramé techniques in this garment are lark's head knot was used for mounting and alternating small and big square knots for creating the garment. Smaller square knots were used for the upper part of the garment while the bigger square knots were introduced at the hip to broaden the hip of the garment in order to comfortably accommodate the hip of the wearer. It has only one sleeve and accessorized with bag and a pair of sandals as in Plate 4.95.

Neutral colours (cream and grey) were used for the production of this garment. The researcher aimed at producing this garment to be able to be accessorized with many different colours of accessories and places. This therefore makes it fit to be used for many different occasions.



Plate4.94: WAEC thread macramé garment



**Plate4.95: Cream and grey WAEC garment accessorized with violet and white
purse.**

- **Garment made from woollen yarns**

In Plate 4.96 is the garment (blouse) resulting from the woollen yarns and macramé techniques. In this garment is lark's head knot for mounting and alternating square knots for knotting the garment. The rhythmic pattern in this garment was made in two colours, blue and blue green, by using alternating square knots. The front part of the blouse is made opened with buttons to enhance easy wearing. The skirt in Plate 4.97 is made of lark's head knot as the mounting knot by mounting it on a rayon cord. The rest is made of alternating square knots. The rayon cord at the top part of the skirt can be untied and retied before and after wearing respectively. Both the skirt and the blouse are knotted up to some point and the rest of the yarns frayed to provide ease or comfort. The colour patterns in the skirt are different from that of the blouse due to the exploitation of different coloured yarns in the project by the researcher. Blue yarns were added at the left part of the skirt to create variation and colour harmony in the design. The resulting garment gives an interesting design with good aesthetic appeal of how the two colours in the skirt and the blouse harmonize (Plate 4.98).

In considering the elements and principles of design in this garment, the researcher is of the view that the garment would be best suited for formal wear for young female adults because of the compact nature of the knots and the lightness of the garment as well as the bright colours since such colours are mostly attracted by females of such calibre.



Plate 4.96: Blouse from woollen yarns



Plate 4.97: Skirts from woollen yarns



Plate4.98: Woollen macramé garment

The combination of white and pink in the prototype garment Plate 4.99 make each contrasting colour in the mixture appear brightly. The alternating colours and alternating

macramé techniques give rhythmic effects which also create balance in the design as well as harmony. This garment may be good for children under seven years.



Plate4.99 Cotton-polyester prototype

- **Garment made from a mixture of yarns and plain white yarns (cotton polyester yarns)**

The sample in Plate 4.100 and 4.101 are a macramé garment (blouse and skirt) made from a mixture of different colour of cotton yarns and white yarns. The garment which has a mixture of different colours such as pink, brown, khaki, cream and the like was knotted with alternating square knots and the same knot was used in the skirt.

However, the mounting knots in the skirt were lark's head knots while that of the blouse were square knots. The white yarns were used in alternating with the mixture of different

colours of yarns which appear brownish. The researcher aimed at enhancing the aesthetic value of the mixture of different colour yarns by adding white which served as complementing colour to the brownish effect. As a result of the white, the garment appears much brighter thereby appealing to the viewer. The colour patterns in the skirt and the blouse were varied to break monotony.

However a little brown was fixed in the middle part of the blouse just to create balance in the design even though breaking of monotony is paramount. The two colours were combined to access the resulting effect which yielded good result as in Plate 4.102 below.



**Plate 4.101: Skirt from
Plate 4.100: Blouse from mixture of yarns mixture of weaving yarns**



Plate4.102: Cotton-polyester macrame garment

- **Garment made from fishing net twine**

The result of the garment obtained from the fishing net twine is seen in Plate 4.103. This type of yarn was known to be very slippery especially when knotting. The researcher intended to alternate black and white colours to enable the identification of group of yarns to pick at each stage of knotting. The researcher intended to line the garment with purple lining to modestly appear in the pores of the knot. With this intention, a purple colour of yarns were added to the handle to result in colour harmony but upon second thought of the lightness of the purple lining, black was chosen as lining, hence, the colour of the handle.

The beads in the garment were not meant for decoration; rather, they were used to solve problems in the knotting process which then resulted in adding up to the aesthetic

value of the garment. The researcher faced some challenges tightening the square knot due to the slippery nature of the yarns. Due to this, the beads were fixed at the end of the square knots to enable a change from square knot to a different knot. The beads were again fixed at the lower part of the garment to secure the finishing knots. Interestingly, the yarns' inability to hold knots firmly has made the finished product so elastic that it can be stretched both vertically and horizontally without distortion of the shape. Furthermore, it can conform to the forms of different ladies who can wear this garment due to its elastic nature.



Plate 4.103: Straight dress knotted from fishing net twine

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Overview

This chapter constitutes the summary of the study, conclusion and the various recommendations made by the researcher at the end of the study.

5.1 Summary

The study was basically an art studio-based research. The researcher aimed at exploring with different yarns in the market to produce macramé garments. The researcher noticed that, garments have been produced with many different textile and fashion art techniques but not macramé. The study sought to introduce the macramé technique to know its feasibility for the production of macramé garments which will then present before consumers variety of garments to choose from. Objectives and research questions were structured to serve as a guide and to enable the researcher gather the necessary data for the study respectively. The researcher visited many macramé artisans in Kumasi metropolis purposively to gather data for the study. Samples of macramé were experimented with different yarns namely: jute, cotton-polyester, Aran cotton twines, rubber twine and woollen yarns.

Some of the yarns such as twines exhibited compatibility and also elasticity of garment while cotton-polyester yarn came out as more comfortable to the body. Square knots, which was the dominant type of knots used was varied depending on the particular parts of the body that the garment was going to be used for. Big square knots were curved out at the hip areas. Difficulty in twisting of the twine especially the rubber twine was encountered due to their slippery nature. The sample made with nylon (fishing net and twine) slips and cannot sustain knots no matter how tight the researcher makes it. Joining was a little difficult. It could also entanglement easily.

Beads were used to secure the edges of the garment to prevent fraying based on the fact that, most of the yarns may unravel from the edges even after the garment production. Nylon yarn was very elastic; hence, garment made from it could be worn by women of different sizes. It was also fine and lustrous in nature which made the garment appear very smooth. The researcher observed that, easy entanglement occurred with the use of woollen yarn in the production of the sample. It also created accidental or unwanted knots during the process of knotting and it is easily friable. The researcher noted that, the garment made with this yarn was light in weight and moderately elastic. The challenges in relation to the cotton-polyester yarn were that, it entangles easily and difficult to join. Greybaft cotton twine was also difficult to join, not fine (not lustrous), very heavy and very difficult to unravel. Due to its thickness, less time was used to produce the garment. Easy fraying can be done even though it does not fray on its own. Bags were also made with the macramé technique to accessorize the garments produced.

5.2 Conclusion

Macramé is a textile art technique that is highly used in the production of accessories. This technique is used to produce accessories like bags and necklaces which have limited the scope of production and utilisation of the technique especially in Ghana. The extension of the scope of the macramé techniques to garment production will become beneficial to macramé artisans and for the study in Textiles. Different yarns in the market were used for the exploration and different and similar results were obtained in the various samples based on the particular yarns and the particular macramé knots used for the sample.

At the end of the study, it was concluded that macramé art technique can be used for the production of garments. This can be done using a various knots due to the different

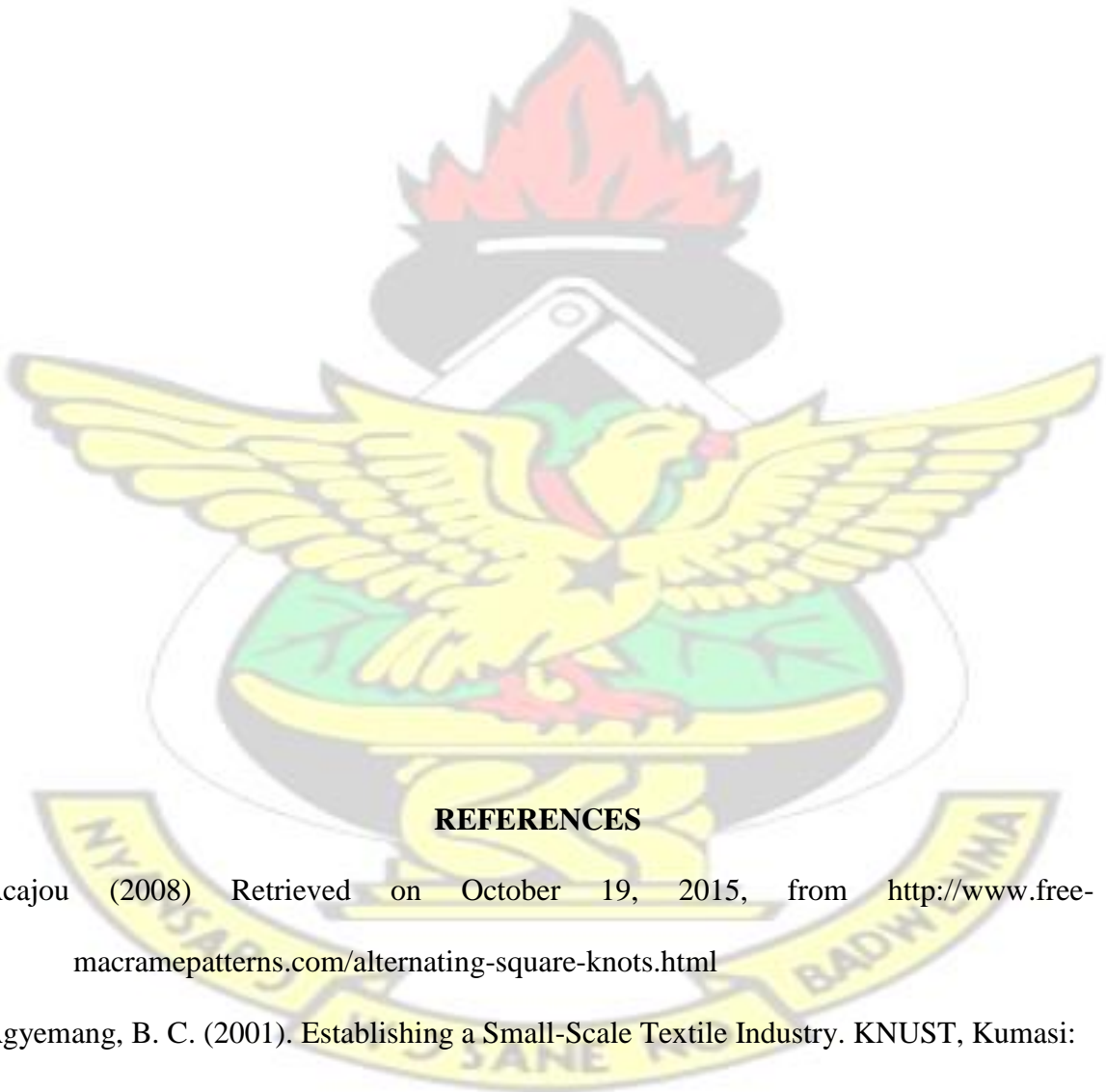
outcome of the macramé knots in combination with particular yarns. Some yarns frayed easily and reduced their suitability for the production of garments but for other items like accessories. Some yarns also coped well with particular types of knots.. Yarns like rubber twine exhibits slippery nature, hence makes it difficult in twisting during knotting.

5.3 Recommendations

From the study, the researcher recommends that:

- Other researchers should try macramé garments with available local yarns for men's garments
- Macramé technique should be used in the production of garments to bring variety in garments.
- From the researcher's experience, the choice of a particular macramé knot should consider the characteristics of the type of yarns to be used.
- Accessories should be used to secure the loose knots of garments produced with macramé technique.
- The edges of macramé garments should be allowed to fray rather than sewing the hem which may be bulky.
- The length of yarns used for the macramé garment should be extra longer than the measured length since some knots cause the yarns to reduce drastically.
- Other textile art techniques should be explored in the production of other items to expand their scope.
- With the usage of fishing net twine in the production of footwear, heat must be applied to enable the adhering of the yarn to the leather.

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