

UNIVERSITY OF EDUCATION, WINNEBA
COLLEGE OF TECHNOLOGY EDUCATION, KUMASI

**INNOVATIVE WEAVE STRUCTURES: INTEGRATING ASANTE KENTE
WEAVE DESIGNS INTO THE NORTHERN FUGU FABRIC WEAVES**

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Faculty of Vocational Education, submitted to the School of Graduate Studies,
University of Education, Winneba in partial fulfilment of the requirements for
award of Master of Philosophy (Fashion Design and Textiles) degree.**

AUGUST, 2022

DECLARATION

Student's Declaration

I, Atampugre Bernard, declare that this thesis, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

SIGNATURE:.....

DATE:.....

Supervisor's Declaration

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of thesis/dissertation/project as laid down by the University of Education, Winneba.

SUPERVISOR: MR. ISAAC ABRAHAM

Signature :.....

Date:.....

DEDICATION

This project work is dedicated to my parents, the late Mr. A. Atampugre, mother Mrs. Apoka Atampugre and my wife mis Atanga Patience who have been inspirational to me.



ACKNOWLEDGEMENT

This project work could not have been successful without the unfailing support of Mr. Isaac Abraham, who not only served as my project supervisor and mentor but also encouraged and challenged me throughout the entire project work. Thank you and may the Almighty God in his infinite goodness bless you abundantly and Mr. Cristopher Ncho a Lecturer at Bolgatanga Technical University, Mr. Isaac Gyasi Craftsman at Knust and to all fashion lecturers at the department of fashion design and textiles who in diverse ways lent their support before and during the study. I am much indebted to the assistance, kindness and hospitality accorded me by the weavers I visited to conduct interviews. I appreciate my dear wife Mrs. Atanga Patience for supporting me in my education at the tertiary level and for putting in so much effort.



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ABSTRACT

Ghana's traditions of weaving include the Kente, the fugu traditions as well as the kete. The Kente is identified as woven by the Asantes with other versions created by the Ewes in the Volta region (kete), while the fugu fabric is the work of some Northern ethnic groups. The traditional weaving is wide spread among many ethnic groups. The traditional weaving industry in Ghana is an example of such industry which has seen little change over a period of time. Some attempts have been made in the past to bring some changes to the traditions of weaving in Ghana. This project is an additional effort to suggest some changes to the way traditional weaving of the kente and the fugu fabrics are done by introducing an Innovative Weave Structure. This was done in order to contribute to the concept of national unity and cohesion which is continually being forged through academic discussions and socio-political media engagements. The project sought to, integrate the weave structures of Northern fugu fabric and the Ashante kente into a common weave structure. The approach of the study was qualitative research method and practice-based research approach, which is original research undertaken with a view to gaining new knowledge partly through practice and the results of that practice and instrument used to collect data were mainly interviewed (one-to-one) and participant observation with players in the traditional weaving industry and then some secondary data. The scope of the study covered selected indigenous weaving centres in the Ashanti and Upper East Regions of Ghana. The population of the study was limited to nine weaving centres in both regions mostly weavers from Bolgatanga craft village, Namoo, Yeliwungo, Bonwire, Adanwomase, Bepoase, Ntonso, Tewobabi and Wonoo. The concepts under investigation included research into various types of woven fabrics in the two regions that is kente and fugu fabrics. The findings of this study suggest that the researcher

found out that the incorporating of Kente design motifs into the fugu weave has been good, and the outcome of the cloth was relatively good as compared to the already woven of both the Kente and the fugu in the weaving industry.

It also emerged from this study that the traditional innovative weave produced under study, have the capability of uniting these two regions based on the concept the study.



CHAPTER ONE

INTRODUCTION

1.1 Overview

The chapter outlines and explain the background of the study, the statement of the problem, the objectives, the research questions that help address the objectives, the scope of the study and the importance of the study.

1.2 Background to the Study

The concept of innovative weave is not new, many experimented weave structures do exist. Lartey (2018) has researched into aspect of cross culture weaves in Ghana. She also explained the similarities and differences between the widely known traditional textiles of the country. Largely, Lartey's work forms part of the examples of looking at what could be developed from the already existing traditional weaves in Ghana. Other formulations such as the three-dimensional reinforcement structures open up innovative approaches by integrating functional features (Schindler, Bauder, Wolfrum, & Seibold, 2019). In that research, a three-dimensional shuttle weaving technology was taken advantage of to study carbon reinforcement structures with uninterrupted load trajectories from three points of view (Schindler et al., 2019). In Textile Engineering Science, innovative weave structures are often designed and produced for their structural strength low cost of production as well as to reap the full benefit of compositing (Akkerman & Haanappel, 2015; Gokarneshan, 2018). The main motives and results for these kinds of weaves are many and varied.

Weaving is a long-standing practice among some ethnic groups in Ghana. The practice has been going on for centuries. One would have expected that with the introduction of modernism and the advent of the industrial capitalism (Fulcher, 2004)

in the 17th Century, and the present extensions of capitalism even into the socio-cultural and political structure of Ghana, there would have been an introduction of high technology production techniques in textiles weaving of the traditional fabrics. However, this has not happened. Instead, the weaving industry has become a means of job creation and employment for the teeming youth and a means of promoting the industry of customised weaving or handcraft weaving. Due to this development, the traditional weaving industry is yet to receive the technological injection that will propel it to an advanced stage. Such developments are applied to any area of weaving in order to enhance the potentials of that area.

This project is designed to introduce the idea of blending two fabrics. This idea is borne out of the assumption that the various known traditionally woven fabrics could be blended together into a unique fabric, which incorporates design concepts from these fabrics. In this case the project is intending to merge concepts from some traditional designs from the Ashante Region and the Upper East Region. This is in reference to some fugu designs and kente, which are locally produced and have become internationally recognised.

For the integration of Fugu Fabric and Kente fabric, the weave is formed by the interlacement of warp (ends) and weft (picks or fillings) yarns, which interlace at right angles with each other according to the type of weave required. Korankye (2010) wrote that fabrics are made with at least two sets of interwoven yarns at right angles. Based on the usefulness of traditional fabrics in Ghana, experimentation for further development of new fabrics for local use could be desirable to the fashion world.

Traditional weaving, such as 'Fugu Fabric' and 'Kente,' are connected to Northern and Ashante royalty. Ashante and Ewe weavers' ceremonial materials on a local loom. The woven fabrics come in stripes on the loom and are sewn together after weaving to form a larger piece of material. These materials visually mirror the history of the ethnic groups that created these objects, ideology, morality, oral literature, religious belief, political thought, and aesthetic norms. These fabrics, although similarities exist in the nature of the techniques used for weaving, patterns vary depending on the area of Ghana from which it is manufactured.

The integration of the two traditional forms of weaving will generate a third form of fabric first for aesthetic reasons, but more importantly to contribute to the concept of cultural integration or syncretism as outlined in Ezenwake and Kanu (2012). Ezenwake and Kanu (2012), indicate that the word “syncretism” originates from the Greek word synkretismos. They also stress that the word comes from the people who lived in the Island of Crete in ancient times. These people used to fight each other, but each time an enemy or external enemies attacked them, they combined their forces to confront them. The people of the Island so called the practice synkretismos, which comes from the word “to combine”.

Integration of cultural artifacts is likely the basis for discussing cultural integration as declared by Lartey (2018). Incorporating different traditional weaving styles will provide an opportunity for the integrate woven strips from the regions into fabric production. Successful research would ensure the development of an integrated regional approach (Lartey, 2018). Social integration campaigns foster interactions beyond the limits of class, ethnicity, religion, and national origin (Kuran & Sandhold,

2008). The manner in which the many traditional Ghanaian weavings have been adopted across cultural borders is sufficient evidence that cultural convergence occurs in variety of ways. (Lartey, 2014). This happens mainly at the individual level. Danchev (2008) argues that people's enrichment through the consumption of cultural goods from other cultures leads to a change in their habits. Such a behaviour of the consumer can be explained better by means of so-called endogenous preferences defined as preferences which cannot be taken for granted, but which are influenced by individual internal responses to the external situation (Danchev, 2008). Cultural integration is used in this sense as an idiom that can be likened to merging two or more cultural weaves into a single identifiable fabric.

According to Korankye (2010), weaving consists of two sets of interlaced yarns to form a fabric. He describes the Kente loom and shows its parts as well as the process of weaving. In view of the nature of the two looms (the broadloom and the kente loom), it can be inferred that the broadloom produces wider fabric than the narrow loom. The two regions selected for the research, use the same narrow loom in weaving. This is part of the reasons that make it possible to integrate the two weaving techniques.

The yarns are prepared by setting the warp in place, this ensures that the loom goes through the primary principles of weaving, such as shedding, picking, beating-up and letting-off (Asmah, 2014).

Kente, an elegant multi-coloured fabric from Ghana, is considered one of the best textiles and art expressions in Africa. It is regarded as the most complex weavings in the world (Thirumurugan & Nevetha, 2019). The authentic kente fabric is

manufactured by Ewes and Ashante weavers from Ghana. This type of fabric is special as it is worn as a piece of apparel by the Akan people on special occasions. According to Howard, Sarpong and Amankwah (2012), just as many african woven fabric come with meaning to their patterns and designs so each pattern design or symbol on the kente cloth has a name and a special meaning assigned to it.

Kente is sometimes said to have originated in the 12th century, but the exact date is unknown. In the past, royalty and prominent personalities of society wore these garments for very special occasions (Micots, 2017; Lloyd, 2017). Among the Asantes, the inhabitants of Bonwire are famous for weaving kente. Traditionally, men have been known for art, while women have primarily assisted in the commercialization of fabrics (Micots, 2017).

Semantically, a Fante word for a weave is “kenten” (n) which also means a “basket” (Frimpong & Asinyo, 2013; Avins & Quick, n.d). weavers first produce what are called ‘horizontal narrow strips’, then sew several of these bands in the desired dimensions of fabric intended for use by women or men (Okyerere, 2017).

The meaning of kente, for many Ghanaians, goes beyond its visual aesthetic appeal and is also oriented towards its integration of symbolic concepts (Boateng, 2011). It is called "the communicating power of fabric" (Boateng, 2011). “Kente Cloth Colours refer to specific meanings in the same way as Adinkra Symbols and Kente Cloth Weave motifs have special meanings” (Lloyd, 2017). Kente is also a tool for the articulation of social and cultural buildings and codes of power, family, community and political unity (Ayiku, 1998). Thus, the traditional marking of clothes motifs with

specific names and proverbs with abstract metaphors enables clothes to be picked and matched to the social status or size of the political power of rulers, mothers of the queen, Ghanaian leaders, and other men and wives (Akwetey, 2007). Fugu fabric and Kente are therefore, Ghana's most common body adorning garment, during facilities and ceremonies for the swearing-in of Ghanaian kings, chiefs or queen, and sometimes presidential swearing-in's (Lartey , 2014; Essel, 2015).

According to Dor (2014) and Lloyd (2017), kente is also one of Ghanaians ' most respected political giveaways to foreign leaders and other leaders of world-renowned organisations. Kente is therefore no longer the exclusive monopoly of the rich. It now acts as both an articulated energy index for the wealthy and as an instrument of independence for Ghanaians with lower economic benefits.

It is now both an articulated energy index of the rich and an instrument of independence for Ghanaians with lower economic benefits. As a matter of fact, kente means different things for different people. For example, Dor (2014) indicates that it is common practice for an Ewe weaver to weave a cloth called “sasa”, which literally suggests how a couple’s love has been strongly tied up or intertwined, as a special gift and expression of gratitude to his wife for keeping her fidelity and providing the family the needed support.

Fugu is also an exclusive brand in Ghana, which is fully hand-woven and originates from the Northern Regions. The fugu is produced in numerous cities in Northern Ghana but most of its commercial activity focuses on the northern, the Upper East and the North-Western Regions of Tamale, Bolgatanga and Wa. In the smaller villages of

Yendi, Daboya, and many others, there are also tried-and-true fugu activities in the three northern regions. Historically, the fugu industry, which is dominated by women weavers, provides Northerners with traditional apparel (Tettehfiio, 2009).

Fugu has traditionally been used in northern Ghana as a traditional garment, but now has been dedicated to the whole country and worldwide. Leaders and bosses in northern Ghana traditionally wear fugus. It has also used on special occasions like festivals and as casual wears. Fugu is a designer garment worn by ordinary men, women and children in Ghana and elsewhere (Adu-Agyem & Ross 2008).

The fugus in the north of Ghana are pure cotton. Textiles of all countries and each cultures have their own textiles that make them unique (Bhangtana, 2009). The blouse is largely white, has coloured bands of different types, and is not as complex as the "Kente" of Southern Ghana. This is attributed to indigenous knowledge of the relevance of colours as white colour reflects the sun's rays to limit the heat generated. The use of white was therefore a measure to reassure users in the warm climate savannah in Ghana. The colours mainly used or mixed with white include blue, black and white with an occasional selection of green, red, purple, yellow and brown.

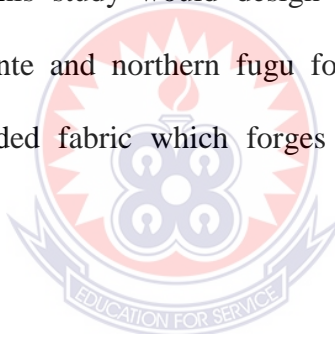
The colours commonly seen in the fabric "Fugu" are formed by the warping pattern of the fabric with white being the predominance. This is due to the indigenous awareness of the importance of colour, since the white colour reflects the sun's rays in order to reduce the heat generated (Tettehfiio, 2009; Abdulai, Mohammed, & Kwadwo, 2016). Colours generally mixed with white include blue, black and white, and sometimes green and red, violet, yellow and brown (Tettehfiio, 2009).

However, modern requirements widen the choice of colour to cover almost every possible user preference. Fugus have names that distinguish one cloth from another, like the one that prevails in many other traditional textiles. Names of the various colour combinations are assigned (Tettehfiio, 2009).

The most popular model is the guinea fowl model that is made of a mixture model white and grey or ash. Tettehfiio (2009) notes that, besides the guinea fowl pattern popularly known in various ethnic dialects under the name of “kpankobri”, other patterns include: “tupal-zie”, “kutorfa”, “bon-zie”, “VIP”, “bon-sabinli”, “cedi”, “tupal-sabinli”, “sanda”. The most popular also include “alkila”, “abin makorla”, “obarko”, “minister”, “Angelina” and many others. Many other designs and models exist that this study cannot exhaust. The chosen names are chosen according to the colour combinations, the reason or purpose of the production, the objects, the names of the people and sometimes the nature of the use. Individual weavers sometimes give their preferred names to designs developed as they see fit (Chivivi, Painos, & Nyasha, 2014).

The fugu garments are also woven in different styles and lengths with each having its distinctive name. Some of the types include; “banaga” (short fugu with sleeves), “dansiki” (short fugu without sleeves) and “kutunbi” (long outer fugu with long sleeves). Long outer fugu (kutunbi) with long sleeves, short sleeveless inner fugu (dansiki), trousers, and hat are also made as “kutunbi suit” (long outer fugu (kutunbi) with long sleeves, short sleeveless inner fugu (dansiki), trousers, and hat). In certain cases, a fugu is worn with kpakoto, or matching shorts. (Chivivi et al., 2014).

Ghana, as a nation, consists of 16 regions. It has a flag and an anthem that strengthen national unity as shown in symbols and colours of the nation's flag and emblem. The characteristic traits of the national flag and the national anthem are embraced and identified by all to ensure unity among the peoples. The researcher believes that this same ideology of unification through the use of artifacts and symbols could be reproduced with these traditional weaves to achieve similar goals. The two fabrics are basically "Fugu fabric" from the Northern Regions of Ghana, and "Kente" from the Ashante Region of Ghana. Their unique characteristics portrayed in design elements such as colour, motifs and philosophy, which are peculiar to each region where they are produced, have the potential, when integrated effectively, to bring these regions together conceptually. This study would design a common weave structure that combines the Asante kente and northern fugu for the purpose of developing the concept of a third blended fabric which forges the ideals of unity, or cultures syncretism.



1.3 Statement of the Problem

Ghana's rich and most cherished weaving cloths include the Kente and the fugu as well as the kete. The Kente is woven by the Asantes with the other versions created by the Ewes in the Volta Region (kete), and the fugu fabric produced by some Northern ethnic groups. The tradition of fugu fabric weaving is widespread among many ethnic groups located in the Northern part of Ghana, including but not limited to Daboya, Yendi, Wa, Bolgatanga, Pulmankong, Garu and Bawku. Kente from the Ashante and kete from the Ewe land have undergone numerous changes in the name to enhance its beauty and qualities. A lot has been documented on Kente and kete and their methods of production. The researcher is of the view that, much is not known

about fugu fabric weaving. Traditional textile producers are undergoing changes in their weaving structures to enhance the survival of the industry but little is being done about fugu fabric woven structures. So far, there has been no change towards improving fugu-weaving techniques. This study addresses the lack of research by exploring this traditional textile industry by integrating Kente motifs woven structures.

1.4 Purpose of the study

The purpose of the study is to produce a traditional woven fabric by integrating Kente-weaving design techniques into fugu weave.

1.5 Objective of the Study

The specific objectives are to:

1. Identify the weave structures of the Northern fugu fabric and the Ashante Kente of Ghana
2. Integrate the weave structures of Northern fugu fabric and the Ashante Kente into a common weave structure.
3. Evaluate the innovative weave structures to determine the level of acceptance.

1.6 Research Questions

Based on the stated objectives, the following research questions will help to provide the right answers:

1. What are the weave structures of the Northern fugu fabric and Ashante Kente?

2. How can the weave structures of Northern fugu fabric and Ashante Kente be integrated into a common weave structure?
3. What is the level of acceptance of the innovative weave structure, produced?

1.7 Scope of the Study

This study was limited to fugu and Kente weaving techniques in the Upper East Region and the Ashante region of Ghana. It was limited to the use of traditional looms and broadlooms in Ghana. Geographically the study was also limited to Adanwomase, Bonwire, Bepoase Ntonso, Wonoo, Tewobabi and Bolgatanga craft village, Namoo, Yeliwungo weaving communities in Upper East Region and Ashante Region of Ghana.

1.8 Significance of the Study

The study takes a critical look at the two different weaves (Ashante kente and the Bolgatanga fugu fabric and the benefits that will result from the blending of their weaving structure.

The creation of the innovative weave structure could provide a third fabric structure for the nation as a blended design from two different cultural settings. The study will help textiles designers to produce a common weave structure from Northern fugu weave and Asante kente weave designs.

The study is essential, and the findings shall benefit academia and research by contributing to the body of literature on designing a common weave structure from Bolgatanga fugu fabric and Asante kente. It will also add to the body of knowledge within the textiles industry.

The study will provide design options for the local textile industry.

The study seeks to encourage the breaking of traditional weaving boundaries thereby allowing for the fusion of different weaving techniques into the traditionally known weave structures. This will help to forge national unity and cohesion. This will bring innovation and diversity into the fugu weaving industry in Ghana. It will also be a body of knowledge that will serve as reference for other researchers on fugu weaving in Ghana.

1.9 Definition of Terms

Fugu fabric (also known in Bolgatanga as, “motane”): This refers to the traditional woven fabrics produced by the people of the Northern Regions of Ghana. More specifically; the Savannah, Northern, North East, Upper East and the Upper West Regions of Ghana (Tettehfiio, 2009).

Fugu / fugu: Fugu or Fugu may be used interchangeably. The term is used specifically to refer to traditionally woven fabric in the northern parts of Ghana and hand-sewn or machine tailored men’s garments. The modern usage includes female garments sewn from the same northern fabrics.

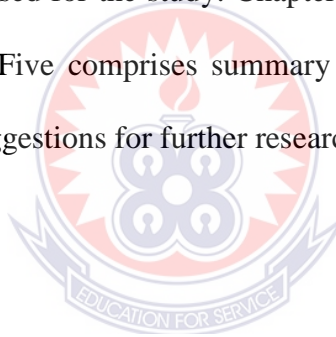
Integration / blend / syncretism: in this project, the concept of integration refers to the blending or fusing two or more cultural techniques of weaving. The concept refers to fusion techniques, symbols, colours etc. embedded in the traditional weaving of Northern Fugu fabric and Asante’s kente.

Kente fabric: The kente fabric refers to the traditional weaving of the Asante people of Ghana. The traditional weaving of the kente is predominantly done by the men of the town of Bonwire. There are however other places in the Ashante Region where the weaving tradition is also practiced.

Stripe designs / linear designs: stripe designs are traditionally woven fabrics using the warp and weft interlace. The colours are aligned linearly on the fabric interface (vertically or horizontally). This technique is typical of the Northern fugu fabric.

1.10 Organisation of the Study

The entire research is organized into five parts and the outline of each chapter is given as follows: Chapter One discusses the background to the study, statement of the problem, objective of the study, research question, scope of the study, significance of the study and organisation of the study. Chapter Two reviews literature from relevant textbooks, journals, websites and other referenced sources. Chapter Three covers the research methodologies used for the study. Chapter four is the presentation of results and discussion. Chapter Five comprises summary of the research, conclusions and recommendations and suggestions for further research.



CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Overview

This chapter looks at the theories that form the basis for the practice as well as the construction of the existing literature on the research topic and its related areas. The specific areas are the history of weaving, selected study regions in retrospect, cultural similarities of the study regions, elements of weave structures, types of looms, weaving techniques, materials and tools for weaving in Ghana, traditional and contemporary weaving in Ghana, theories of weaving, design of weave structures of Northern and Ashante weave, theories of integration as well as the possibility of fabric integration.

2.2 History of Weaving

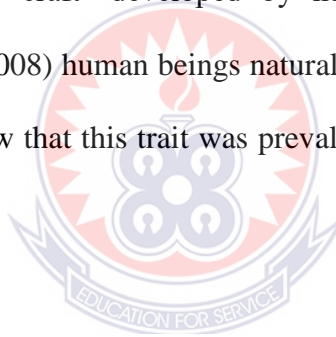
The tradition of weaving has existed from ancient times with various types of textiles being manufactured in different parts of the world for practical purposes (Ebert et al., 2016). Ebert, et al (2016) again noted that the true source of weaving is uncertain, but ancient Greek and Egyptian records show that simple looms were used in these communities for weaving. It explains that a warp suspended from a top bar was used for early weaving and weighed at the bottom. Kindersley (2015) discusses the Scandinavian roots of a crooked rug, which most people think is distinctly an American craft.

Many of the rugs dating back to 200 B.C. which were discovered were created by connecting short sisal fibre spans to the warp threads in a weave to create a pile effect.

According to Kindersley (2015), the Chinese, Egyptian and Mayans were responsible for the invention of this method for the development of woven teapots.

Our prehistoric ancestors' probably through the need move outdoors for food began to look for means of protecting themselves from the harsh weather led them to the interlacing of twigs or vines, which resulted in netting that probably assisted humans in catching fish and trapping game. Eventually, people used weaving skills to make exterior coverings for shelters so they would be somewhat protected from harsh weather (Fiadzo, 2010).

According to De Late, (1994) "archaeologists believe that basket making and weaving were probably the first 'craft' developed by humans. According to Sherwood, Subiaul, and Zawidzki (2008) human beings naturally have a strong compulsion to be creative, and records show that this trait was prevalent in human beings thousands of years ago.



Sherwood, Subiaul, and Zawidzki (2008) indicates that primitive looms and web-making methods are found on all continents and studies indicate that the looms constructed and weaving created were very much like what we have today. Today's researchers are able to give a precise date due to radiocarbon analysis and DNA testing (Taylor, 2000). Nevertheless, the exact date of the first hand-woven fabric is still a mystery (Taylor, 2000).

In Mesopotamia in Turkey, there is evidence from 7000 to 8000 BC, that clothes were made (NCERT, n.d). Some historians use other sources as guides in piecing together our textile heritage. One valued artefact is the funerary model of a weaver's

workshop, which was found in an Egyptian tomb (Fiadzo, 2010). This model contains a horizontal loom, warping devices and other tools, and weavers in action (University College of London, 2003).

The printing of a textile structure on its exterior is another artefact that is highly valued. The British Museum offers Neolithic potteries with tissue imprint found in the Thames near Mort Lake, England (Wendrich & Holdaway, 2018).

According to Kindersley (2015), the weavers use threads woven out of natural fibres such as cotton, silk and wool and synthetic nylon and ray fibres. Men used tissue with natural grasses, leafstalk, palm leaves and thin strips of timber for thousands of years.

Kindersley (2015) asserts that the techniques of making ropes are consistent with those used for making ready woven base such as linens through working yarns or strips of the fabric. The six styles of rugs making include a straight hook, lock hook rug, punch hook rug and hook rug. The rug is in two wide ranges: crochet and needle manufactured.

The technique of transformation incorporates elements from a number of styles, making traditional weaving easy to use. The generic styles are often used as entertaining and more intimate strategies rather than being practised slavishly (Lartey, 2018; Frimpong & Asinyo, 2013).

Lartey (2018) says the weaving of two or more component sets, typically, but not always, is systematic. Artefacts such as kente cloth, pot, bead, screens, shoes, and

bags are explained. Decorative objects can be crafted from various types of materials. It is recognized from this definition that artefacts are present in the African environment.

The final products of the experimental project are regarded as artefacts in connection with regards to this project. Many decorative items for occasional and ceremonial wears, could be made. Other items designed for churches, meeting places, living areas, recreational areas, houses, dormitory areas and a vast number of other sites can also be made. The weaves could also be applied for all types of fabric hangings, such as curtains, lampshades, fuzzy ball, photo, and frames (Ansong, 2012).

The Kente weaving techniques known as strip weaving (Adu-Agyem & Ross, 2008; Fiadzo, 2010; Lartey, 2018), is an indigenous Ghanaian art form which is a means to create narrow textiles weaves, including belts, bands and trims, and which is regulated by strict gender policy. The majority of woven bands are very strong and durable. The oldest known proof of card weaving comes from approximately 400 B.C. In northern Europa, especially in Scandinavia (Walton Rogers, 1997; MacDonald, 2017).

According to Smith (2016), not written but taught in their hands, especially within their families and communities, is the most important legacy for basket weavers, carvers and workers in plant material. We should learn more about and place them in a written form from our community.

Akdemir and Akdemir, (2016) states that the experience has taught him that people are born in our environments with instincts and senses to assist the processing of information. His style of teaching was to promote this development. Therefore,

constant imitation and practice contribute to the confidence required for independent thought and creativity.

Everyone who lives today is a descendant of an ancient hunters 'and rammers' culture. When modern technologies impact our culture, lifestyles and values, it is essential to understand our connection to a place to practice pre-historical technologies derived from our traditional ecological awareness (Lambertini, 2018; Cairns, 1996). This implies that teaching the discipline of natural fibre weaving can serve to strengthen each student's own cultural awareness, appreciation, and pride (Lambertini, 2018).

Hugo (1984) indicates that through history, natural fabrics have long since been made into clothing from animal and plant fibres.

Since the day synthetic fibres were introduced into the needle world, a plethora of fibre weaving technologies has been developed. Since then, a few important improvements have been made and the adding of the latest computer technologies is one of them (Fiadzo, 2010)

2.3 The Study Regions

2.3.1 Upper East Region

The Upper East Region is situated in the north-eastern corner of Ghana, bounded on the north by the Republic of Burkina Faso, in the west by Upper West Region, in the south by the North East Region and in the east by the Republic of Togo (Akomeah, Odai, Annor, Adjei, & Barry, 2009). See figure. 2.1. The region is located between longitude 00 and 10 west and latitudes 10° 30' N and 11°N (Ashaley, n.d). The

region lies in the Sudan savannah belt and is relatively flat with a few hills to the East (Modern Ghana, 2020; Blench, 2006).

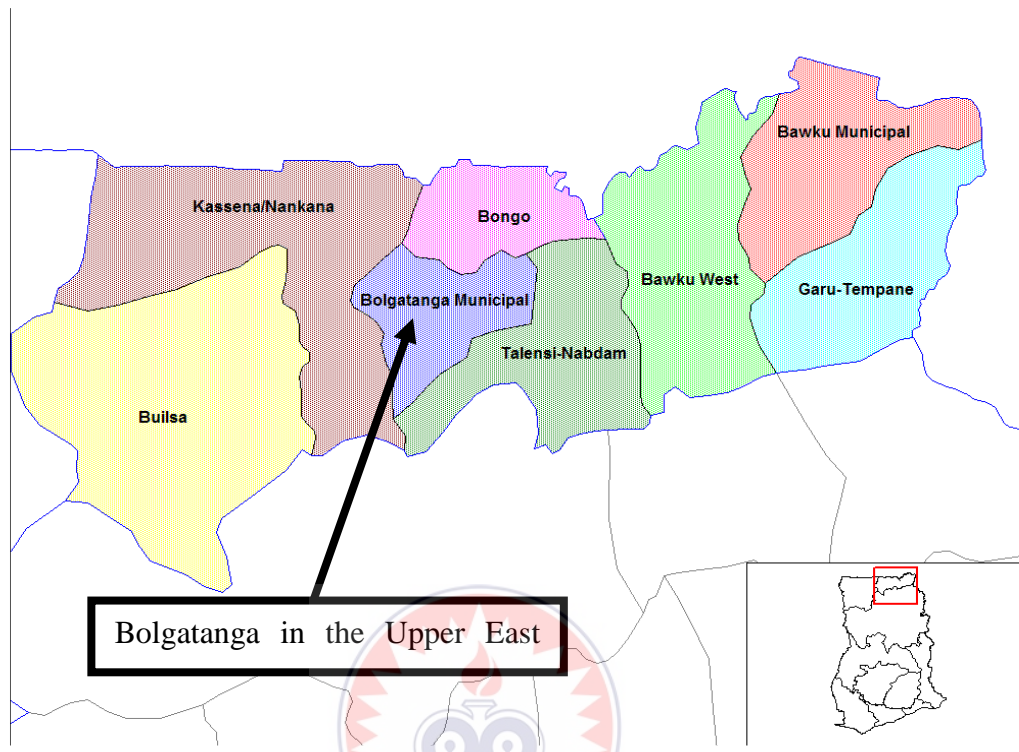


Figure 2.1 Map of the Upper East Region

(Source: <https://w.google.com/search>)

This is strikingly high for a Savannah region with erratic rainfall although it does not approach the high-density zones in the humid forest. The area's physical geography is distinguished by the Gambaga escarpment line running west to east along its southern edge and defining a higher-rainfall division with lower density, largely part of the northern region (Gyarteng, 2008).

The climate of the region is relatively dry, with a single rainy season beginning in May and ends in October (Nicholson, Funk, & Fink, 2018). The dry season runs from November to March / April with maximum temperatures around the end of the dry

season (March-April) and minimum temperatures between December and February (Nicholson , Funk, & Fink, 2018).

In Ghana, the conventional fugu weaving was the preserve of the country's north, an art skill passed down from generations. This art of weaving has gained recognition in places such as Daboya, Yendi, Tamale, Paga, Bawku, Wa, and Bolgatanga, with notable color significance and naming characteristic features (Seidu, Howard, & Asinyo, 2017; Fusheini, Adu-Agyem, & Appau, 2019).

2.3.2 Ashante Region

According to Frimpong and Asinyo (2013), Ashante Region is located in the middle belt of Ghana. It shares boundaries with the Brong Ahafo Region in the north, Eastern region in the east, the Central region in the south-west and the Western Region in the Southwest. It occupies a total land area of 24,390 square kilometres. See map in Figure 2.2. Ashante Region, apart from being the cultural heartbeat of Ghana, is also the land of the Golden Stool.

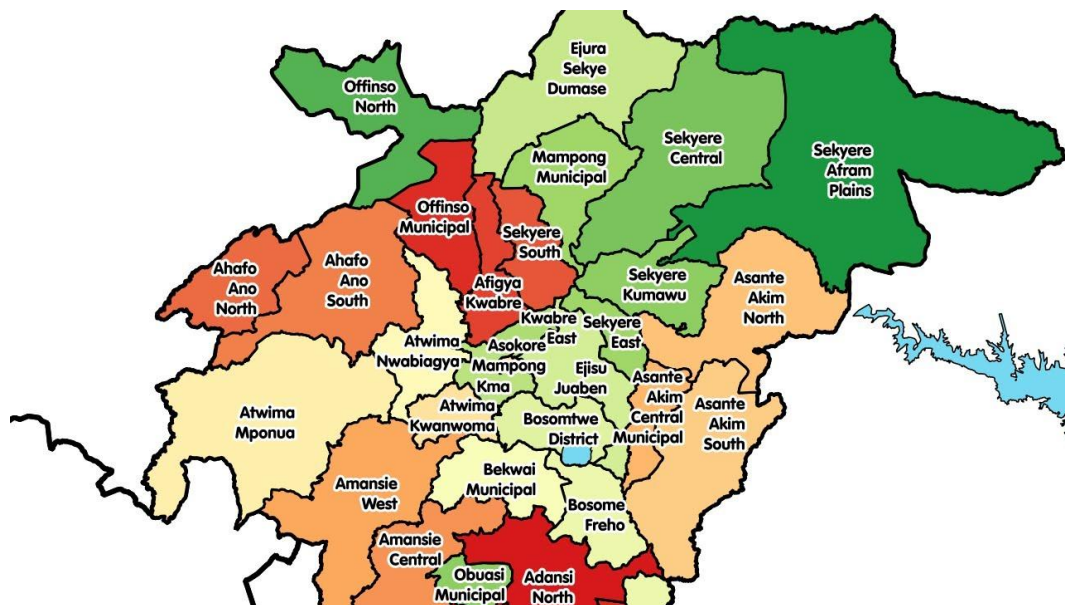


Figure 2.2: The Map of Ashante Region
(Source: <https://w.google.com/search>)

The region has a rich culture that is often expressed in the language, passage rites, festivals, and funerals, naming ceremonies, cuisine and day to day activities of the people with Twi as the main language spoken in the region. The hilly region is a vast tropical rain forest belt with impressive buttress rooted forest and large cocoa farms. Ashante's are very particular about their festivals which are celebrated to remember past leaders and heroes (Lartey, 2018). Although these past leaders are dead, their spirits are meant to be alive and take an interest in the affairs of the living, watch their actions and consult them (Frimpong & Asinyo, 2013). Major festivals celebrated are "Akwasidae" and "Aday-Kese". These Festivals are a platform for pledging allegiance to the kingdom and to affirm loyalty to the occupant of the Golden Stool which represents the unity and the embodiment of all Asantes (Dekumwine, 2012).

Other festivals celebrated are 'Papa' Festival that reminds chiefs and people of Kumawu of the bravery of their ancestors. A 'Kente' Festival is celebrated to commemorate the origin of the "Kente" cloth in Bonwire, over 300 years ago. There is also a 'time-Ni-Nko' Festival which celebrates the bravery and wisdom of Nana Wiafe Akenten I (Frimpong & Asinyo, 2013).

According to Browne, (2013). Ashante Region is noted for its numerous and beautiful tourist centres such as George Ferguson's Tomb, Komfo Anokye Sword, among others. Others are the "Bobiri" Forest, Butterfly Sanctuary, "Bomfobiri" Wildlife Sanctuary and "Digya" National Park.

2.4 Cultural Similarities of the Study Regions

"Fugu fabric" and "kente fabric" are hand-woven fabrics inherited culturally from one generation to the next and transmitted as an inheritance within the family. The

patterns and motifs acquire names and meanings from past events, individual achievements, proverbs, philosophical concepts, oral literature, moral values, social code of ethics, human nature and certain attributes of animals and plants (Browne, 2013). The two types of traditional cloths are in essence part of their respective cultures and celebrated by the regions as seen in their funerals, rites of passage and festivals (Akwetey, 2007).

Festivals are celebrated too, among other things, to take stock of the past year's activities whilst development plans are initiated to foster unity among the people and to mobilize resources for development purposes. It is also organised to pay homage to the chief. As part of the celebrations, the two traditional cloths aforementioned, play a critical role as it is used to decorate and adore the Kings and Queens (Akwetey, 2007).



Northerners and Ashantes weave traditional cloths as part of their heritage. The cloth is a store of knowledge and skills inherited from the weaving cycle. The weaves are produced on a traditional loom in the form of narrow stripes (Frimpong & Asinyo, 2013; Amissah & Afram, 2018).

2.5 Differences in the weaving of Fugu fabrics and Kente

There are two main types of yarns that are used to weave the hand-woven cloth from Northern region of Ghana. They are yarns spun by hand, and yarns spun by machine. Cloth from hand-spun yarns is mostly used to bury princesses (Ahmed, 2018; Lartey, 2018). This is a kind of respect that is given to them for their positions as titled women while they were alive and to bid them farewell.

Traditional woven cloth is used in the Ashante region to cover the casket, as it were, to say farewell to the chiefs and the affluent when they die. After all ceremonies this cloth is stripped before the burial (Lartey, 2018).

2.6 Elements of weave structures

2.6.1 Yarns

Yarn are important factor in the creation of blended cultural weaves in Ghana. The yarn is a twist of fibre made of natural or synthetic fibres suitable for textile production, sewing, weaving, and cable production. The yarn is made with a long continuous length (Amissah & Afram, 2018; Lartey, 2018).

Korankye (2010) has described the fibres from which yarns are produced, as the raw material used for the production of textile yarns and fabric. He also explains that fibre is a hair-like strand with a small diameter compared with its length. Fibre is usually defined as a natural or man-made unit of matter that forms the basic elements of textile fabric and other textile structures (Lartey, 2014). In addition, fibres are defined as units of matter which are at least 100 times their diameter or width in length and which can be spun into yarns or made into fabrics and gave the diameter of textile fibres as 0.0004 – 0.002 inch (in), or 11 – 50 Micrometre (μm) (Lartey, 2014). The length ranges from 7/8 inches to several miles, or 2.2 centimetres. The researcher will be able to classify which yarn to use for the research using this knowledge.

2.6.2 Cotton

The word 'Cotton' comes from the Arabic word 'Al Qatan.' Nobody knows how old this cotton plant is. One of the first archaeology finds of the cotton usage in the world

is located in Pakistan at Mohenjo Daro. This site is over 5,000 years old (Chaudhry & Guitchounts, 2003; Lartey R. L., 2014).

A cotton plant grows in moderately hot climates all over the world. There are over 50 species that produce different qualities of cotton (Muhammad & Muhammad, 2010).

India produces more cotton than any other country, but the quality of their cotton is quite debatable (Menon, 2019; Dasgupta, 2017; Gururajan, 2007). Extra-long Staple (ELS) cotton is produced in Egypt and the United States of America (Gururajan, 2007).

Part from the length of the cotton, the thickness of cotton is equally important (Menon, 2019; Gururajan, 2007).

Cotton is grown in the interior and coastal savannah zones of Ghana but not on an extensive scale (Wayo Seini & Nyanteng, 2003; Adjei-Nsiah, 2006). These include the Northern region down to Hohoe in the Volta region, around the Accra plains in the Greater Accra region. Ghana's cotton-growing regions are the Ashante region around Ejura, Techiman and Wenchi in the Brong-Ahafo region and some portions of the Upper East and West Regions (Adjei-Nsiah, 2006). Adjei-Nsiah (2006) also indicates that the Northern and Upper Regions lead in cotton production in Ghana. Based on the analysis given, if regarded to support the textile industries in Ghana, cotton cultivation could be all-encompassing in Ghana and West Africa.

(Lord, 2003) describes how to separate burrs, sticks, crushed leaves and other dirt mixed with fibres, after which the raw cotton is sent to the industrial ginning machine where the lint is separated from the seeds. Lord (2003) again gives the manufacturing processes at the mill as opening and picking, carding, combing and spinning, after

which yarns would then be formed and ready to weave. The cycle explains why certain characters have cotton yarns.

Cimilli et al., (2009) describes four types of yarns, and these are Spun, filament, compound and fancy. The spun yarn is explained as continuing strands of fibres held together by a binding mechanism. Ring spun consists of fibres which are equally aligned with the yarn orientation. Open-end spun are those in which the yarn axis appears to be less well aligned. The filament is handled as a yarn consisting of continuous filaments attached with or without twisting (Wilson, 2011; Das & Alagirusamy, 2010).

Cotton yarn characteristics may be defined by fibre origin. Corbman (2010) notes that Cotton fibres' resilience is determined by their ability to withstand the strain or pressure of being pulled, stretched or pressed.

Cotton yarns absorb water and respire. It is hydrophilic in nature and the ease and extent to which water can penetrate its hydrophilic character. Once its finishing procedure breaks down the outer defensive cuticle, it becomes highly absorbent (Wartell, Kleinman, & Huey, 1999). Corbman (2010) discusses also the elasticity of the yarns, which implies how the yarns lengthen and return to their normal state. Corbman sees resilience as the degree to which yarns can be compressed or crushed and returned to their initial position. Cotton attracts dirt particles due to its roughness, but this can be washed off easily either by boiling or using a strong detergent. Cotton yarn does not react to the bleaching agent when used appropriately.

The project uses cotton yarns spun from natural fibre because it absorbs moisture easily due to the fluffy nature of the fibre. According to Picton & Mack, (2007), cotton yarn is spun from the mass of fibres surrounding the seeds of the cotton plant of which there are several species of the genus *Gossypium*. They further indicated that until the eleventh century AD little was known about the cultivation or use of cotton in Africa. There is evidence to show that Egypt, the United States, India, Brazil, the West Coast of Africa, West India, the USSR and China were the principal cotton-growing areas in the world (Cheru & Obi, 2010).

2.7 Materials for weaving in Ghana

The various materials used in indigenous weaving techniques for various artefacts in Ghana are discussed as follows:

2.7.1 Grasses and sedges

Baah (2010) discusses the use of guinea grass and rushes as plants that provide raw materials for developing creativity in schools and colleges in Ghana. He states that guinea grass is used for making hats, bags and baskets. He also states that cyperus reed (*Cyperus articulatus*) that is found growing in marshy plains in the coastal parts of Ghana is a useful material for making mats. Baah, (2010) also explains that guinea grass stalks are twisted by local Ghanaian craftsmen to render the otherwise brittle stalks pliable. After this twisting, the stalks are used for making shopping baskets, hats and fans.

2.7.2 Banana and Plantain Fibre

Subagyo and Chafidz (2018) mentions the use of the stem of both banana and plantain yields a fibre that is used in West Africa for fishing tackle, and in the then Gold Coast as a sort of sponge. Baah (2010) states that the fruit peduncle of the banana and plantain plants are beaten, dried and plaited into long strips used in weaving baskets, and for making articles such as fans and mats.

2.7.3 Sisal and Pineapple Fibre

Baah (2010) mentions sisal and pineapple leaves as sources of fibre for rope making. Asmah (2009) describes sisal as an excellent cordage fibre used in the manufacture of all kinds of ropes, twines and ship cables. He also demonstrates sisal as a substitute material for rug weaving. Sottie (2009) describes sisal fibre as one of the most valuable of all cordage because of its strength, ability to stretch and good affinity for dyes. He states further that it is used in the production of fancy hats and bags, as well as doormats and brushes.

2.7.4 Shucks from Corn

Corn shucks do not leave in the usual manner. They are defensive calyx changed and covers the corncob. Corn shucks are used as food wrappers and to make mats and cloths. Dried corn shucks for weaving bags, doormats, hats and boots can be quickly dyed and tiled into a rope (Fiadzo, 2010).

2.7.5 Bast Fibre

The bast fibre plants roselle, kenaf and Congo jute and a variety of roselle (*Hibiscus sabdariffa* var, *altissima*) are grown for its fibre. Dalzeil (2010) states that Kenaf is

comparable to jute and can be used for the same purposes such as tying the rafters used for roof binding, for plaited ropes, hobble ropes, fishing lines, and women's coiffure. He indicates that Congo jute is suitable for cordage, sacking, hammocks, fishing ropes and fishing tackle (Fiadzo, 2010). Danso (2007) mentions the use of the kenaf fibre as a substitute for jute in the manufacture of twine, carpet, yarn and baskets. Subagyo and Chafidz (2018) list roselle, kenaf and congo jute as plants that yield bast fibre.

2.7.6 Palm Trees

Osei (2011) mentions the oil palm leaves as a source of raw material for basketry. Irvine (2011) as cited in Baah (2010) states that raffia, a leaf bast of raffia palm, is used for weaving cloth, hats, hoods, and bags, as well as for making ropes and ceremonial aprons. It is also confirmed that the branches are cut up and used in weaving mats. According to Baah (2010), coconut coir, obtained from the coconuts palm, is used for making carpets, brushes and ropes, the leaves of the fan palm provide the raw material for weaving mats, bags, hats and ropes.

2.7.7 Rattan and Soft Cane

The commonest use of the rattan palm is basketry. However, differentiation may be made between two kinds of basketry produced from these canes; heavy-duty and light, fancy basketry. Soft cane stems are prepared for use by drying them in the sun and often dyeing them for mat making. It is also employed in weaving fish traps and in basketry (How Things are Made, 2020).

As can be seen from the discussion, raw materials for weaving different artefacts abound in Ghana, and art teachers can tap these to teach weaving and other textiles techniques. Since they are widely used across the country for various purposes, nothing stops Art tutors in Ghana from adapting these and other resources for effective teaching of textiles so that their students can become versatile teachers of art in the schools they would teach in. This also shows the availability of weaving techniques used to apply to various materials for artefacts of various uses.

2.8 Weaving Tools

1. **Swing needle:** This helps to split guinea grass stalks, for stitching and sewing.
2. **Cutlass or machete:** This is a handy household tool for heavy cutting. It is useful when fetching raw materials from the bush and when cutting up hard or heavy raw materials.
3. **Jack-knife, kitchen knife, a paring knife or utility knife:** This is generally useful in cutting up materials to the required sizes and shapes.
4. **A pair of scissors:** This is handy for light cutting and clipping.
5. **A pair of round-nosed pliers:** This is especially useful in basket weaving. It is used for giving canes a sharp bend without breaking them. Pliers are also useful when drawing a cane through a restricted passage during weaving.
6. **An awl or bodkin:** This tool is useful in piercing holes through fabric, leather and other soft materials, and in enlarging passages during cane weaving.
7. **Sandpaper, glass paper or sandpaper leaf:** These are useful for sanding canes and other woody materials that need abrasives smoothening.
8. **Broken shell glass:** It helps to scrape the outer surface of canes.

9. **Rubber pad:** A sheet of soft rubber material, such as the kind used for the sole of traditional sandals (ahenemma) or bathroom slippers (Chalie wortey) or rubber tyre, secured to the top of a working table or desk makes it easy to roll grass stalks.

2.9 Elements in Traditional Weaving Designs

2.9.1 Lines

As a structural element, the line exists in nature. It can work independently to suggest forms that can be seen and seen as a transmitter by their character and direction of information through emotion and state of mind (Sackey, 2013). They are used to create fabric design textures and patterns. Each generated model consists of different lines. Asmah (2014) defines the line in its drawing, where the length is longer than the width, as a fundamental mark or brush.

A line can be considered so close together that its individual identity is lost and a new entity is created. Since lines can be straight, curved or shaped irregularly, it is a pathway to a point movement. The horizontal line indicates a feeling of rest, vertical lines communicate feelings of elevation and spirituality, and a sense of movement or direction is indicated through diagonal lines. The curved lines are of particular meaning. Soft, shallow curves offer comfort, safety, familiarity, relaxation and pleasant sensual quality, which recalls the corners of the human body (Sackey, 2013).

Jirousek (2010) describes the line in its direction, weight, and difference in the direction as a mark created by a moving point and having a psychological impact.

It is a very useful and versatile graphic device designed to work both visually and verbally. The quality of lines in "Fugu fabric" and "kente" is a visual essential language that no other element can claim. The soft, irregular lines of the hand-woven fabric in Ghana can be recognized as a symbolic language or emotion that can be expressed in its character and orientation (Asmah, 2009).

Line quality itself refers to the mood of the fabric and the consistency of the line is a fundamental expression of the fabric's fashion for the weaver. The line serves as a boundary between thoughts, principles or development steps, and forms and shape edge (Jirousek, 2010).

2.9.2 Shape, Form, and Space

The formation in, "Fugu fabric "and,, kente," of a series of similar forms, is a good way to bring a sense of cohesion with a process that does not seem to fit correctly. "Kete" is the geometrical, human and natural shape of animals. Forms and forms are regions or masses that describe space objects (Lovett, 2010).

Shapes can be classified in different ways. Two or three-dimensional forms may exist. The two-dimensional form is large and can also create a three-dimensional image illusion. The size, width and height of three-dimensional forms. Shape and shape may also be represented organically or geometrically (Jirousek,1995).

In its contour, and most often asymmetrical and thought to occur naturally, Jirousek (2010) describes organic forms as being irregular and defines geometrical forms as those that correspond to the normal forms, such as squares, rectangles, circles, cubes, spheres, cones, and other regular forms.

Dennis (2014) provides examples of forms used in "kete's" such as seats, tables, pebbles, books, simple words, names, and geometrical types. The "kente" is made up of geometric shapes, such as triangles, columns, kite and the like. These patterns are unique features of the "Kete." The designs of "Fugu" consist of lines decided by warp laying. In Ghana, these distinctive shapes contain certain components such as texture.

2.9.3 Texture

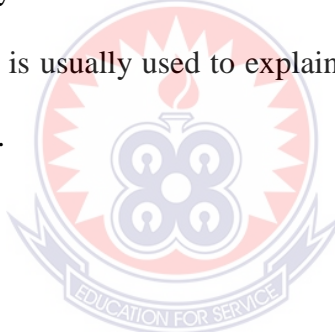
It is a design element. It is the surface of the fibre formed by the tissue and the reflection of light. The surface shape of a woven material affects the appearance of the textile. Gloss is the degree to which the artefacts are rough or smooth. Lovett (2010) describes texture as the quality of a form's surface-raw, smooth, hard, soft, glistened, etc. In addition, it can be both visual so tactile. It shows that it is the surface characteristics of a material that can be experienced by touch or illusion.

The eye enjoys light playing smoothly or roughly, the hand feels the fabric's surface and the ear hears a textured sound, such as taffeta's tail. Okamoto, Nagano and Yamada (2013) have explained that the texture of a fabric, whether soft or smooth, hard or rough, silky and/or leathery with a particular effect, is to be considered in the preparation of the design. Before planning, preparing and designing a fabric a designer should be aware of these factors. To produce the desired and successful outcome, this must be used.

Dillon et al., (2011) describes how dried flowers can be arranged by claiming that, the surface texture of the plant material significantly determines the appearance of the arrangement. This shows the importance and the best integration possible of every design surface, whether from North or Ashante or Volta.

2.9.4 Colour Symbolism

Colour is an important aspect of fabric design as it considerably influences the aesthetic appeal of fabric. Asmah, (2014) explains two theories of colour and these are light and pigment theories. These theories depend on the twin reflection and absorption of colours. In textile dyeing technology, the pigment are usually what is considered (Aspland, 1993). Colours derived from the pigment theory can be divided into primary, secondary colours and intermediate or tertiary colours (Decker, 2017; Fussell, 2019; (McKinley, 1027)). The primary colours are red, blue and yellow while the secondary colours are obtained by combining the primary colours such as Blue and Yellow to get Green, Red and Blue to get Purple or Violet and red and yellow to get orange. The secondary colours are mixed to obtain the tertiary colours. A colour wheel or colour spectrum is usually used to explain the theory (Jirousek, 1995). This is illustrated in Figure 2.3.



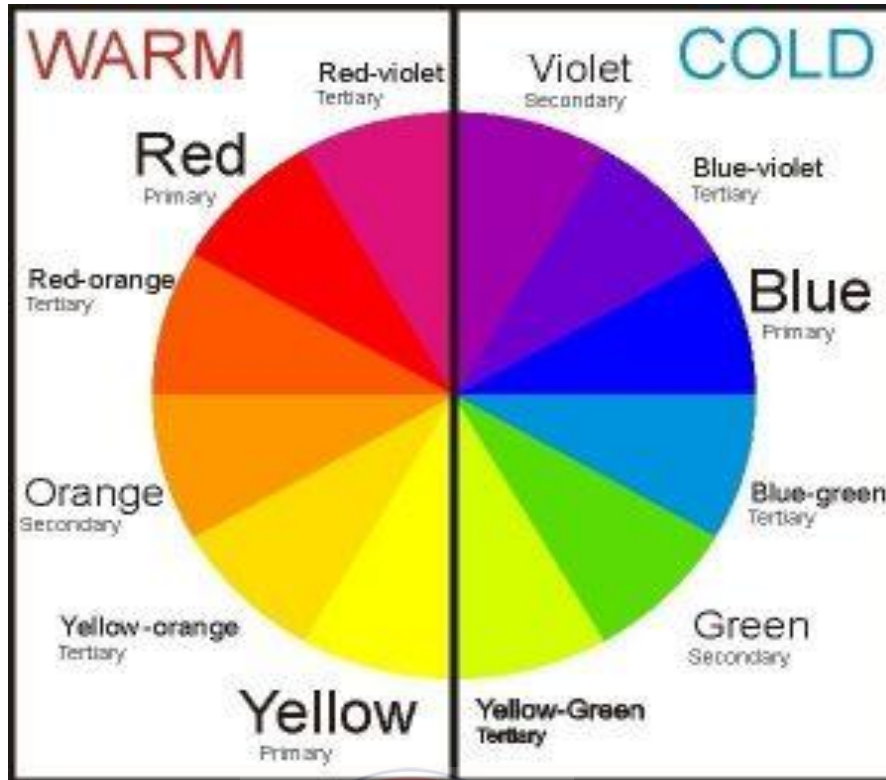


Figure 2.3 Colour Spectrum (Przybyla, 2018)

The pigment theory is based on the Brewster theory (Miller & Pine, 2013). Per his theory, the circle of the pigment colour is divided into eighteen equal parts with the primary colours placed at equal distance from each other with the secondary colours between them. The tertiary colours are between the primary and the secondary colours (Milla, 2014).

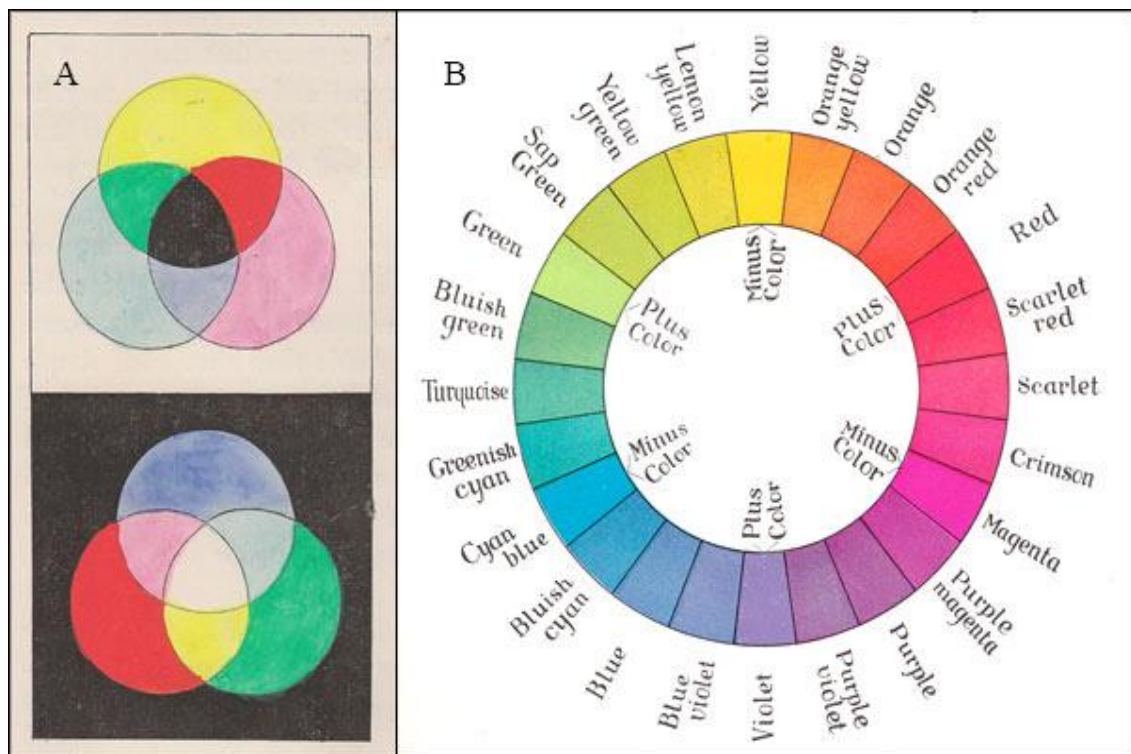


Figure 2.4 Brewster Colour Theory (Briggs, 2007)

“Fugu fabric” and “Kente” have their philosophical meaning of the colours used. On the basis of these, the above theories will assist the researcher to choose colours that harmonize and blend well. The use of colour is one of the main aspects of the research as every fabric has its own colour and a reason for its use (Asmah, 2014). Asmah (2014) again states that indigenous woven cloth represents the history, philosophy, aesthetic principles that weavers use to weave the cloths. This also represents the design and colours found in the cloth.

This explanation shows that colours are used according to underlying socio-cultural perspective of colour meaning within that particular community. The research seeks to integrate two traditional weaves which have their own colour and design symbols to produce a unique fabric. Colours are used in ritual ceremonies in Ghana to show

the culture of different tribes. They are used to distinguish between different categories of ceremony (Asmah, 2014). Colours thus hold significant meaning for people and influence their emotions (Elliot, 2015). Colour conveys meanings in two primary ways: natural associations and psychological symbolism. Colour can also derive its meaning arising from any of the following; Cultural, Political, historical, religious, mythical and Linguistic (Elliot, 2015).

Korankye (2010) explains how the colour of an object is seen by the eye. This means that the eyes play an important role when talking about colour. A colour must be well seen before it can be appreciated.

Korankye (2010), who also stated that the eye reflects and absorbs colours in a tissue, explained the coloured objects reflect and absorb waves of colour. Some people appreciate the beauty of an analogous colour scheme; others prefer complimentary arrangements; some only select the colour scheme for an event. The beauty and style are well arranged in colour and design (Korankye, 2010).

Colour has such a powerful effect on people that it can be used therapeutically (Dillon, 2011). Colour sensation is a characteristic of human experience that is used when designing fabric, clothing, painting at home, colouring food, furnishing, lighting, paper design identification and security (Lartey, 2018).

2.9.4.1 White

The imagery of the white part of an egg, snow, rodent, cotton, porcelain and white clay is derived from this. It is used in spiritual cleansing, healing, holiness and

celebration rituals. It symbolizes contact in certain situations with ancient spirits, gods and other unknown spiritual entities like ghosts (Morton, 2017).

It is assumed that a child is born "pure," without sin and, as he/she grows up and dies, returns to a "pure" condition again, which means "pureness" which means white colour marks the beginning and the end of life. It is therefore surprising that both the infant and his or her family, and in particular moms, adorn white clothes in almost every part of Ghana when a child is born. The ropes are also white, though Muslims also use the ropes or cloth to bury their dead (Akwetey, 2007).

2.9.4.2 Blue

The air, wind, water, and Sapphire are all related. It reflects rest, coolness, quietness, joy, tranquillity, stability, harmony and ideas connected with love. Blue is cold and seems to be fading from the eyes. A blue room is calmer than red, while the sky calms down and the human body is relaxed (Morton, 2017). Morton (2007) indicates that different blue colours used together might look a little cold and unsurpassed. The use of blue hand-woven fabrics in Ghana will, therefore, be brought to light. Most of the fabrics used for this study contain the colour blue, especially so with the Gonja "fugu" from Daboya is outstanding with the use of the natural plant in dyeing their blue yarns.

2.9.4.3 Green

This is associated with vegetation, freshness, jealousy, innocence, harmony, reassurance, peace, planting and harvesting (Asmah, 2014). During purifying rites, tender green leaves are generally used to sprinkle water. It represents expansion,

vigor, fertility, wealth, fruitfulness, good health, and spiritual renewal. (Asmah, 2014). Green is perfect for creating a natural, restful and secure environment. A touch of green in fabric design will have much the same cheering effect as seeing new leaves and shoots after a long rain. It blends and combines successfully with most other colours. Turquoise, emerald, apple green, acid lime, soft olive, sage, pistachio and forest green are all types of greens (Lartey, 2014).

2.9.4.4 Yellow

The rose, sunflower, gold, butter yellow, and egg yolk are all associated with yellow. It has to do with hot climates, and raises spirits. Yellow is a very luminous and vibrant colour conveying the concept of purity and symbolizing holiness, preciousness, royalty, riches, faith, health, sun, joy and fertility. Asantes love yellow as it symbolizes the land's abundance. During trips and festive times, the chiefs are decorated with gold to display the richness of the land (Lartey, 2014).

2.9.4.5 Red

Red symbolises passion, anger, warmth, and energy. Therapeutically, it increases heart rate and circulation. Red looks to be a bright and joyful color that provides the sensation of warmth and moves towards the viewer. (Ajibade & Obongha, 2012).

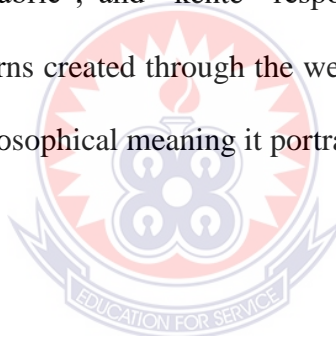
2.9.4.6 Value

The relative brightness or darkness of a region is described by its value. In a way, value ignores hue and simply considers how much tint, or the addition of white, or shade, or the addition of black, a color may have. It doesn't totally ignore color,

though, because all fully saturated colours will fall into a distinct natural value scale (greyscale) level (Jirousek, 1995; Fussell, 2014; Manning, 2012).

Values aid in the creation of shapes and the differentiation of space and length. The illusion of volume and mass is created by gradation of values inside a space or shape, which may be loosely anticipated by looking at the color of the item. Pure yellow will fall near the top of a greyscale, while pure blue-violet will fall near the bottom of the greyscale. All other pure hues fall somewhere in between (Jirousek, 1995; Manning, 2012).

The watcher of “Fugu fabric”, and “kente” responds more directly to the formal constructions of the patterns created through the weaving and the message it portrays as every design has a philosophical meaning it portrays (Lartey, 2014).



2.10 Types of Looms

The loom is the most significant piece of equipment in traditional cloth weaving. Looms come in a variety of sizes and shapes. According to Hatch and Osterwalder (2013), the shuttle-less loom has no shuttle. A discrete length of yarn is removed from an external supply package and passed through the shed at the right point in the weaving cycle to replace it. This indicates that shuttle is not used on every loom. Other looms, such as Rapier looms, employ a rapier, a rod, or a steel tape to move filling yarns through the shed from a fixed yarn bundle at one end of the loom, according to Hatch and Osterwalder (2013). This determines the breadth of the woven cloth. Another is the Air-jet loom, which uses a jet of air to carry the filling through the shed (Ross & Adedze, 2008).

The main nozzle with the electronically controlled relay nozzles providing additional booster jets to carry the yarn farther provides the initial propulsive force. This is followed by a water-jet that uses a higher-pressure jet of water to carry the filling yarns through the shed. The filling yarn is drawn from a stationary package at the side of the loom, enters measuring drums and continues through a guide to a water nozzle, where a jet of water carries it through a shed after the beat-up of the filling. Filling streaks in fabrics are rare due to minimal tension on the filling yarn during intersection. The looms described above are faster than the locally made looms which the researcher encountered.

Asmah (2014) describes a type of table loom which is triangular in nature and placed on the thigh of the weaver during weaving. In his book, *Ashante Traditional "Kente"*, he quoted Adjane, a weaver who indicated that "Ayasedua" was the first loom to have been used among the Ashantes to produce a Kente called "Ayase Ntoma" („Ayase" is the abdomen in Akan). This was followed by "Asasedua". The third loom was „Nsadua" which looks bigger than the "Asasedua".

The loom was named Kofi because it was completed on Friday. Other looms were developed in the Department of Integrated Rural Art and Industry, College of Art at the Kwame Nkrumah University of Science and Technology Kumasi. They were developed with the aim of eliminating problems such as time wasting and the use of adequate space during pre-weaving and weaving (Asmah, Okpattah, & Hateka, 2015)

2.11 Weaving Techniques

Several weaving techniques exist for weavers to choose from. The list includes plain, twill, sateen and satin weaves. Weaving is the systematic interlacing of two or more sets of elements usually, but not necessarily, at right angles, to form a coherent structure. No one knows when or where the weaving process actually began, but as far back as there are relics of civilized life, it is thought that weaving was a part of developing Civilizations (Fiadzo, 2010).

2.11.1 Weaving Operations

Four major operations are involved in weaving: shedding, picking, beating up (battening) and taking up and letting off (Badoe, 2010).

Shedding: Each alternate warp yarn is raised or lowered to create a shed.

Picking: As the warp is raised or lowered to create a shed, the filling yarn is inserted through the shed by a carrier device such as the shuttle or the hand.

Beating up (battening): In this operation, the reed pushes or beats each filling yarn to the fell of the cloth. Reed is a comb-like structure attached to the loom. It gives the fabric a firm, compact construction.

Taking up and letting off: With each shedding, picking and beating up operation, a fabric would be produced. In order to wound the produced fabric on the cloth beam and released a new warp for weaving it is known as take-up. At the same time, releasing a warp yarn into the system from the warp beam for weaving process to be carried out is called letting off.

2.12 Hair Weaving

African weaving methods are particularly popular in American hairstyle fashion, which provides entertaining and diverse appearances. Hair weaving is done with or without understanding of the African American community's hair weaving traditions, As seen in Figure 2.5. Depending on the techniques used, a weaving might span anywhere from one week to three months (BBC News, 2015).

"Basketry materials come exclusively from specific regions, at certain times of the year," Osei (2011) explains of the origin of natural fibre weaving. Such information, as well as harvesting and processing procedures, are as necessary for the art's survival as weaving itself."

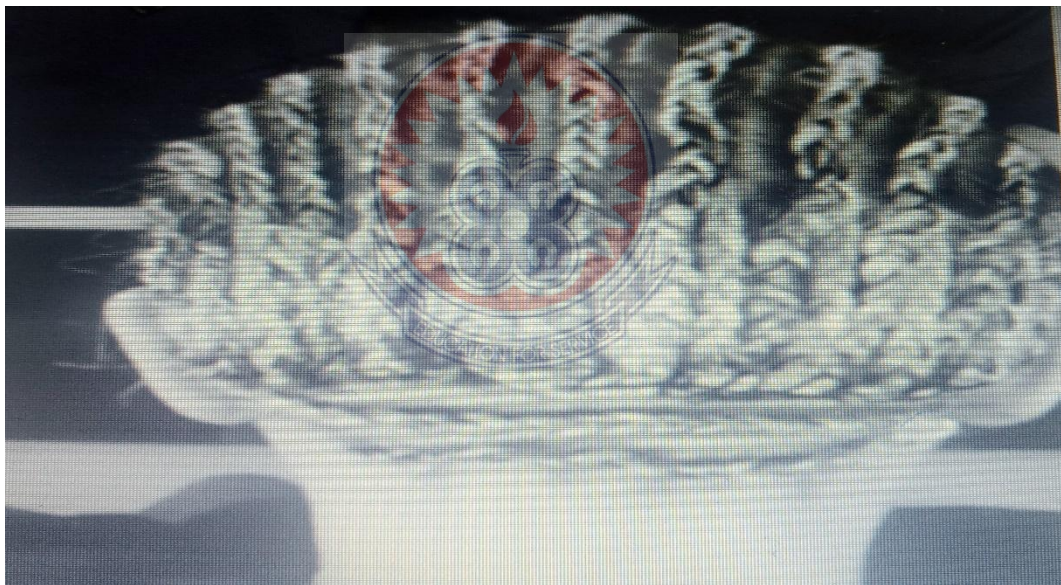


Figure 2.5 Hair weave

Source : <https://w.google.com/search>

2.13 Plain Weaves

Plain weave, as explained by (Mishra, 2012; Badawi, 2007; SWADESH, Handlooms & Beyond, n.d Date), is the simplest and by far the most popular of all woven structures. It allows the maximum amount of interlacing of the warp and weft and so

for the same set of yarns, a fabric produced from plain weave will have greater stability and firmness than fabrics produced from any other weave. Figure 2.6 (a) & (b) shows a plan view of the most popular weave, which is called the plain weave. This method of illustration clearly shows the order of interlacing in simple structures but it can become quite complicated and also require a lot of space and time when large weaves are being designed (Apau, 2013).

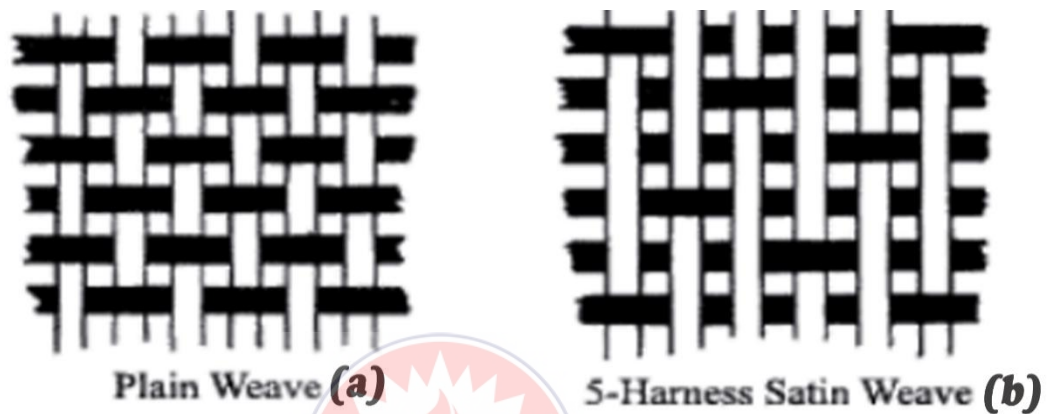


Figure 2.6 Basic plain weaves (a) & (b)

(Source : <https://w.google.com/search>)

The Cross-sectional diagram, as in Figure 2.6, sometimes becomes complex when more than one or two longitudinal threads are illustrated in one diagram. Weaves fall within three main categories, a namely basic weave which is the most popular (Apau, 2013).

Cross Section View of Weaves



Figure 2.7: Cross-section of a Plain Weave (1/1) and a Twill Weave (2/1)

(Source : <https://w.google.com/search>)

2.14 Twill Weaves

Twill weaves are characterized by diagonal lines in the fabric. These may run from bottom left to the top right in which case the twill is said to be Z twill because its line is in the direction of the centre stem of that letter. Likewise, twills that run from the bottom right to top left are known as S twills example in Figure 2.8 (a) and (b) respectively (Haque, 2020).

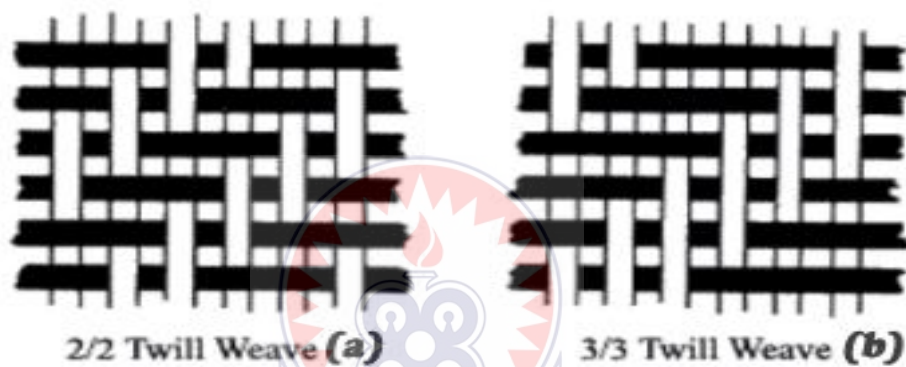


Figure 2.8 Basic Twill Weaves (a) & (b)

(Source : <https://w.google.com/search>)

According to Fiadzo (2010) all of the ends in the twill weave lift alike but each end starts its lift one pick higher or one pick lower than end adjacent to it. This is referred to as a step of one and it is clearly illustrated in the 2/2 twill in Figure 2.8 (a). The 3/3 twill shown in Figure 2.8 (b) is an extension of that weave because each end is given an additional lift to that of the original twill.

Again Haque, (2020) the number of ends and picks in any twill weave is the sum of the numbers in the weave description, hence both the $\frac{1}{2}$ and $\frac{2}{1}$ twills repeat on the three ends and three picks. The former weave may be designated as either $\frac{1}{2}$. The

common twill weave is the 2/2 and 3/3 illustrated in Figure 2.8 (a) and (b) respectively.

Twills in which the numbers of warp and weft lifts are equal are called balanced twills. The 2/2 weave is the most popular and it is used in such ends. The 2/2 twill is popularly known as “Gaberdene” weave (Haque, 2020).

The characteristic features of satin and sateen fabrics are smooth and lustrous surfaces created by the extensive floating of the warp or weft on the attributes this to the fact that satin fabrics generally have many more ends than picks per centimetre, while in a sateen fabric the pick will be higher. In this study, the Plain, Twill and Jiffy weaving techniques were adopted (Onder & Berkalp, ITU, n.d).

2.15 Other Methods of Fabric Constructions

2.15.1 Knitting

After weaving, the most prevalent method of fabric construction is knitting. Its popularity has grown tremendously over the years. Today, knitting is a very big industry that has two main divisions. One division manufactures knitted goods for apparel production, sewing centres, consumers and others. The other division manufactures finished apparel such as hosiery, sweaters and underwear (Bullón Pérez et al., 2017).

2.15.2 Finger weaving

Rug works mat and finger weaving sashes and ganders were woven of commercial yarn in three or more colours. Finger weaving was a popular technique, in which the yarn strands were wound around a short set (Fiadzo, 2010).

2.15.3 Mats weaving techniques

Traditional mat weaving, is practiced in several regions of Southeast Asia, the weave presents some interesting designs that can lead to the creation of plaited forms with interesting mathematical properties. Basic mats are made of long, narrow strips of locally available reed or leaf, the interlacing of which is obliquely oriented (i.e. diagonally or at an angle) to the outer edges of the mat, although the local interlacing of elements is generally perpendicular (to each other) (Knoll, Landry, & Taylor, 2013).

Experts have debated the classifications and terminology of basketry construction for ages. However, basketry is created with elaboration and variation of four basic basket construction techniques, namely coiled, twined, plaited and woven structures (Osei, 2011).

Coiled weaving technique: A bundle of strands or rods is stitched into a spiral oval or round form with a thin, flexible element to create coiled baskets. Basket Makers, (2013). Numerous combinations of stitch styles and ornamentation such as imbrication can afford a wide range of core material possibilities including prime needles, cotton, willow, yucca, palmetto, sweet grass and other grasses. Stitching elements can be things like, raffia, horsehair, ash wood splint, devil's claw, palmetto, skinned willow (Fiadzo, 2010).

Twined weaving techniques: Other foundation components are encircled by two or more flexible elements. Paining is the term for when two weavers utilize these methods together. Waling is when three or more components are twisted together (Fiadzo, 2010).

Twining rows atop rows or leaving an open warp, crossing the warp, wrapping the warp, twining plain or on the diagonal, and other techniques can be used to create variations. Day ladies, cedar bark, elm bark, reed, rabbit bush, and roots are examples of flexible native naturals. You may also use waxed linen, cordage, or different fibers (Basket Makers, 2013). **Woven techniques** - Woven baskets have two sets of elements, rigid stakes or spokes which create a warp and more pliable elements that are woven in and out to form a weft. Materials in woven basketry can be flat or round and can be any of a wide variety of materials such as willow, wood splint, paper and reed, (Basket Makers, 2013).

Plaited techniques: Plaiting is the weaving together of like elements stakes and weavers. The plaiting can be open checker work or closed. Splint materials are flat weavers that have been splint or pounded from a native hardwood such as white oak, maple or ash. (Basket Makers, 2013). In the Visual Art syllabus for Senior High Schools, it is stated clearly that art should be taught in the schools to preserve, transmit, improve and promote indigenous art technologies so that the students will know their cultural heritage (The Ministry of Education, 2010). Acceptable in the community in which they live and the country as a whole and be in particular, the school system should, in a country like Ghana, aims at instilling in the individual, an appreciation of the need for change directions towards the development of the human and material resources of the country (The Ministry of Education, 2010).

2.16 Weaving in Ghana

In Ghana, indigenous weaving of cloth is mainly done in the Asante, Northern, and Volta Regions. Traditional Asante's woven cloth is known as Kente while that of north is called Fugu fabric or Fugu.

The Fugu is completely different from kente in that the cloth is basically woven in plain-weave structure. The common colours are black and white even though some are woven with other colours. Fugu is well known with its coloured pattern warp. Kente on the other hand, are somehow similar in structure in the sense that both fabrics are handwoven, shapes and images are introduced in weave structure. Kente weave is similar with Fugu but it is characterized with its geometrical shapes being woven to create meaningful designs and to tell a story.

Hessie, (2010) states that weaving is the oldest craft known in Ghana. Before weaving was introduced to the Gold Coast, the material used for clothing was obtained from the bark of kyenkyen tree. According to him, the Asantes stripped off the bark in long, narrow pieces which were then softened in water, laid over the trunk of a fallen tree and then beaten out with wooden mallets with round corrugated heads into a somehow flexible material that was used as a covering (Badoe and Opoku-Asare, 2014).

Similarly, Herman, (2010) explains that before woven cloth and cotton materials were introduced to the people of Gold Coast, the Ewes made cloth from the bark of trees which they called Logo. Herman indicates that as time went by, people learned to twist fibres and hair of animals together with their fingers, and then rolled them

against the thigh, as is still practiced by some traditional weavers. People found out that the fibres of plants and the hair of animals could be spun into yarns for weaving clothing. (Badoe and Opoku-Asare, 2014).

According to Baah (2010), Asante's cloths of extravagant woven pieces were being made from costly foreign silks that had been unravelled and woven with all the varieties of colour and pattern. These clothes were worn thrown over the shoulder like the Roman toga.

Kente weaving is a textile production technique whereby very small looms are used to produce long and narrow lengths of cloth, which may then be joined edge to edge to create a square or rectangular cover. The technique offers endless possibilities for variations of scale and composition (Badoe and Opoku-Asare, 2014).

"Fugu fabric" and "Kente" are not simply patronized for their beauty but also for their symbolic meaning. Every cloth has one name and one meaning. The patterns and motifs have names and meanings derived from historical events, individual accomplishments, proverbs, philosophical ideas, oral literature, moral principles, social code of conduct, human actions and some characteristics of plant and animal living. Geometric abstractions of objects identified with the intended purpose make patterns and motifs (Asmah, 2009; Lartey, 2014). These are generally created by weavers who also assign names and meanings to these patterns. Sometimes, kings and elders may ascribe names to cloths that they specially commission to be made for them. There are over 300 different types of cloths and/or designs, each with its own name (Tettehfiio, 2009).

2.17 Traditional weaving processes

Pre-weaving processes involve ginning, balling, bale breaking and mixing, carding, spinning, sizing and dyeing. Ginning is mainly done by women and children. The cotton is then packed into sacks or specially woven baskets with covers and stored until it is required for use. The next stage is bale-breaking and mixing which involves the removal of fibres from different sacks or baskets and mixing them thoroughly in order to achieve a uniform yarn when these are spun into yarns. This is followed by carding, the process of refining the mixed cotton by removing very short fibres, twigs and other unnecessary elements from them (Fiadzo, 2010).

Carding is the first stage of converting fibres into yarns and is done by subjecting a mass of fibres to vigorous combing to eliminate irregular ones from the strands. Carding is done by collecting a quantity of cotton at a time, placing them on a carved wooden bowl with strings attached to it and using another bowl to run through the fibres so that the needed cotton is collected onto string on the bowl. This is repeated until the cotton becomes fluffy and well opened up with the fibres partially straightened out. When the 'carder' is satisfied with the condition of the fibre, the wet cotton is removed from the bowl and put carefully into a big calabash ready for use (TRC Leiden, 2017).

Spinning is the process where cotton fibres in a lap form are made into silver, roving and finally into yarn. The spinner draws a number of fibres from that which is wound on the distaff. Sizing is an addition of weight to the yarn. This is done by steeping the yarn in cassava starch and it is then allowed to cool. The whirled spindle is allowed to descend slowly (Badoe, 2007).

2.18 Contemporary Weaving

In Africa, the West African sub-region has been recognized as a procession developed culture of weaving. The fabrics are designed for body clothing and prayer mats (Fiadzo, 2010).

Ghana has an old tradition of narrow strip weaving especially among the Gonjas, Mamprusis, Dagombas, Gurunes and Dagaares. In the Northern sector, the weaving centres include towns like Daboya, Lawra, Bole, Wa, Kunbungu and Tamale. (Dokosi, 2016; Awedoba, 2006).

The conventional method of Ghanaian weaving is characterized by horizontal looms. These produce narrow fabrics that must be joined together to obtain the required size of the cloth (Lartey, 2014; Fiadzo, 2010). The Ashante Nsadia Kofi and the Ewe Agbati are the two most popular indigenous looms in Ghana. The foot-power looms are larger types of horizontal handlooms which had been the traditional weaver's looms in Europe (Micots, Kente Cloth (Asante and Ewe peoples), 2017).

After studying a few indigenous weaves in Ghana, the researcher realized the need to modernize the equipment and techniques of weaving our rich kente and fugu. He finally designed a new loom, which although similar was of remarkable improvement to all existing indigenous looms in Ghana (Lartey, 2018)

2.19 Weave Integrations

The interlacing of warp (end) and weft (picks or fills) threads at right angles, depending on the kind of weave required, is necessary for the integration of "Fugu

fabric" and "Kente" weaves. All woven textiles are constructed in right angles with two or more sets of threads interwoven, Korankye, (2010). The author also mentions the widespread usage of woven materials. Weaving is one of the oldest and most widely used methods of fabric production.

Weaving is defined by Korankye (2010: 302) as "two sets of strands interlacing to make a cloth." The author has depicted the loom's broadloom marked pieces and attachments. He described the "Kente" loom and demonstrated its components as well as the weaving procedure.

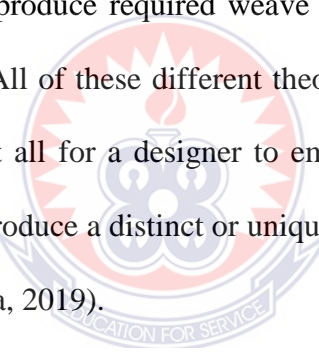
2.20 The Design of weave structures of Northern and Ashante Weaves

According to Fiadzo (2010), "Fugu", and "Kente", are ceremonial hand-woven cloths, woven on a horizontal treadle loom. These strips measuring about eight to ten centimetres wide (8cm-10cm) are sewn together into larger pieces of cloths, which come in a variety of colours, sizes and designs and are worn during special, social, and religious occasions. Numbers of design elements are combined to make the design of "Fugu fabric", and "kente". The most important part of the fabric is the creative part of it. People have their own preferences concerning shape, colour, texture and pattern. The elements of design used in "Fugu fabric" and "Kente" are lines, shape, form and space, texture, colour, and value (Dennis, 2014).

2.21 Theories of Integration

There is enough research on the weave structure of the integrated woven fabric. Griswold (2011) proposed algorithms on using Boolean operations in integration pattern design. Rasmussen (2008) discusses the theory of binary representation of

fabric structures and the possibilities of weave category in order to integrate families of weave patterns. Rao et al., (2009) developed 3-D geometric models for the morphological integration of fabrics with the unit-cells of four harnesses, five harnesses, and eight harnesses. Shinohara et al., (2008) on the other hand proposed a novel automatic integration of weave diagram construction method from yarn positional data of woven fabric. Inui (2011) developed a method to obtain computer simulations of integrated woven fabric structures based on photographs taken from actual yarns along their lengths. Similarly, Ma, et al (2011) proposed an encoding algorithm to reveal the hidden information in the binary matrix of an integrated weave pattern so as to obtain a solution to determine features of the weave pattern. It enables the possibility to quickly produce required weave geometries and weave textures at different levels of detail. All of these different theories of integration are indications that it is not a bad idea at all for a designer to embrace the integration of different fabrics and/or weaves to produce a distinct or unique fabric and that is what this study sets out to achieve (Sharma, 2019).



Generally, fashion involves change, novelty, in the context of time, place, and wearer. Blumer (2009) describes fashion influence as a process of “collective selection” whereby the formation of taste derives from a group of people responding collectively to the “spirit of the times.” The simultaneous introduction and display of many new styles, the selections made by the innovative consumer, and the notion of the expression of the spirit of the times provide the impetus for fashion. It is worthy of note that the study of fashion in the twentieth century has been framed in terms of a fashion systems model with a distinct centre from which innovations, integrations and modifications radiate outward (Davis, 2012).

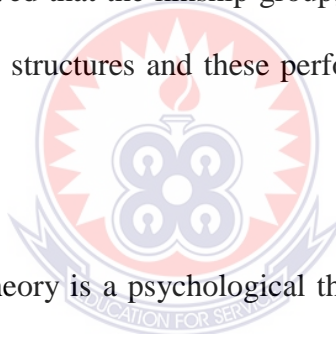
A piece of fabric may appeal to a consumer by its appearance, which is related to the weave structure and the colours of the warp and weft yarns. The characteristics, for example, the permeability, the thickness, the tenacity, the elongation, among others, of the fabric is required. Finally, the price is used as an evaluation basis, by comparing, based on the above-mentioned items (Lartey, 2014).

Recently, some sociologists have been taking a different approach to sociological theory by employing an integrationist approach - combining micro- and macro-level theories to provide a comprehensive understanding of human social behaviour in the fashion and/or fabric industry. Numerous models could be presented in this vein. The Integration Model is a good example (Halle, 2016). Halle proposes four highly interdependent elements in his sociological model: a macro-objective component (e.g., society, law, bureaucracy), a micro-objective component (e.g., patterns of behaviour and human interaction), a macro-subjective component (e.g., culture, norms, and values), and a micro-subjective component (e.g., perceptions, beliefs).

This model is of particular use in understanding society because it uses two axes: one ranging from the objective (society) to subjective (culture and cultural interpretation); the other ranging from the macro-level (norms) to the micro-level (individual-level beliefs) and all of these influence integrations in the weaving industry (Doda., 2005). Halle's (2016) integration approach is particularly useful for explaining the social phenomenon because it shows how the different components of social life work together to influence society and behaviour. For instance, the model depicts that

cultural norm can influence individual behaviour. The model also shows that individual-level values, beliefs, and behaviours influence macro-level culture.

In general terms then, integration is defined as a process of developing a society in which all the social groups share a common socio-economic and cultural life (Davis 2012). The integration of communities is facilitated by the factors that help assimilation. Blumer (2009) on the other hand, defined integration as a model of the relation of the units of a system by virtue of which on the one hand they act collectively to avoid disrupting the system and making it impossible to maintain stability and on the other hand to cooperate to promote its functioning as a unity. Blumer (2009) also believed that the kinship group, family, profession, the state, and religion are visible social structures and these perform the function of integration in various forms.



The feature integration theory is a psychological theory that describes how a person pieces together separate features of an object. This theory focuses on the sense of sight and how the eyes absorb information (Davis, 2012). Aside from perception, the feature integration theory also discusses the importance of attention in making a correct view of the observed object (Kristjánsson and Egeth, 2019).

The development of the feature integration theory is largely credited to (Treisman and Gelade, 2010), who co-wrote an academic paper, entitled “A Feature-Integration Theory of Attention” in the 1980s. In the paper, they cited several past experiments that revolve around “visual search,” or the process in which the individual, for example, distinguishes the object’s colour and shape apart from other objects. Theory

of feature integration suggests that attributes of a certain object are processed in sequence. For example, if a person is looking at a crowd for a male friend who has shoulder-length hair, the first step is to look for people who have shoulder-length hair (Treisman and Gelade, 2010).

The feature integration theory describes two primary stages of attention: the pre-attentive and focused attention stages. In the first stage, a person focuses on one distinguishing feature of an object. The person does not really need to make a conscious effort to think at this stage. In stage two, the person takes all the features of the object and combines all of them to give a correct perception (Treisman and Gelade, 2010).

Treisman and Gelade (2010) feature integration theory greatly influenced the focus of this study on the integration of the various weaves from the two geographical regions that formed the focus of this study. The decision to focus on feature integration is due to the fact that training and practices that apply feature integration theory can help a person improve his/her skills in abstract reasoning and attention. They can also help him/her to be more aware and careful of his/her surroundings and the innovations that arise from applying feature integration (Treisman & Gelade, 2010). An integrated cloth is more than simply combining different designs and weaving with different methods: it is the creation of a new cloth with different techniques of weaving that is more than the sum of the separate designs. Once weavers recognise the critical factor in the process of weaving, integration becomes an inclusive process with an increased chance for success, which requires planning, execution and monitoring.

2.22 Possibility of fabric integration

In general, the local weaves are based on the interchange of warp and weft yarn. The difference however lies with the weave design which account for the visual appearance of the fabrics. Contemporary yarns are mostly imported from China, India, Dubai, etc. these are used for both Ashante and the Northern fabrics (Frimpong & Asinyo, 2013; Lartey, 2014; Kovačević & Schwarz, 2015).

In this chapter, the conceptual elements discussed draws on the understanding of the weaving industry in Ghana. This chapter highlighted theories associated with plant dyes, the cultural similarities and differences in the study areas, theories of colour symbolism and characteristics of cotton yarns that have equally been discussed.

It is therefore in the right direction for this research to seek to identify problems with the indigenous weaving industry and institution offering textiles as a course of study in order to find solutions to some of them with the hope of making weaving a viable academic subject. This is necessary as a means to improve upon the technical qualities, design, and aesthetics of indigenous woven artefacts and the use of indigenous weaving materials in the educational institutions.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Overview

This section presents the research methods used to achieve the research objectives of the study. The chapter focuses on the following points: research design, population and sampling, data collection instruments, data collection procedures, data analysis plan and the processes involved in executing the project work.

3.2 Research Design

To be able to answer the research questions within this study, qualitative research method that is used within a wide range of fields was utilized. Mohajan, (2018) explains that the qualitative research method is a systematic collection, organization, and interpretation of textual material derived from a talk, interview or observation.

Qualitative research is a form of social action that stresses on the way people interpret, and make sense of their experiences to understand the social reality of individuals. It makes the use of interviews, diaries, journals, classroom observations and immersions (Mohajan, 2018).

Qualitative research emphasizes the holistic description of whatever is being observed rather than comparing the effects of a particular treatment. The researcher studied how the different weaving techniques from the two study sites were portrayed. The project detailed the weaving techniques, such as "fugu fabric" and "kente," and concluded in the weaving of the integrated cloth.) Therefore, this study employed the qualitative paradigm because the approach allows for a more subjective description of the processes while still maintaining a sense of reliability and credibility. Adopting qualitative research will be an appropriate method to use to gather in-depth

information for the study and using the descriptive approach to analyse the data on the research. The qualitative research approach also allows the researcher to take on a more socially engaging role, since observations and interactions with weavers (interviews) (Mohajan, 2018) produce the data that were utilized to develop the results (Williams, 2007; Zubin & Sutton, 2015; Al-Busaidi, 2008). Even though the qualitative method of research may have various weaknesses as outlined by (Mohajan, 2018), nonetheless, it is accepted as a process for conducting investigation into cultural practices of any community of people.

3.3 Practical Based Research Design

A practice-based research strategy was used in this study. Practice-based research, according to Skains (2018), is original research conducted in order to obtain new information in part through activity and the outcomes of that practice. Claims of originality and addition to knowledge can be proved by creative products such as photos, music, designs, models, digital media, and other performances and displays. While the claims' meaning and context are explained in words, a complete comprehension can only be gained by referring to the outcomes directly (Candy, 2006). The Arts and Humanities Research Board (now Council) evaluates research based on research procedures rather than results (Arts and Humanities Research Board, 2000). However, the majority of practice-based research necessitates that the output be accompanied by an artefact (Candy, 2006).

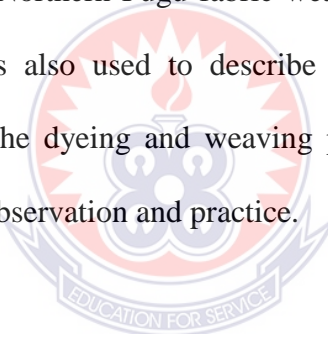
The practice-based studio work will make use of the tools, materials and the techniques of weaving to produce the innovative weave structure from the blend of Northern fugu fabric making techniques and the Asante kente weaving techniques.

Observation and interactions with weavers will help triangulate the data, which will eventually produce the artefact.

3.4 Descriptive Research Design

Lartey (2006) believes that descriptive research involves either identifying the characteristics of an observed event or exploring possible correlations between two or more phenomena. Descriptive research examines the state of a phenomenon and expresses the situation as it is and does not change or modify anything about the condition under study.

The descriptive of the research was adopted to describe the systematic process of production techniques of Northern Fugu fabric weaves and Ashante Kente weaving. This research design was also used to describe the various tools, materials and systematic procedure of the dyeing and weaving processes to resolve the research questions after thorough observation and practice.



3.5 Population and Sampling

The research population is defined as the aggregate or all of the objects or individuals for which inferences are to be made in a study (Krieger, 2012). The research population includes all members of the group (as in a census) who may be reflective of the entire group (Krieger, 2012; Mohajan, 2018). The accessible population was selected from the weaving centres in the following towns namely; Adanwomase, Bonwire, Bepoase, Ntonso, Wonoo, and Tewobabi all in the Ashante region of Ghana.; and Bolgatanga craft village, Namoo and Yeliwungo in the Upper East Region of Ghana.

3.6 Sampling

Sampling refers to selecting a representative unit from a population. Similarly, Cohen, Manion and Morrison, (2013) also explained that in sampling, the researcher endeavours to collect information from a smaller group or a subset of the population in such a way that the knowledge gained is representative of the total population under study. Purposive sampling is described as a strategy in which particular situations, persons or events are nominated deliberately in order to provide information that cannot be obtained from other choices (Maxwell, 1996). In this study, the researcher included cases or members in the sample because they felt they justified their inclusion (Taherdoost, 2016). To assist in the development of the new weaving structure, the purposive sampling technique was used. The purposive sampling technique was used to select a sample from the accessibility population, which is made up of Kente and fugu fabric weaves in the various weaving centres located in these areas, Bolgatanga craft village, Namoo and Yeliwungo in the Upper East Region and Adanwomase, Bonwire, Bepoase, Ntonso, Wonoo and Tewobabi in the Ashante Region were taken when weaving was observed in both populations as shown in TableS 3.1 and 3.2. The researcher focused on specific specimens typical of the respective weaving areas.

Table 3.1 Showing towns, sampling methods, targeted and accessible population

Towns	Sample Methods	Sample	
		Targeted	Accessible
Bolgatanga craft village	Purposive Sampling	31 People	21 People
Namoo	Purposive Sampling	34 People	16 People
Yeliwungo	Purposive Sampling	35 People	13 People
Totals		100	50 People
		People	

Table 3.2 Showing towns, sampling methods, targeted and accessible population

Towns	Sample Methods	Sample	
		Targeted	Accessible
Adanwomase	Purposive Sampling	25 People	12 People
Bonwire	Purposive Sampling	30 People	17 People
Bepoase	Purposive Sampling	9 People	4 People
Ntonso	Purposive Sampling	12 People	6 People
Wonoo	Purposive Sampling	10 People	7 People
Tewobabi	Purposive Sampling	14 People	4 People
Totals		100 People	50 People

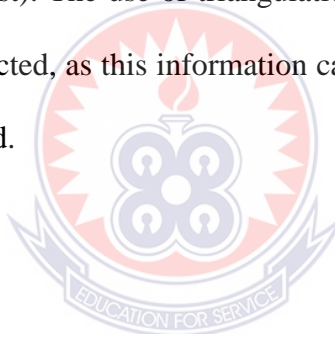
3.7 Sources of Data

In order to make this proven scientific research a reality, many secondary data were gathered from various publications and journals obtained from Akenten Appirih Menkah university. KNUST libraries Kumasi, Ashante Library, Kumasi and the internet. Weaving experts for Kente and Fugu fabrics were contacted at various weaving centres in the Ashane and Northern Regions.

3.8 Data Collection Instruments

Ary, et al., (2013) not in references list) refers to instrumentation as a process used to solicit information in research. To make data collection effective to address the research questions and the demands of the set objectives of the study and also draw shrewd conclusions upon which an insightful proposed alternate strategy could be based on to bridge two techniques of weaving in Ghana as an innovation and to bring some dynamism in the Fugu weaving in Ghana; observation and interview were employed.

The multiple methods of collecting data is referred to as triangulation (Cohen et al., 2000) not in references list). The use of triangulation ensures the validity, credibility and richness of data collected, as this information can be cross-checked or verified by the different methods used.



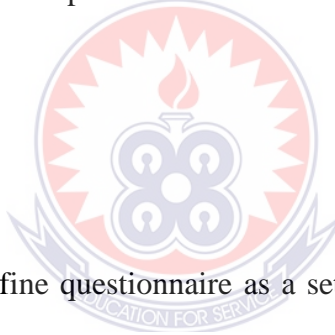
3.8.1 Observation

This process involves information gathering via the investigator's own observation, without interviewing anyone. The participant form of observation was used, where the researcher takes part in the activities of the subjects under investigation, and thus becomes a member of the group, giving the researcher a high level of understanding of the activity under study.

Under the participant observation the researcher used all the senses such as listening, touching, smelling and seeing to observe the various weaving techniques, Kente and Fugu weaving techniques, the tools, equipment and materials used.

3.8.2 Interviews

McMillan and Schumacher, (1993), describe an interview as a direct verbal interaction between the interviewer and the interviewee. In order to obtain accurate data and transcribe them, semi structure form of interview was used for this study. The interview conducted was on one-on-one basis and carried out while observing the participants. The data were recorded empirically and supported by field photography. The researcher interacts with weavers in their local languages which they knew and can express themselves easily, which was later transcribed into English. The flexibility in qualitative interviews allowed respondents to converse with the researcher rather than to enter into the manner in which the questions were answered (Mason, 2010). Respondents were weavers, including trainees and chief weavers.



3.8.3 Questionnaire

Best and Kahn (2017) define questionnaire as a set of written questions designed to elicit information. This means that a questionnaire must contain a planned and organised series of questions that are sent to the population samples. The advantage of using the questionnaire, among others, is that it enables the researcher to source relevant information that cannot be obtained through direct personal conversation with the subjects. The researcher found it appropriate to use the questionnaire to solicit information from respondents to enable him evaluate the finished innovative woven traditional fabric for acceptance. The disadvantageous aspect of the questionnaire is that it can be abused in the sense that it can be poorly administered. To avoid this, however, the researcher administered the questionnaire personally with series of follow-up to collect the answered questionnaire for analysis. The researcher

used a questionnaire in form of a Likert-scale. Also, closed ended questions will be constructed.

3.9 Data Collection Procedure

The interviews were carried out on an individual basis. The researcher asked questions and the interviewees gave answers. The interviews were audiotape and transcribed afterwards. Copies of the English transcript were subsequently sent to the interviewees to verify that the information collected was exactly what they had shared.

3.10 Data Analysis Plan

Field notes were transcribed and data and photographs that described the many procedures that culminated in the final woven product in the research setting were studied in narrative style. These were evaluated and interpreted to create a picture of the current condition in the field of study. The project was designed to gather mainly qualitative data; the data analysis followed a similar pattern with qualitative techniques used on qualitative data. With this in mind, some categorization of data was made and this categorization was types of yarns, techniques of weaving, denting, how yarns are plied in heddles and the outcome of the woven products in the field of study. Information received from individuals on different weaving techniques was also compared. These comparisons helped to appreciate the differences and similarities in the fabrics produced in the study area. Details of these have been provided in chapter four.

3.11 Identification of Kente Weave

The researcher chose to investigate more about Kente weaving to enable him to know more about the uniqueness of Kente cloth, the techniques used to produce it and looked at how good he can incorporate that skill into fugu weaving as decoration process. This was done by reviewing Kente theories, observing from picture studio practices and videos about tutorials of how Kente weaving is achieved and more about its characteristics.

3.11.1 Type of yarns.

Many kinds of yarns are available for weaving. The beauty, texture shine and thickness of each cloth depends on the type of yarns used. The number of yarns put into a dent and the number of yarns formed and used as weft. Kente weaving is done with both the plain weaving and the design weaving and fugu weaving is known solely for plain weaving. Locally spun cotton is usually used which allows the fabric to be heavy and fluffy because the yarns are thick in diameter. In addition, the number of yarns inserted into the dent also contributes to the heaviness or fluffiness of the fabric. Plain weave of Ashante Kente is not very fluffy even if cotton yarn is used because of the yarn used and how it is arranged in the dent of the reed. See Plate 3.1 showing the type of yarns, Plate 3.2 is where the warp yarns are spread on the table and colours applied. Plate 3.3 shows how warps are arranged in the dent of the reed.



Plate 3.1: Machine Spun yarns

Source: Researcher's Fieldwork, 2022



Plate 3.2: Warp yarn spread on table and colours applied

Source: Researcher's Fieldwork, 2022



Plate 3.3: Denting of the Warp for Fugu weaving

Source: Researcher's Fieldwork, 2022

3.12 Production Procedures used for the Fugu Kente weaving Cloth

Materials, Tools and Equipment Employed in the Experiments

The following are the tools, materials and equipment used to perform the experiment for objective two of the study.

3.12.1 Yarns

Rayon and cotton yarns were used to carry out this experiment. The researcher deems it necessary to use these yarns because in the course of his search he found out that Kente weavers use rayon yarns the most in their field of work nowadays. Because of its fine quality in texture and its sheen outlook. Whilst Fugu weavers use cotton yarns the most because that enables them to achieve the qualities of fugu and the fibres too are locally produce given the weaver the easy access of material.

The research used cotton yarns warp and weft especially for simple weaves and a blend of cotton and rayon where designs and patterns were incorporated.

For the production of both cloths, the same procedure and equipment were used. When it comes to the weaving process, the following equipment were used. Loom, Bobbin winders, Bobbins, Skiener, Spool rack, Warping mill, Shuttles.

3.12.2 Loom

The loom is a machine used for weaving. Two kinds of looms were used to weave in this research, namely the Nsadia Kofi of the Ashante traditional loom and the Northern loom known as Motanwureka in the Gurune language of the Frafra tribe. These looms were used because these looms are available and are mainly found in the research areas. Nsadia Kofi is the traditional loom commonly found in the Ghanaian cottage weaving industries. The Northern Loom performs the same function like that of the Kofi Nsadia but slightly different in its structure. See examples of looms shown in plate 3.4 and 3.5.



Plate 3.4: Fugu weaving loom



Plate 3.5: Kofi Nsadia kente loom

Source: Researcher's Fieldwork, 2022.

3.12.3 Bobbin winder

The bobbin winder was used to wind yarn onto bobbins to be used as weft when weaving.



3.12.4 Bobbins

These are made of bamboo or empty pen cups on which yarns are wind and used as weft. They are also used as a spool rack for warping.

3.12.5 Skein winder

This is an apparatus used to unwind hank yarns. It is also used to wind yarn into hank when needed. It was used for unwinding yarns on cones to hanks in order to tie-dye for the picking weft needed for this study.

3.12.6 Spool Rack

This was used to hold the yarns preserved in cones or wound on spools when releasing the yarns from the spools.

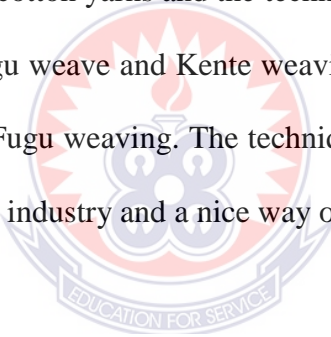
3.12.7 Warping Mill

It is used for warping. That is aligning the yarns that run lengthwise of a cloth.

3.12.8 Shuttle

This was used to carry the weft through the shed for interlacing of weft in the warp during weaving.

The mixture of rayon and cotton yarns and the techniques of both the Fugu weave and Kente weaving, in the Fugu weave and Kente weaving was the main objective of this study to bring novelty in Fugu weaving. The technique of incorporating Kente design motif in the Fugu weaving industry and a nice way of mixing or blending of the yarns.

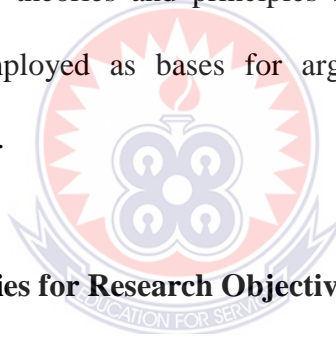


CHAPTER FOUR

PRESENTATION AND DISCUSSION OF RESULTS

4.1 Overview

This chapter aims at explaining the insightful gains and exploration of weaving structures of Kente and the Fugu weave; the pattern of the northern weaves chosen, the kente design chosen, how it was combined to a common weave, its outcome and its introduction into Kente weaving and the Fugu weave production in Ghana. The data congregated from the field have been assembled and presented in this chapter for deliberations. The findings have been discussed in a bid to simplify the analysis, and establish larger implications of the data in relation to the research problem and set objectives. References to theories and principles sieved from the related literature reviewed have been employed as bases for argument, observation, and claims throughout the discussion.



4.2 Discussion of Activities for Research Objective One

To identify the weave structures of the Northern fugu weave and Ashante Kente. The identification of the weaving structures of the Northern Regions of Ghana fugu and Ashante Kente cloth and how to integrate structures of both cloths to produce a common cloth has an alternate yet innovative, Kente or Fugu to be produced in Ghana.

In literature, less is known about kente designs being introduced in Fugu weaving though some kente weaves has some patterns that look similar of that of the Fugu but not the same. The set objective of research question one was to probe into how the weaving structures of both Kente cloth and Fugu weave is, experimenting it by

integrating such weaves in the form of warp patterns and weaving of designs to introduce a more meaningful cloth. The research exhibited numerous warp patterns in the Northern Region fugu weaves and weaving designs of the Ashante kente. Though the weaves of the Northern fugu are simple plain weaves they are thick or fluffy like that of the design weaves of the Ashante kente due to the type of yarns used and how they are plied in both weft and warp. Cotton yarns are normally used in the production of fugu weaves whilst both cotton, rayon and silk yarns are used in the production of kente. Kente weaving, weft and warp are plied at most 2 single yarns together making the cloth lighter in weight at where plain weave is produced whilst that of the Northern fugu weave more than 2 single yarns together at least in both weft and warp and at most 4 more yarns together. Patterns of warp help with the naming of kente cloth and the meaning of it. The same implies to that of the fugu weaves. Particularly with the fugu weaves the cloths are named after the pattern created with collaboration of the colours in the weaving.

Patterns of Northern Fugu fabric designs displayed in Plate 4.1 to Plate 4.6.



Plate 4.1: A fugu weave (Sagkobeco) weave with pattern warp

Source: Researcher's Fieldwork, 2022.



Plate 4.2: A fugu weave s (Boreziya) weave with pattern warp

Source: Researcher's Fieldwork, 2022.



Plate 4.3: A fugu fabric (Saanabodiun) weave with pattern warp

Source: Researcher's Fieldwork, 2022.



Plate 4.4: A fugu fabric (Ganka) weave with pattern warp

Source: Researcher's Fieldwork, 2022.



Plate 4.5: A fugu fabric (Ayonaba)

Weave with pattern warp

Source: Researcher's Fieldwork, 2022.



Plate 4.6: A fugu fabric (Daleya)

weave with pattern warp

Source: Researcher's Fieldwork, 2022.

Kente weaving are also with almost the same warp patterns woven in plain weaves that display the pattern throughout, in design weaves motifs are woven within some warp patterns. Some are displayed with 11 or 15 inches at the border ends of the strip with different design known as border design followed by plain and design that runs alternatively within the middle portion of the design of the cloth. See plate 4.7 to 4.14 respectively.



Plate 4.7: A kente cloth Showing both design and Plain weave with pattern warp

Source: Researcher's Fieldwork, 2022.
Fieldwork, 2022.

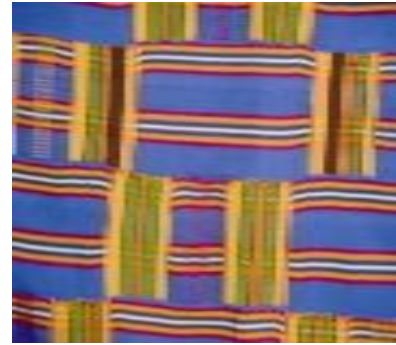


Plate 4.8: A kente cloth Showing both design and Plain weave with pattern warp

Source: Researcher's



Plate 4.9: A kente cloth Showing both design and Plain weave with pattern warp

Source: Researcher's Fieldwork, 2022.
Fieldwork, 2022.



Plate 4.10: A kente cloth Showing both design and Plain weave with pattern warp

Source: Researcher's



Plate 4.11: Kente cloth showing both design and plain weave with pattern warp

Source: Researcher's Fieldwork, 2022.



Plate 4.12: Kente cloth showing both design and plain weave with pattern warp

Source: Researcher's Fieldwork,



Plate 4.13: Kente cloth showing both design on a pattern warp

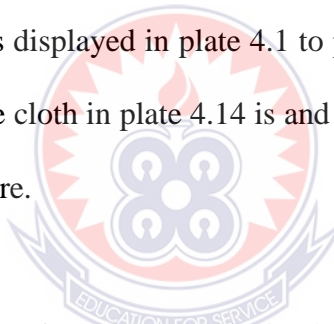
Source: Researcher's Fieldwork, 2022.



Plate 4.14: Kente cloth showing both design on a pattern warp

Source: Researcher's Fieldwork, 2022.

With the fourteen pictures displayed in plate 4.1 to plate 4.14, one could observe how smooth and fine the Kente cloth in plate 4.14 is and how coarse the cloths in plate 4.1, 4.2, 4.3, 4.4, 4.5 and 4.6 are.



4.2 Discussion of Activities for Research Objective Two

Integration of the weave structures of Northern fugu fabric and Ashante kente into a common weave structure.

4.2.1 Yarn Preparation Process for Weaving

Doubling and Twisting

Doubling of the yarns to produce warp for weaving as it removes variations in thickness. Twisting in textile weaving is a process that binds fibres together in a constant strand. The direction of the twist may be to the right as Z twist or to the left as S twist and they are latter wound unto cones as shown in plate 4.15.



Plate 4.15: Doubling and twisting of yarns
Source: Researcher's Fieldwork, 2022.

Warp Calculation

The number of warp ends was calculated as to how one can achieve the fluffy nature of fugu fabric. Therefore, a less dense reed was used. Reed with size eighteen (18) was used and four (4) yarns was drawn in each dent of the reed. Eight yarns were placed in the eye of the fourth heddle on the loom and four single threads (yarns) in an eyelet of the first heddle. To achieve the above procedures, yarns from four cones were used to create crosses as shown Plate 4.16.



Plate 4.16: Showing how crosses were created on warping mill
Source: Researcher's Fieldwork, 2022.

After warping, the formation created by the two pegs as in Plate 4.16 is preserved by putting a cord or yarn through such openings and fasten at the ends. The crosses keep the yarns in the right parallel formation and preserve the yarns from any

entanglements. From here, the yarn is ready to be removed from the warping mill for the next procedures.

In order to preserve the warp, and contain it for the next procedures, it is either chained or wind.

Beaming

Is the process of aligning the warp, freeing it from entanglements putting it in the right parallel formation and winding it unto the cloth roller. This helps the weaver preserve the warp for weaving. This practice is done when one is using the broadloom or the imported looms but with the local looms in Ghana, this practice is not used.

Heddling and Reeding

Heddling and reeding with the traditional Kente weaving, heddling and reeding is done on either on the floor or on a table before it is fixed on the loom when one is using the traditional loom. Example is being displayed in plate 4.17.



Plate 4.17: Ashante kente traditional heddling process
Source: Researcher's Fieldwork, 2022.

After all these processes then the warp yarns together with the heddles and the reed is mounted on loom for the test weave to be carried out. Plate 4.18 and Plate 4.19 are pictures shown a mounted warp with a test weave.



Plate 4.18: Mounted integrated test weave process
Source: Researcher's Fieldwork, 2022.



Plate 4.19: Mounted integrated test weave process
Source: Researcher's Fieldwork, 2022.

After heddling and reeding the warp is mounted on the loom whereby it is tied to fly rod of the cloth rollers apron and stretched to a tension box or drag stone. The weaver then checks if everything was in order, for the actual weaving to start. Plate 4.20 shown the weaving process of the integrated fabric.



Plate 4.20: Weaving process of the integrated weave
Source: Researcher's Fieldwork, 2022.

4.2.2 Weaving Process of the Integrated Fabric

In order to demonstrate the integration of Fugu weave effects, in that of Ashante Kente weaving effects, plain weave of the fugu weave effect was integrated very well with the designs known in Kente weaving as Nsromma and Fahiakotwere Agyemang. With the plain, weave demonstrating its effects as to that of the fugu fabric and the designs as to that of the Kente weaving due to the heddling order and the reeding.

Plates 4.21 to 4.25 displaying Kente weave techniques integrated with Fugu weaving techniques.



Plate 4.21: Weaving process of the integrated fabric
Source: Researcher's Fieldwork, 2022.



Plate 4.22: Weaving process of the integrated fabric
Source: Researcher's Fieldwork, 2022.



Plate 4.23: Weaving process of
the integrated fabric
Source: Researcher's Fieldwork, 2022.



Plate 4.24: Weaving process of
the integrated fabric
Source: Researcher's Fieldwork, 2022.

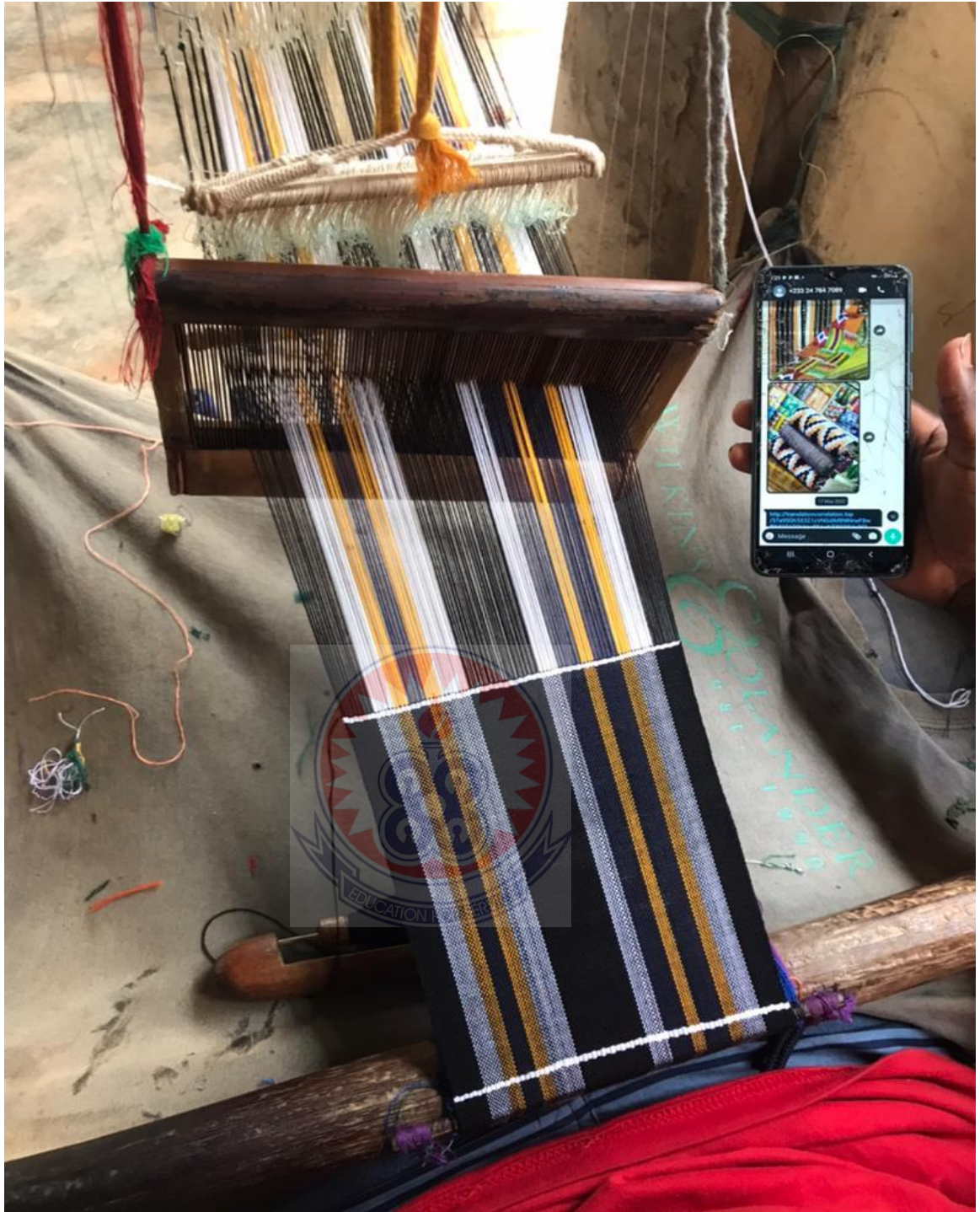


Plate 4.25: Weaving process of the integrated fabric
Source: Researcher's Fieldwork, 2022.

Pictures of the finished integrated woven strips displaying Kente weave techniques integrated with fugu weaving techniques Plate 4.26 to Plate 4.30.



Plate 4.26: The finished integrated weave (one)

Source: Researcher's Fieldwork, 2022.



Plate 4.27: The finished integrated weave (two)

Source: Researcher's Fieldwork, 2022.



Plate 4.28: The finished integrated weave (three)

Source: Researcher's Fieldwork, 2022.





Plate 4.29: The finished integrated weave (four)

Source: Researcher's Fieldwork, 2022.



Plate 4.30: The finished integrated weave (five)

Source: Researcher's Fieldwork, 2022.

4.2.3 Joining the Integrated Woven Strips into a Cloth

Joining of the integrated woven strips of Northern fugu and Ashante Kente were done to form the innovative integrated cloth.

Joining of the integrated woven strips was done by overlapping each strip of about 1/8 of an inch. They were then pinned, tacked and sewn with the zigzag stitches for smoothness. Tacked stitches were then removed after joining the strips together. In Plate 4.31 to Plate 4.35 is the joining and finished joined strip.



Plate 4.31: Joining of innovative woven strips.

Source: Researcher's Fieldwork, 2022.



Plate 4.32: Joining of innovative woven strips.

Source: Researcher's Fieldwork, 2022.



Plate 4.33: Joining of innovative woven strips.

Source: Researcher's Fieldwork, 2022.



Plate 4.34: Joining of innovative woven strips.

Source: Researcher's Fieldwork, 2022.



Plate 4.35: The final integrated woven cloth.

Researcher's Fieldwork, 2022.

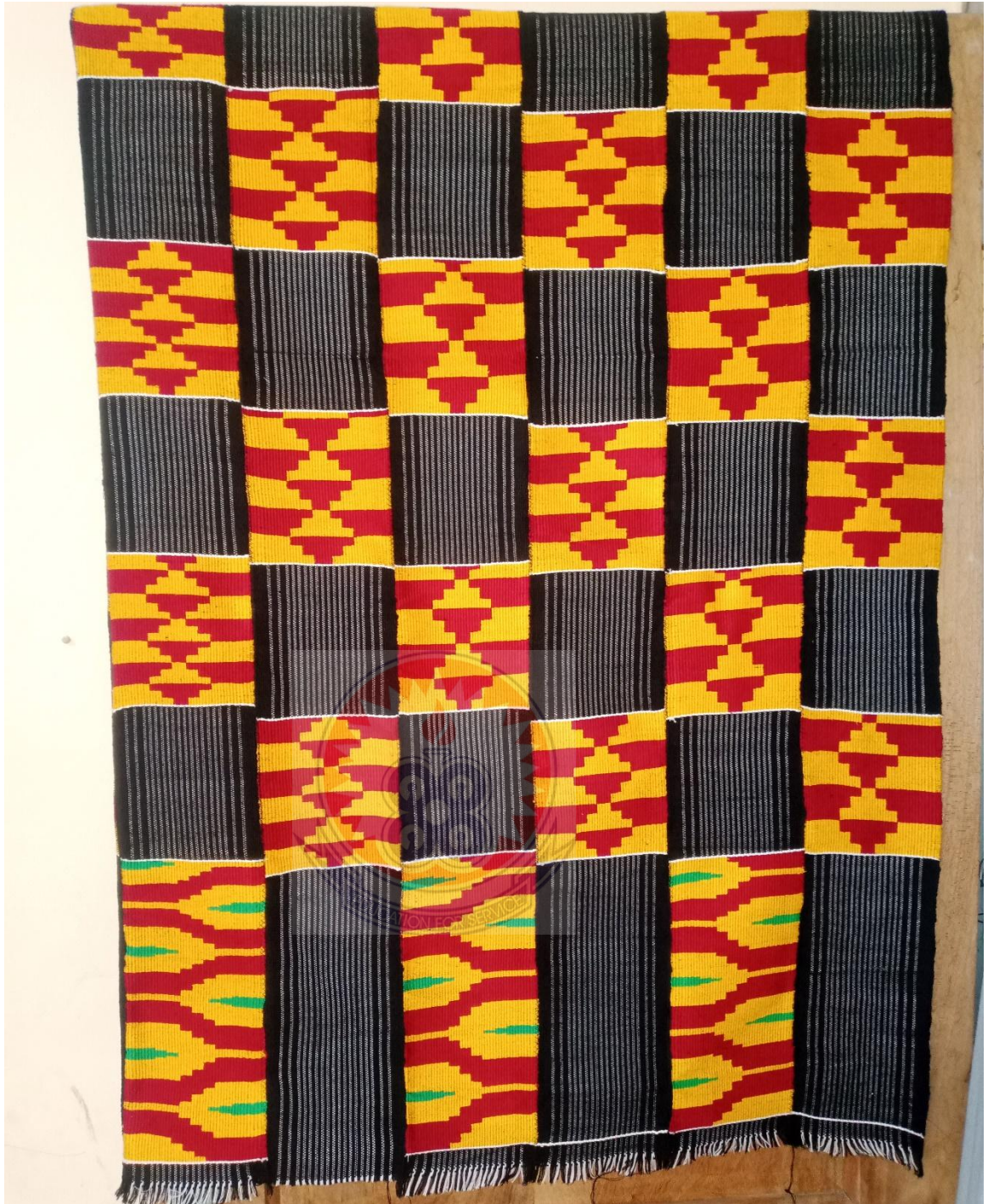


Figure 4.36: The final integrated woven cloth.

Source: Researcher's Fieldwork, 2022.



Plate 4.37: The final integrated woven cloth.

Source: Researcher's Fieldwork, 2022.



Plate 4.38: The final integrated woven cloth.

Source: Researcher's Fieldwork, 2022.



Plate 4.39: The final integrated woven cloth.

Source: Researcher's Fieldwork, 2022.

The processes involved in the creation of the integrated innovative fabric, indicates that unity can change the face of indigenous woven fabrics in the country.

4.3 Execution of Activities for Research Objective three

In order to evaluate the level of acceptance of the innovative weave structure produced, questionnaire was administered to respondents to collect data. The questionnaire contained four major questions, which the respondents were expected to tick the appropriate answer.



Figure 4.1: Level of acceptance, the colours of the weave designs

Source: Researcher's Fieldwork, 2022.

From Figure 4.1 the respondents were asked about the choice of colours of the integrated weave. From the data of the integrated weave, 36 respondents forming 36% considered the colours of the integrated weave as very good, 29 respondents representing 29% considered the colours of the integrated weave as excellent, 24 respondents constituting 24% considered the colours of the integrated weave as good,

7 respondents forming 7% considered the colours of the integrated weave as fair and 4 respondents representing 4% considered the integrated weave being poor. This is to suggest that majority of the respondents accepted the choice of colours chosen for the integrated weave designs.

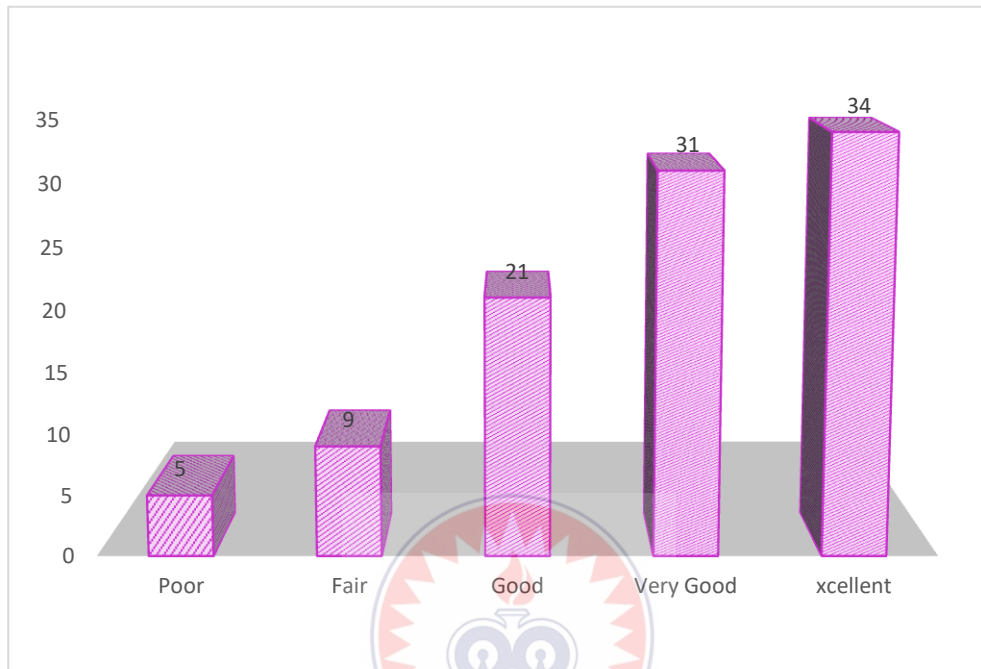


Figure 4.2: Level of acceptance, the structure of the weave designs

Source: Researcher's Fieldwork, 2022.

As displayed in Figure 4.2, a question was posed “what is the level of acceptance, of the structure of the weave design?”. From the data collection 34 respondents representing 34% answered that the structure of the integrated weave as very good, 31 respondents forming 31% answered excellent. However, 21 respondents constituting 21% accepted that the structure of the integrated weave as good. Again, 9 of them constituting 9% revealed that the structure of the integrated weave as fair the remaining 5 respondents constituting 5% asserted that the integrated weave structure

as poor. However, majority of the respondents accept the structure of the weave designs.

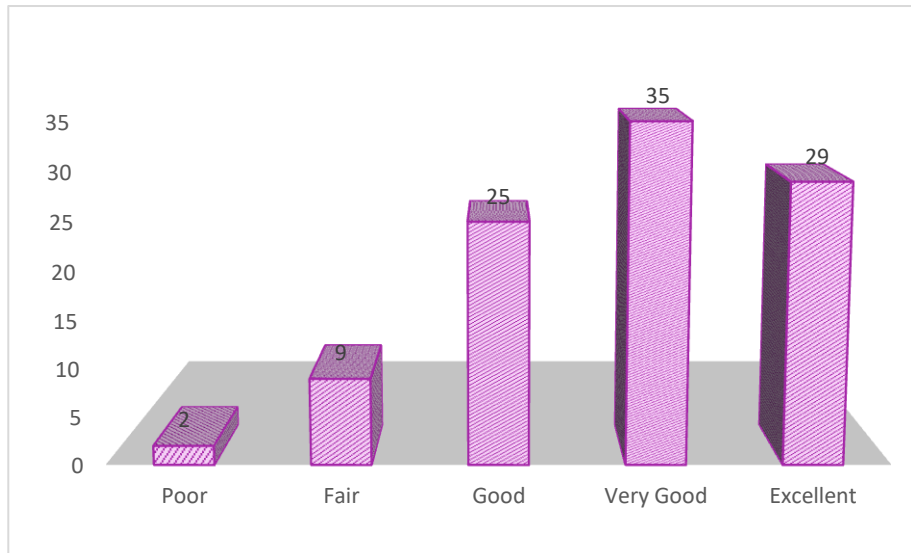


Figure 4.3: Level of acceptance, the concept of the weave designs

Source: Researcher's Fieldwork, 2022.

As depicted in Figure 4.3 the respondents were asked, the level of acceptance, of the concept of the integrated weave designs. This question tested whether the goal of this research was successfully realised and the respondents; answers are very encouraging. From the data collection, 2 respondents representing 2% answered that the concept of the integrated weave designs as poor, 9 respondents constituting 9% answered fair. However, 25 respondents representing 25% mentioned that the concept of the integrated weave designs are good. Again, 35 of them constituting 35% revealed that the concept of the integrated weave designs as very good. The remaining 29 respondents constituting 29% asserted that the concept of the integrated weave designs as excellent. In all, majority of the respondents support the concept of the weave designs.

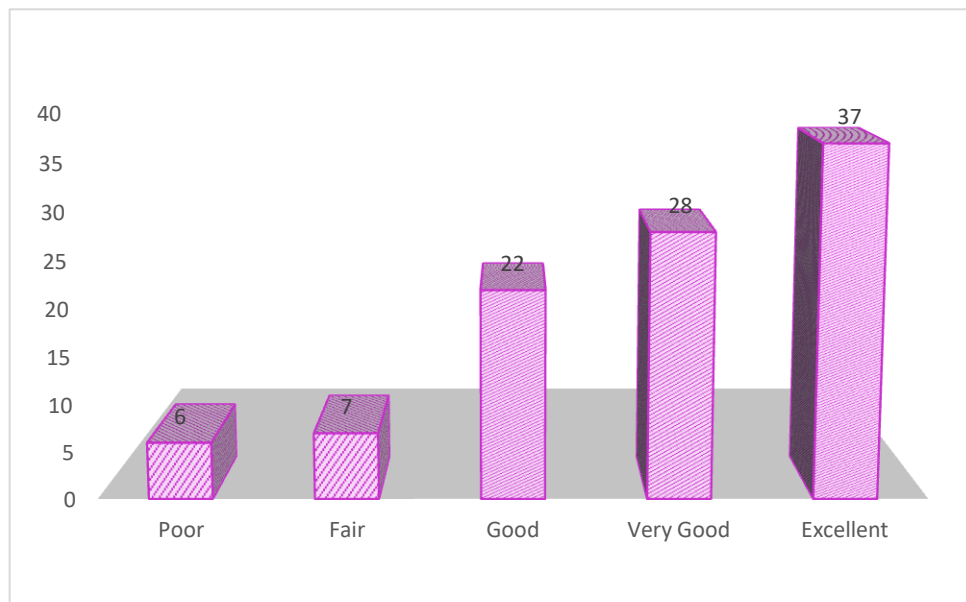


Figure 4.4: Level of acceptance, the general appearance of the woven cloths

Source: Researcher's Fieldwork, 2022.

As displayed in Figure 4.4, a question was posed “what is the level of acceptance, of the general appearance of the woven”. From the data collection 37 respondents representing 37% answered that the structure of the integrated weave as very good, 28 respondents forming 28% answered excellent. However, 22 respondents constituting 22% accepted that the structure of the integrated weave as good. Again, 7 of them constituting 7% revealed that the structure of the integrated weave as fair the remaining 6 respondents constituting 6% asserted that the integrated weave structure as poor.

This indicates that, most of the respondents like the general appearance of the integrated woven cloths.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The data received in the various weaving communities studied indicate an inherited instinctual expertise and skills that suggest a touch of modernism among fugu weavers who manage to combine the old and new values in their method of production. Traditional fugu and the modern fugu weavers still co-exist alongside the exportable, creative and innovative fugu products, which indicate that the peculiarity of fugu and the unique character of traditional weaving still persist with modernity that notwithstanding, there is a growing similarity between the traditional, and the modern fugu weaves. According to Asmah et al., (2015) the extensive interaction and the positive response from the general public, tourists and Kente weavers in these Kente communities are experiencing a unique and characteristic creative phase oriented towards meeting their collective needs as well as promote the Ghanaian rich cultural heritage.

Introducing the Kente into the fugu with both cloth unique traditional weaving characteristics and colour arrangements suggest a welcoming phase to the changing trends of the fugu and the Kente weaving industry. Thus, the pendulum of fugu designs being arrangements of warp patterns, and new techniques like patchy dyeing of the yarns before weaving to create designs, are tilting to meet the market demand, product orientation, based not solely on market tastes. Daboya in the Northern part of Ghana have traces of the dyeing technique in their yarn dyeing and patchy yarn dyeing culture which presupposes that they are introducing design in their weaves in

their weaving communities. This will go a long way to further promote the sustainability of the fugu and the Kente weaving industry. The end product of this project is aimed at the exuberant youth and the modern fashion industry who are already familiar with weaving. The basic tools and techniques of traditional fugu and Kente weaving remains the same. The new introduction is the systematic process of hand picking in or creating of motifs in fugu, and the introduction of thick plain weave into Kente strip weaving for fugu or kente stoles. The research adopted the plain, single and double design weaves for the project. The study revealed the unique effect of using patchy dyed yarns for weaving. According to the data gathered, both cloths have almost the same cultural significance and its consideration as cloth of wealth and prestige will definitely promote and sustain both the fugu and Kente weaving industry.

5.2 Main Findings

The researcher found out that the incorporating of Kente design motifs into the fugu weave has been good, but the outcome of the cloth was relatively good as compared to the already woven of both the Kente and the fugu weaving industry. The only problem encountered is that It o is nly that the produced cloth is heavy and fluffy but the characteristics of both cloth is achieved. In other words, the same designs of Kente can be reproduced and different motif apart from Kente motifs can also be produced. With small effort and time, nice and intricate Kente designs are produced due to the ply of yarns. The realization was that most show evidence fugu weavers do not know how to introduce design into their weave. Simple stroke of plain weave is sometimes introduced in plain weave technique with different colour to indicate something like a design. (See figure 4.2)

5.3 Conclusions

The cardinal principle of using Kente weaving design technique to produce fugu stoles have been successfully executed. Examining the outcome of the product prove the research was successful and has introduce, a new face into fugu and Kente weaving o

in Ghana. The physical test conducted to obtain a good abrasive, tensile strength and washing properties. Indications were that this process was feasible and appropriate in using blending the two techniques. It however, retained its cultural identity and managed to maintain traditional weaving techniques of both fugu and Kente. The study, therefore, offers a new platform for both fugu and Kente weaving industry to manipulate and enhance their skill of weaving. The uniqueness of this art, introducing Kente weaving designs into fugu weaving will help inject new enthusiasm and growth in the cotton production industry in Ghana to facilitate the weaving industry.



5.4 Recommendations

Based on the findings, the following recommendations have been made for implementation by both the yarn dyers and the producers of Kente in Ghana.

1. The creative way of introducing the weaving of design into fugu must be encouraged and practised in all educational institutions to help empower and enable the spread and preservation of this knowledge for posterity.
2. Weavers of both fugu and Kente are to collaborate with one another in our local industries to help broaden the idea of production. how
3. It is recommended that investigation be made with the northern dyers as to how to introduce dyeing of Ashante colours for easy acquisition and production.

4. The Ministry of Tourism in collaboration with the Ministry of Trade and Industry, and the Departments in tertiary institutions learning these skills should organize workshops, seminars and conferences to educate weavers and dyers in our locality to help improve and boost the fugu and Kente weaving industry as well as the tourism industry.
5. It is recommended that a wellness resource centre be established to preserve, improve and invigilate the fugu and the Kente weaving industry in Ghana as the world keeps on changing.



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APPENDIX**UNIVERSITY OF EDUCATION, WINNEBA****QUESTIONNAIRE FOR ASANTE KENTE AND NORTHERN FUGU WEAVERS**

Dear Sir/Madam, this study is being undertaken by a student from the University of Education, Winneba Kumasi Campus, on the innovative weave structures' integrating the Asante kente into the Northern fugu weave.

This is intended to evaluate the finished woven fabric, to know how it's colours of the design, structure of the weave design, the concept of the weave design and the general appearance of the woven cloth will be accepted by the fugu and kente weavers.

SECTION I: Level of acceptance, a blend of Asante kente and Northern fugu weave.

Please rate using a scale of 1-5	Poor	Fair	good	Very Good	Excellent
	1	2	3	4	5
The colours of the weave design					
The structure of the weave design					
The concept of the weave design					
The general appearance of the woven cloth					