THE FUSION OF AN IKAT YARN DYEING WITH ASANTE TRADITIONAL KENTE WEAVING

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DECLARATION

I hereby declare that this submission is my own work towards the Master of Philosophy in Integrated Art and that, to the best of my knowledge, it contains no material previously published by another person, nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text

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ABSTRACT

This subject tries to investigate the extent to which an integration of an Ikat patchy yarn dyeing decoration technique introduced into Ashanti *Kente* weaving tradition to effect an innovative *Kente* cloth production. This concept provides an opportunity to help the *Kente* weaver learn yarn-dyeing embellishment prior to weaving to minimize the shortage of specific colours needed any desired production. The study reviews existing work on *Ikat* yarn dyeing techniques, practices in the ancient countries like Indonesia, India, Japan, to mention a few and traditional *Kente* weaving practices in Ghana. For how the two aforementioned traditional weaving practices, examined wee integrated and how these two techniques can blend effectively to produce a unique cloth. The approach of the study was qualitative in nature and the instrument used to collect data were mainly interviewed (one-to-one) and participant observation with players in the traditional *Kente* weaving industry, dyers of cloth, yarns in addition to any secondary data. The scope of the study covered selected indigenous textile centres in the Ashanti region of Ghana. The population of the study was limited to five dyers, in which Bepoase (3), Ntonso (1) and Tewobabi (1). Forty-five weavers mostly from *Adawomase* (12), *Bonwire* (17), *Onno* (7), and dyers from *Bepoase* (1), *Ntonso* (5) and *Tewobabi* (3). The concepts under investigation included the dyeing affinity of rayon yarns with vat dyes and its ability to withstand abrasion resistance and tensile strength during the weaving processes. The patchy dyed effect on the warp and weft yarn had a strong impact on the traditional *Kente* weaves and this suggest that the fusion of *Ikat* yarn dyeing technique into traditional *Kente* weaving introduces a profound new face of *Kente* in Ghana. It became evident from the study that the traditional weavers previewed to the good practice of dyeing yarns into any preferred colours without any difficulties like bleeding or poor yarn dye affinity were eager to introduce the new concept.

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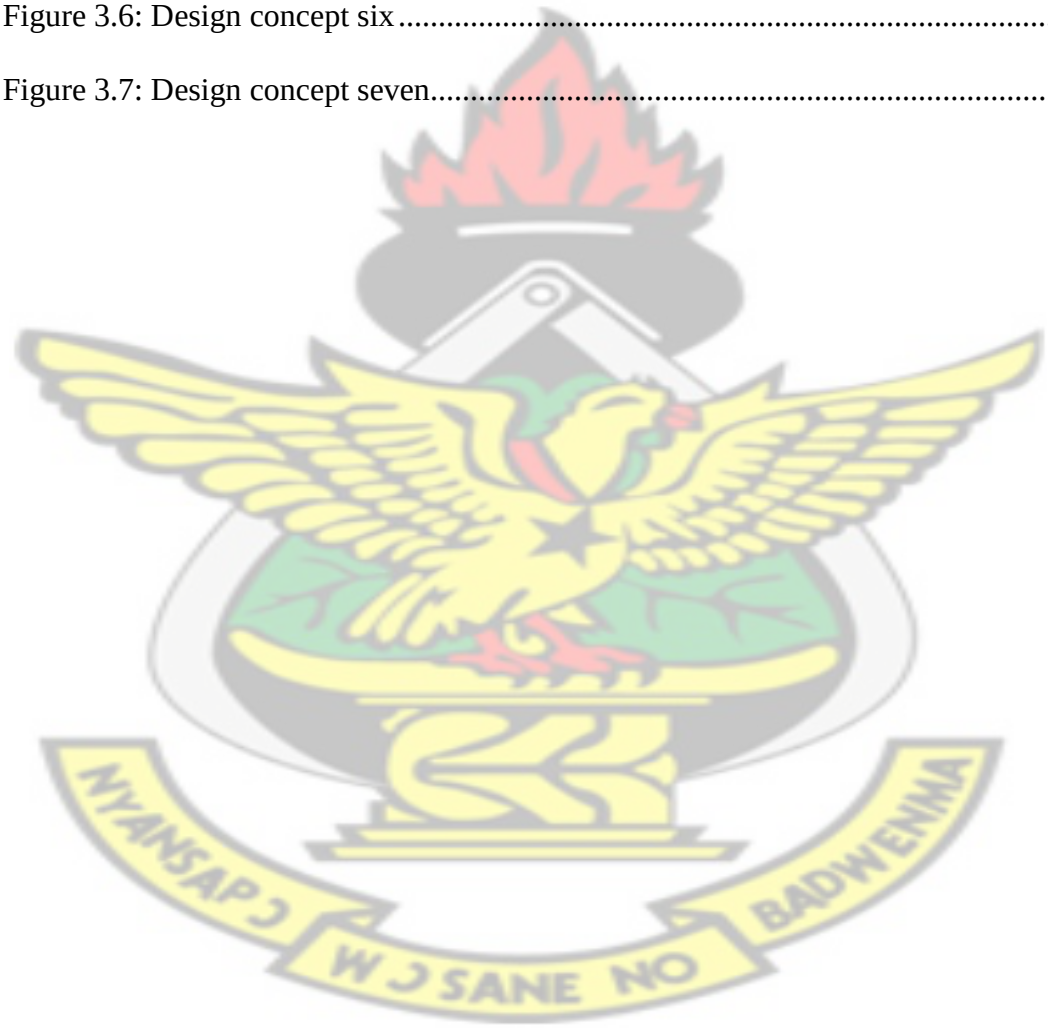

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CHAPTER ONE

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 of the Study

Sumberg, (2010) explains that textile fabrics comprises of a number of methods either woven, felted, knitted, or crocheted. Fabric decoration techniques involve dyeing, embroidery, and other stitches like appliqué, quilting with either leather, beads, metal, lace, ribbon or other decoration materials. Colours may be introduced to yarns during the spinning process or prior to Cloth weaving using varied dyeing techniques. The study attempts to introduce a patchy yarn dyeing decoration method prior to Kente weaving.

Kente weaving has its origin in the Ashanti kingdom adopted by the people of Ivory Coast and many other West African countries. It is an Akan royal and sacred cloth produced for only kings in the past was worn only in times of extreme importance. Over time, the use of Kente became more widespread. (Manning, 2010). The Akan Kente were held in high esteem, considered as an icon of African cultural heritage around the world, identified by its bright dazzling multi-coloured, and geometric patterns (Picton, 1989).

Kente, over the years, has undergone numerous dynamic changes through the varied use of material types, colour and weaving techniques. Currently the dynamism of *kente*

development seems to be stalled with little variation in design weaves. The researcher in an attempt to break away from the norm seeks to introduce and adopt the *Ika*t yarn decoration technique into *Kente* weaving to usher in a new yarn aesthetic decoration technique as a platform for improving *Kente* decoration in the *Kente* weaving industry.

Ikat, or *Ikkat*, a weaving technique or a style of weaving that uses a resist dyeing process similar to tie-dye on either the warp or weft before its use to create a woven design pattern. A Double *Ikat* is when both the warp and the weft are tie-dyed before weaving. Like any craft or art form, *Ikats* vary widely from district to district, region to region and country to country; in areas like Bali, Cambodia, Central Asia, India, Indonesia, South-East Asia, Japan and Guatemala. *Ikat* probably developed in several different locations independently and so it is extremely difficult if not impossible to determine where the technique originated. Like *Kente* cloth, *Ikat* clothes are often made to depict symbols of status, wealth, power and prestige. Perhaps due to the difficulty and time required to make *Ikats*, some cultures believe the cloth is imbued with magical powers.

Its production is also known in African countries like Mali and Nigeria but little is known in Ghana. Lartey (2014) explains that small technique of patchy dyeing is being introduced by weavers in the northern region of Ghana.

Before the warp strings are attached to the loom they are arranged into bundles. Each bundle is tied and dyed separately, so a pattern emerges when the loom is set up. This takes a good deal of skill. The tightly bound bundles are sometimes covered with waterproof materials, plastics, wax or any other material that keeps the dyes from penetrating into the yarns in corresponds to the planned design. The process is repeated several times for additional colours. The pattern is visible to the weaver when the dyed

threads are used as warp. Threads are then adjusted so as to line up correctly with each other. Dyeing the weft however, makes the precision of *Ikats* patterns much more difficult. Double *Ikats* are the most difficult to produce due to the careful tying of threads or application of resist needed to achieve a meticulous arrangement of warp and weft thread for weaving.

History and research have proven that *Kente* has undergone adjustability and adaptability that enrich its total cultural sphere. But nothing like the above mentioned technique have been introduced. In combining the names of these two cloths, this innovative form of *kente* cloth can be named as *IkKente* referring to, the merging of the dyeing and weaving techniques into a new cloth. This studio based research involved the experimental and the practical base investigation. The research approach was measurable but to some extent qualitative.

1.3 Statement of the Problem

Having observed the *Kente* weaving, notwithstanding its cherished nativity and distinctiveness needs a new direction of research. Though *Kente* has undergone dynamic changes; where warp has been patterned, warp yarns doubled, stamped with ink or dyes with *Adinkra* designs and some portion of warp yarns selected to partake in the interlacing process and some portions not interlaced, all aimed at the beautification of its finished clothes and the improvement its aesthetic appeal, patchy yarn dyeing has not been introduced in the *kente* industry.

Patchy yarn dyeing introduced in fabric production via weaving is mainly practiced in the Ancient countries like Pre-Columbian, Peru, Guatemala, Japan, Indonesia, India and Uzbekistan. With *Ikat*, tie warp and weft sheets are resisted into design forms and

dyed prior to weaving for the proposed design to emerge. Before the dyeing process, the warp yarns are beamed or stretched onto the loom, and arranged into bundles. Each bundle is tied and dyed separately in desired colours by the weaver, to unveil the intricate design patterns when the loom is set up. This requires a skillful weaver to do that. Sometimes the tightly bound bundles are covered with wax or wrapped with some other material like plastic bags that prevents the dyes from penetrating into such resist portions of the yarn. This process is repeated several times if additional colours are needed.

Though tie dyeing of the weft and the warp to produce precise patterns for the *Ikat* weave is much more difficult, it brings some uniqueness into the fabric woven. As weft is woven back and forth, at the initial stage, the weaver cannot determine its exact position when some portions are dyed. However, it is known that weft *Ikat* technique is produced when the precision of pattern is not the main notion. This technique helps produce unequal and unpredictable patterns.

Based on the same concept of *Ikat* yarn dyeing, different yarn coloration techniques like the *Ikat* warp and weft yarn, tie dyeing techniques were incorporated into the traditional *Kente* weaving process to produce a unique cloth known as "*IkKente*". As Yulo, (2015) said *Ikat* weaving is usually a woman's occupation in Southeast Asia. This is a motivation for our women to gain much interest in our traditional weaving when introduced. Though *Ikat* is mostly woven on the back-strap loom, the researcher used the traditional *Kente* (*Kofi Nsadua*) loom for the weaving. According to Gilfoy, (1987) throughout West Africa, weavers have adapted foreign elements to suit their needs, creating unique motifs to express culture values.

In the same vain introducing an aspect of *Ikat* decoration technique into *Kente* weaving rooted in its own tradition does not alter its tradition, but rather strengthen its cultural traditions by cooperating the two traditional concepts towards acculturation.

Kente has evolved through dynamic changes from plain or single colour weaving to abstractions of forms to geometric forms of naturalistic patterns, to an entirely double weave design, limited exploration has been done on tie dying of the weft and the warp sheet yarn prior to weaving. Hence, the employing of the *Ikat* (tie-dye) patchy technique fusion into traditional *Kente* weaving.

1.4 Purpose of the Study

To design and produce an Asante traditional *Kente* by adapting the *Ikat* yarn weft and warp sheet dyeing decoration technique.

1.5 Objectives of the Study

1. To investigate into the *Ikat* decorative method of yarn dyeing.
2. To design and produce a woven fabric by employing both the *Ikat* weft and warp yarn sheet dyeing and the *Kente* decoration techniques.

1.6 Research Questions

1. What are the decorative methods employed in *Ikat* yarn dyeing?
2. How can a woven fabric be designed and produced, using both the *Ikat* yarn dyeing and the *Kente* weaving techniques?

1.7 Importance of the Study

This will bring diversity and innovation into the *Kente* weaving industry in Ghana. It will also be a body of knowledge that will serve as reference for other researchers.

1.8 Delimitation

This study was limited to *Ikat* weft and warp sheet yarn tie dyeing techniques and *Kente* weaving techniques. It was also limited to the use of vat dyes for dyeing, raffia and traditional looms for weaving. Geographically the study was also limited to *Adawomase, Bonwire. Bepoase Ntonso, Onoo,* and *Tewobabi* weaving and dyeing communities in Ashanti region Ghana.

1.9 Definition of Terms

***Ikat*:** a weaving technique whereby weft and warp sheet yarns are patchy dyed prior to weaving.

***Kente*:** *Kente* is a narrow strip cloth woven on a traditional loom, with colourful geometric shapes in abstract and realistic forms of animals, trees and many others as motifs with philosophical interpretations that gives the symbolic connotation to the entire cloth.

***Ike-kente*:** a woven fabric produced out of a combination of a yarn colouration technically referred to as *Ikat* with a traditional *Kente* woven technique**.**

1.10 Organisation of the Study

Chapter two contains a review of related literature. The research method, the population used, the sampling as well as data collection instruments and the treatment of the data were expounded in Chapter three. Chapter four is the presentation of results and discussion. Lastly, Chapter five covers the summary, conclusion and recommendations of the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Overview

The chapter reviews literature related to the study, which covers the concept of *Ikat* and *kente*.

2.2 History of *Kente*

The origin of *Kente* explains with both a legend and historical accounts. Historical accounts trace the origin of *Kente* weaving to early weaving traditions in ancient West African Kingdoms that flourished between 300 A.D. and 1600 A.D. A legend has it that two men named *Ota Kraban* and *Kwaku Ameyaw* from the town of *Bonwire* (the originators of the leading *Kente* weaving centre in Ashanti -Ghana), acquired the art of weaving by observing a spider weaving its web in the bush. According to Asmah, (2004) and Ewudzie-Sagoe, (2011), after they went home and taking a cue from the spider, they made the first cloth out of black and white fibres from a raffia plant and later improved upon their skill. They reported their discovery to the chief of *Bonwire* (about 20 kilometres from Kumasi and about 9 kilometres from Ejisu in the Ejisu – Juaben District) the leading *Kente* weaving centre in Asante, *Nana Bobie,* who in turn reported it to the Asantehene (The Ashanti Chief) at that time. They were so impressed that, the Asantehene adopted it as a royal cloth and encouraged its development as a cloth of prestige reserved for special occasions. Up to present *Kente* is still cloth for occasions (Atsutse, and Apoh, 2015). It has its roots in a long tradition of weaving in Africa dating back to about 3000 B.C. Some historians maintain that *Kente* is an outgrowth of various weaving traditions that existed in West Africa prior to the formation of the Ashanti Kingdom in the 17th Century. Archaeological research has

dated examples of narrow-strip cloths woven in West Africa as early as the 11th Century A.D. and perhaps earlier. Some examples of woven fabrics have been found in the caves of the Bandiagara cliffs in Mali. These cloths used in burial ceremonies, probably, during the medieval Ghana, Mali and Songhai Empires, have technical and aesthetic features similar to many of the narrow-strip cloths in many parts of West Africa. Such cloths which the Akan's call "*Nsaa*" are important components of scared royal paraphernalia in most Akan royal courts today and are known to have been traded with articles of prestige by Akan Kings and chiefs early in the 17th Century.

The history of *Kente* weaving extends back more than 400 years. The word "*Kente*" comes from the word "*Kenten*", which means basket. The very first *Kente* weavers used raffia, or palm leaf fibres, and wove them into a cloth that looked like a basket. Thus the arrival of the name "*Kente*".

There are more than 300 different weaving patterns of *Kente* cloth. Each weaving pattern has a name and its own meaning. The meanings come from past events, religious beliefs, political ideas, and social customs. To this day, *Bonwire* is still the most well known centre for *Kente* cloth weaving in Ghana.

The *Kente* cloth is one of the most famous and desired fabrics in the whole world. *Kente* has evolved greatly since it was first produced. The *Kente* intended to be worn solely by kings, chiefs often wear the bright cloth to festival ceremonies, and dark and red coloured cloth or white and black colours at funerals. The use of *Kente* has become widespread and now being used for casual wear, often made into bags, sandals, and shirts for commercial sales, which has become a bother to the custodians of *Kente* (the Asantehene). However, its importance has remained and still held in high esteem

among the Akan family as well as the entire country. This prestigious *Kente* cloth is now worn by anyone in Ghana or elsewhere disregard less of his or her status.

The *Kente* fabric has seen many changes over the past few centuries. In the early years, all of the thread used to produce *Kente* was made from silk. Today, the *Kente* fabric is made from rayon, cotton, and linen, making it affordable for a greater number of people. New patterns with new meanings easier to produce are constantly designing, but many of the original patterns are also still in use (Boateng, 2011).

Kente was the cloth of kings in the olden days. As time goes on, the use of *Kente* became widespread even is coming out as a casual wear, however, its importance has remained and it is held in high esteem in the Akan family and the entire country. In Ghana, *Kente* is made by the Akan people (including the Asante, *Fanti* and *Nzema*) and the Ewe's. *Kente* also produced by Akan groups in Cote D'Ivoire, like the *Baoule* and *Anyin*, who trace their heritage back to Ghana before the rise of the Ashanti Empire. It is the best known of all African textiles. *Kente* comes from the word '*Kente*n', which means "basket." *Kente* also referred as *Nwentoma* or "woven cloth" by the Asante peoples of Ghana. According to Asmah (2004), *Nana Kwasi Gyanfi* agrees with the legend that, a man named *Ota Kraban* and his friend *Kwaku Ameyaw* from *Bonwire* (about 20 kilometres from Kumasi and about 9 kilometres from *Ejisu* in the *Ejisu* Municipality,) the leading *Kente* weaving centre in Asante learned the art of weaving by observing a spider weaving its web. The *Kente* cloth is one of the most famous and desired fabrics in the whole world. The above literature proves that *Kente* has evolved in so many ways since it came into existence and this study is to explore and bring new idea.

2.3 The Cultural Aspect of Kente

Kente fabric is more than just clothing to wear. For the Ghanaians, this represents the history, philosophy, oral literature, religious beliefs, political thought and aesthetic principles of life (Mills, 2009). *Kente* is a cloth woven in narrow strips on a traditional loom, colourful with geometric shapes, sometimes with abstract forms of animals, trees bearing meanings of such motifs and philosophical meanings behind the whole cloth.

No gathering, feast or festival will be celebrated without the display of *Kente*. It has become an iconic cloth for the Ghanaian Akan's, and the Ewes, and most Africans in the diaspora. In the olden days, cloths were designed and wove to honour chiefs and dignities like Queens and presidents on a special official visit in Ghana. To commemorate Queen Elizabeth visit to Ghana, a new woven cloth known as '*Ohemma Aba* 'Ghana was presented to her majesty.

The same applied to former President Clinton and his wife when they visited Ghana, Rawlings, the former president, presented them with a woven *Kente* cloth named after Clinton. Below is a picture showing Former U S president Clinton and wife in Plate 2.1

Plate 2.1: President Rawlings Honouring President Clinton and wife with *Kente*
(Source: https://www.google.com/search)

To praise the first president of Ghana for marrying a beautiful wife, weavers outdoor the cloth with blue background and named after Mrs. *Fatia* the then first lady of the land of Ghana. The cloth was named *Fatia Fata Nkrumah* meaning Mrs. *Fatia* was nice beside President Nkrumah as wife this was to praise their union as marriage couples picture of such cloth shown in Plate 2.2. When the same president was overthrown in a coup d'état, a woven cloth was done with the same designs but with a black background and named as *'Ɔbaakofoɔ mmu mman'* meaning one man does not rule a nation this was to explain that he was autocratic leader that is why he was overthrown picture shown in Plate 2.3.

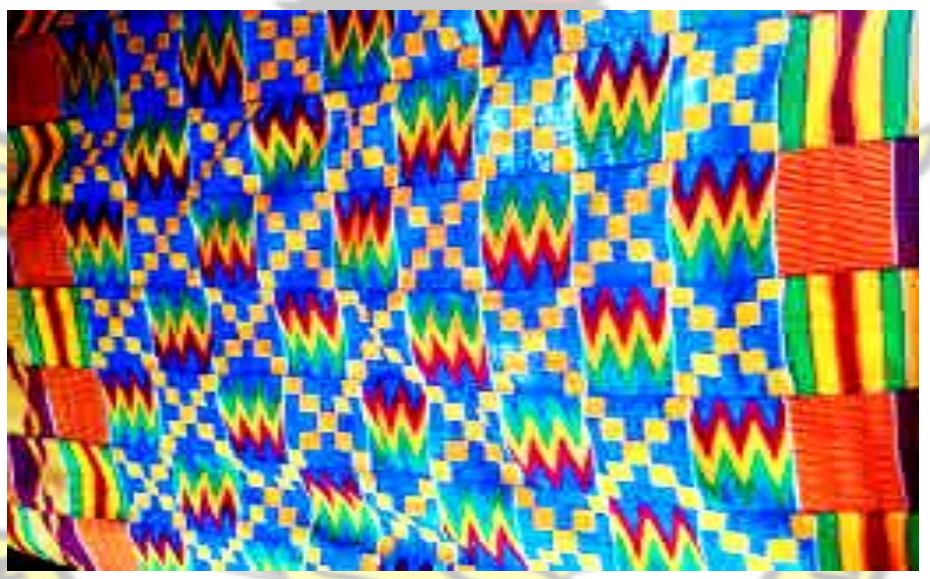

Plate 2.2: Fatia Fata Nkrumah
(Source: https://www.google.com/search)

Plate 2.3: Ɔbaakofoɔ mmu mman
(Source: https://www.google.com/search)

Though colours are combined for beautification purposes, it is also used philosophically as all colours have their own symbolism (Asmah, and Okpattah, 2013). Colouration in conjunction with motives gives philosophical meanings to *Kente* cloth. *Kente* is not woven without prior motives. The above theories about weaving cloth with different colours in relation to its specific events, proves that symbolic colouration is quite important to the weaver as colour help change names with philosophical connotations in *Kente* weaving. Symbolism of colours is therefore important to the weaver when planning for the weaving.

The various colours in the cloth symbolize various aspects of life. Blue symbolizes peace and harmony. Gold colour mostly worn by kings in ancient times symbolizes royalty, power, esteemed status, spiritual purity and holiness. High priest of ancient times and today used colours like this. Pink and purple colours are associated with women. White and grey colours symbolize sanctification, holiness, cleansing rituals and are mostly used by priests and holy people. All these colours are used to compose

patterns which, when interpreted speak about situations or occasions. Because of the use of *Kente* at different occasions, it has led to the invention of many patterns.

Names of *Kente* clothes are chosen not only by the colours, but by the arrangement of the warp pattern as well. Although the cloths are identified primarily by the patterns found in the lengthwise (warp) threads, there are often little correlation between appearance and name. As stated earlier *Kente* cloths were named after kings, president, events and many more, but Names of the motifs are derived from several sources, including proverbs, historical events, important chiefs, queen mothers, and plants, animal objects and composed within a philosophical context.

Kente cloth is not only catalytic in consolidating social relations, it is also invested with meanings, communicates identities and values. As defined by Ross (1998) in "wrapped in pride" that *Kente* is a ceremonial cloth, *Kente* fabric is usually worn for festivals, and other sacred occasions as well as gifts for weddings, child naming, graduations, and other special events.

Women wear the cloth in three (3) pieces most especially in the olden days. One (1) piece made of two (2) yards long and forty five (45) inches wide. One piece is sewn to be worn around the waist in a skirt form popularly known as stretch and another in a blouse form popularly known as "*Kaba"* whilst the other piece being the third is sewn, but rather worn around the waist over the stretchy or skirt. Nowadays they are in two (2) pieces. The two (2) pieces of the cloth are the same in measurement explained earlier, but one is not sewn in the form of a stretch, but rather wrapped round the waist to form a floor-length skirt worn over one (1) piece blouse specially sewn in plain material. The other *Kente* piece was either hang loosely over the arm or used as a headpiece or stole. This is popularly known as "*Alata*" style.

Women sometimes wear it in two pieces known as "dancing crown". With this, the cloth is produced in two pieces, but this one a piece is worn over the upper part of the body, is produced in bigger sizes than the normal two (2) yards of the normal forty five (45) inches. With this one, the bigger piece is mostly measured three (3) yards by sixty (60) inches wide. The queen mothers normally wear clothes like these. Sometimes, three (3) yards are worn the same way on different cloth. That is a queen mother in dancing crown wear in Plate 2.4 with a display of *Kente*.

Plate 2.4: Display of dancing crown
(Source: https://www.google.com/search)

Men usually wear one big piece wrapped around the body, leaving the right shoulder and hand uncovered, similar to how the woman has displayed in the above picture. However, the difference is men wear four yards in length and two and a half yards (2 $^{1}/_{2)}$ in width that is, if the width is four (4) inches per strip, then twenty four (24) strips will be needed for a man's cloth on the average. Below is a plate with a picture of how men wear their piece.

Plate 2.5: A man dressed with *kente*
(Source: ttps://www.google.com/imgres?imgurl)

Sometimes men wear a '*Jampa*', a kind of collarless shirt over which the cloth is wrapped on. This was evidently emphasized by the late president of Ghana, Dr. Kwame Nkrumah. Below is a picture of the late president in Plate 2.6.

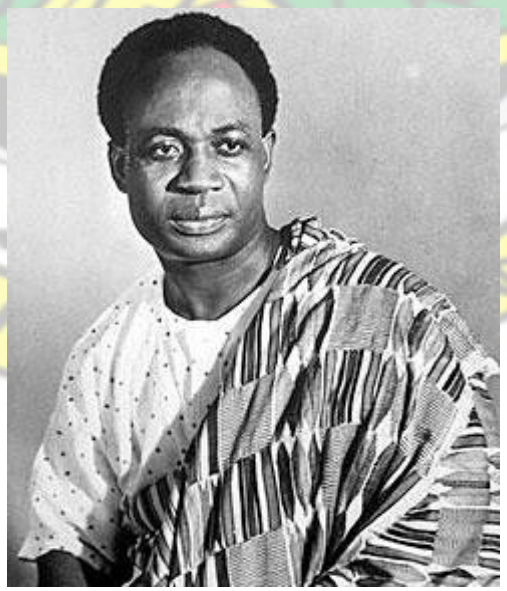

Plate 2.6: The late President in Kente
(Source: https://www.knust.edu.gh/about/knust/history/kwame-nkrumah)

2.4 The Current Trends of Kente

The various weaving communities, namely *Bonwire, Adawomase, Tewobeabi, Ntonso,* and *Onno* studied indicate an inherited instinctual expertise and skills that suggest a touch of modernism among *Kente* weavers who manage to combine the old and new values of *kente* production (Asmah et al, 2015). Traditional *kente* and the modern *kente* weaves still co-exist alongside the exportable, creative and innovative *kente* products which indicate that the peculiarity of *Kente* and the unique character of traditional weaving still persist with modernity (Asmah et al, 2015). This, notwithstanding, there is a growing similarity between the traditional and the modern *kente* 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 experience a unique and characteristic creative phase oriented towards meeting the collective needs as well as promote the Ghanaian rich cultural heritage.

2.5 *Ikat* Fabric Decoration Techniques

The research seeks to introduce the tie-dye technique of yarn embellishment into *Kente* fabric decoration. The *Ikat* fabric decoration methods were reviewed to identify the relevant technique that is applicable to the *Kente* method of production and identify additionally its similarities to that of *Kente* weaving.

The name *Ikat*, or *Ikkat*, is a process as well as a style of weaving that uses a resist dyeing process similar to tie-dye on either the warp or weft before the threads are woven to create a pattern or design. *Ikat* is a yarn resist dyeing, which involves the sequence of tying (wrapping) and dyeing sections of bundled yarn to a pre-determined colour scheme or pattern, prior to weaving. Thus, the dye penetrates into the exposed sections, while the tied sections remain un-dyed. At times, the dye forces itself to

penetrate through the tied section due to the method of tying and material used in tying. The patterns achieved by the process on the yarn are then woven into fabric. This process involves careful sorting of threads before and after dyeing. If one wants to achieve results whereby the pre-dyed sections appear in the right places in the design, then the warp and the weft threads have to be arranged meticulously. The term *Ikat* originates from Indonesian word known as '*meningkat*'. In Japan, it is termed as '*Kasuri'*. Is Malay word meaning to "tie or bound". Though *the Ikat technique* uses tie-dye and wax resist process, here the resist is applied not to the woven fabric, but to the weft or warp sheet yarn before it is woven. Both in Japan and throughout the world, *Ikat* or *Kasuri* dyed textile designs have been most often abstract or geometric forms. The origin of *Ikat* is not well known as in 2000 BCE Austronesians came into Papuans of New Guinea and in the 1st-3rd century *Ikat* fragments was said to be found in Berenike, Red Sea and Egypt.

Austronesians of Madagascar practice *Ikat* weaving. Madagascans use indigenous silk, bark, raffia and hemp to weave their *Ikat* cloth. Silk *Ikat* shawls are called '*Lamba*' in Madagascar. *Ikat* was recorded in 939 CE in Java and has been dated from the fourteenth century on an archaeological site in the Philippines (Banton Island). The antiquity of *Ikat* can be traced to the period before the expansion of the Austronesians to the Pacific as these areas have dyed loom-weaving practices, but no *Ikat* weaving and after Austronesians made contact with Papuan communities in New Guinea.

Like that of *Kente*, *Ikat* is also a ceremonial cloth, which relates to a major life event and everyday wear. It is known for its intricate designs. The intricacy of the design determines how prestigious and valuable the fabric is. Such weaves are reserved for high-ranking members of the society.

Traditional colours used for *Ikat* weaves are usually colours of red, black, yellow, blue, brown and shades in between the under mentioned colours. Colours are consciously mixed to get specific colours or shades, but sometimes some colours run into some colours to form a unique colour unpredictably. This is achieved mainly with the method of production if one understands and caring practices the following method of *Ikat* fabric production.

There are four methods of *Ikat* fabric production process identified. The first is the warp *Ikat*. With this, only the warp yarns that run lengthwise of the fabric or pattern dyed or patchy dyed living the weft or the crosswise yarns in a solid colour form. This was said to be commonly found in Maritime Southeast Asia. Weft *Ikat* is the opposite of the warp *Ikat*. Here only the weft yarns or the yarns that run crosswise of the fabric is patterned dyed or patchy dyed living the warp in a solid colour.

This is known to be Indian attribute, but there are writers who attribute them it to Bali and Java it is said to be present among the Tai speaking people Vietnam and Laos. It is believed that weft *Ikat* was introduced from India to South Asia during the 14th to 15th centuries. In mixed *Ikat* of warp and weft *Ikat* both the warp and the weft are patterned with tie and dye, but not specific patterned is produced in areas where the dyeing's coincides. Finally, there is double *Ikat*, in which both the warp and weft are dyed in the same pattern. With this, the pattern comes into alignment when woven.

Ikat fabrics are mostly known in abstract and geometric forms, but artisans in Japan are known of producing pictorial scenes in *Ikat* fabric. Japanese designs are designed on futons, sleeping blankets and jackets. Motifs are also associated with the values of the community and a way of life of the community can be inferred from the motifs. Many of the motifs are created with inspiration from nature. Ancient *Ikat* motifs are imbued

with spiritual significance among Austronesians. A prominent and notable figurative zoomorphic representation is the crocodiles. Fear and awe of crocodiles have a deep spiritual significance for Austronesian communities. The orthomorphic representation is suggested as depictions of the victims of headhunting activities. However, the representation of female forms suggests otherwise, as only males are the target of such activities. In other literature, the representation of people in *Ikat* is associated with ancestor worship. (Reyes, 1992).

Women in Mexico and South America where Cotton was introduced and replaced abaca (Musa textilis) in many countries where *Ikat* was practiced mostly do this weaving tradition. Development of Songket use of Metallic threads in *Ikat*. In the 5th century CE, silk was introduced in *Ikat* weaving this was done by lowland cultures (Bali, Java, Sunda and Mindanao).

2.6 Similarities and Differences of Both *Kente* and *Ikat* Fabric

The above literature has shown that both fabrics have almost everything in common, they are all woven on the loom, they all play a significant role in the garment, status, wealth and as spiritual symbols. The only difference is mostly men in Ghana weave *Kente* whilst women in the Ancient countries do *Ikat*. A similar *Ikat* weaving effect is known to be practiced by Northern Ghana weavers specifically Daboya smock weavers. The example of their product is displayed on Plate 2.7. Here, instead of tie-dyeing the warp or the weft yarns prior to weaving, the woven strips like any other clothes are tied at certain intervals and dyed without wetting the strip before dyeing. They are later dried and sewn together. The effect is obtained on the woven strips, due to the avoidance of wetting before dyeing and this process creates the patchy effect seen in some *fugu* fabrics.

Plate 2.7: Daboya patchy dyed *fugu*
(Source: https://africanlegacyshoppe.com/products/african-*batakari-fugu*)

Kente is *woven* on loom known as *Kofi Nsadua* whilst *Ikat* is mostly woven on the back strap loom. Mercerized cotton yarns or yarns with high tensile strength properties are used for *Ikat* production. *Kente* is also known for producing mainly with cotton and rayon yarns with low tensile strength properties as comparable to that of *Ikat* production. This research introduced rayon threads as its main yarn material for tie-dyeing just as weft and warp sheet yarn decoration techniques are used in *Ikat* before the weaving of *Kente*. The use of the traditional *Kente* looms (Kofi Nsadua) was used instead of the back strap loom used for *Ikat* weaving. The incorporation of the patchy dyeing technique into traditional *Kente* weaving, in addition to the procedure of achieving this effect is seen in the next chapter.

2.7 The Concept Fusion

Fusion is the process of combining two or more distinct entities into a new whole, an integrative process for joining two material entities into a unified body of one solid material or a multiple single elements joined together to form one material unit. The noun fusion comes from the Latin word fundere, meaning melt or combine, so fusion is the act of melting or combing things together. Fusion is about oneness, or fussing with

what appears to be separate from the self, in order to arrive at the union of opposites. The goal is to create common ground between different methodologies, to bring them together from its singular entity, to create new bridges, of a unified entity through creativity, what has been mostly single in the past (Purnell, 2004). Integration also means combining different functions or different techniques so that each of the functions or techniques, forming a subset work together or form a composite entity. It also refers to bringing different activities by more than one product to produce a unifying smooth working activity to arrive at a unique but different manufactured product culminated from two separate activities. This indicates that integration goes beyond just combination of parts or techniques, but a combination that makes the result be seen not as a group but a whole.

The concept of Fusion or integration in the context of this study proposes a new approach for developing a different novel *kente* with varied aesthetic appeal when woven. This turns to generate a visual simulated fabric based on the dyeing characteristics and properties of the weft and warp yarns and the weaving techniques used for *kente*. As Burnaford, Aprill, and Weiss, (2001), puts it, integration is about engaging a rich array of skills and learning strategies so that the understandings of each content area is enriched and illumined by the presence of other content areas. The approach relies on the choice of yarn colouration and the type of fabric design weave used. The idea is to breathe new life into weaving by allowing weavers the opportunity to creatively explore concepts and use their strengths to express their learning and knowledge in a variety of ways to create interdisciplinary methodologies in textiles (Burnaford, Aprill, and Weiss, 2001). As stated by McDonald and Fisher, (2002), a lack of utilization of different methodologies deprives weavers of cultural development and their deep connections about the real world. This project therefore, is to develop a

sense of creativity and emphasize the importance integration, as well as the benefits that integration provides to both the weaver and the customer.

2.8 Yarn, Decorative Techniques

Numerous decoration techniques are known in *Kente* weaving. *Kente*, known for its rich colours and designs, numerous decoration techniques have been used to enhance *Kente* weaving. Basic fabric decoration is dyeing techniques, embroidery and other stitchery like appliqué or quilting and by attaching leather, beads, metal, lace, ribbon and other decoration techniques. All these techniques have been applied in *Kente* weaving during and after the production process. However, in this study, the researcher executed tie-dyeing of bundles of weft and warp sheet to produce the *Kente* with unpredictable colour motifs.

CHAPTER THREE

METHODOLOGY

3.1 Overview

This chapter presents the research methods employed in addressing the set research objectives of the study. The chapter emphases on the following; the research design, population and sampling, data collection instruments, data collection procedure, data analysis plan and the processes involved in executing the project work.

3.2 Research Design

The research design is, however, the inclusive plan that links the theoretical research problems to the related empirical research (Van Wyk, 2012). Usually, two major research designs are available; they are the quantitative and qualitative methods. Research design according to Cohen et al (2007) is administered by the appropriateness of the purpose of the research that informs the methodology to be adopted. A number of factors necessitate the choice of this design, the variables or population and the social - cultural phenomena being studied as the main characteristics because of its systematic approach in unravelling certain truths regarding the envisaged project.

Mertens, (2014), opines that qualitative research emphasizes the holistic description of whatever is being observed rather than comparing the effects of a particular treatment. The researcher observed how *Ikat* cloth is done through pictures and videos on YouTube, practiced the idea gained in the weaving studio of the department of Integrated Rural Art to arrive at the best way the envisaged cloth can be achieved. A qualitative research according to Gill, Stewart, Treasure, and Chadwick, (2008), is a research that explores attitudes, behaviour and experiences through such methods as interviews or focus groups. As this research, attempts to publish an in-depth opinion

from participants, the researcher therefore describing the tie-dyeing and the weaving processes involved. Qualitative research is designed to enable researchers know the social etiquette of people and their culture in which they live. With the theory explained above, this research employed the used in qualitative research design due to the nature of the study.

3.3 Experimental Research Design

Experimental approach is characterized by much greater control over the research environment and in this case, some variables are manipulated to observe their effect on other variables. Reeves, (2000) explained that experimentation is the most scientifically sophisticated research methods. It is defined as an observation under controlled conditions. Experimentation is the description and the analysis of what happens when the variables are manipulated. This is to test hypotheses and to discover new relationships. The outcome after careful manipulation of the variables is what is most useful to the researcher. Experiments consist of three good stages these are the careful and systematic control, modification of the conditions determining observation and interpretation of the changes that occur in the event itself.

In this study, various dyeing methods were experimented with rayon yarns and different types of weaves were experimented with the dyed yarns. Hanked yarns were patchy dyed with various colours and cut into specific length and used as weft picks to weave *Kente* motifs. Various dyeing methods were experimented with various tones of dyed coloured yarns and used for various plain weaves and weft face weave to cover the warp sheets like *Edwin-si-Edwin-so*, to give the *Kente* a new outlook.

3.4 Descriptive Research Design

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

The descriptive research design was embraced to describe the systematic process of the production of patchy dyeing of yarns, to weave *Kente* strips. 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

Population in research refers to the aggregate or the totality of objects or individuals and the inferences made in a sampling study (Haque, 2010). A population is the group to which the result of the study is intended to apply Leedy, and Ormrod, (2005) emphasized that it is of great importance to find the right respondents to get the right information for the attainment of research objectives. The accessible population was selected from the weaving centres in the following towns namely; *Adawomase, Bonwire, Bepoase, Ntonso, Onno* and *Tewobabi* all in the Ashanti region of Ghana. These centres were selected due to the nature of work they produce and their methods of production. It was also observed that the works at these centres still adapt the traditional way of dyeing and weaving as the dyeing of some colours are practiced by some weavers when there is a shortage in some specific colours.

3.6 Sampling

Sampling is the process of selecting a representative unit from a population. Similarly, Cohen, Manion, and Morrison, (2013) also explained that in sampling, the researcher endeavours 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. In getting the right information, the sample design employed for this study was purposive sampling methods. The interviewees were people well versed in the area of the required information. The purposive sampling technique was used to select a sample from the accessibility population, which is made up of *kente* weavers in the various weaving centres located in these, *Adawomase, Bonwire, Bepoase, Ntonso, Onno* and *Tewobabi.* The purpose of selecting these areas were based on the accessibility to the towns, the several *kente* weaves produced and these are towns noted for *kente* weaving.

The table 3.1 below explains the target population, the accessible population, the towns and the sampling methods used.

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

Towns	**Sample Methods**	**Sample**	
		Targeted	*Accessible*
Adawomase	Purposive Sampling	25 People	12 People
Bonwire	Purposive Sampling	30 People	17 People
Bepoase	Purposive Sampling	5 People	4 People
Ntonso	Purposive Sampling	12 People	6 People
Onno	Purposive Sampling	10 People	7 People
Tewobabi	Purposive Sampling	8 People	4 People
Totals		**100 People**	**50 People**

3.7 Sources of Data

In order to make this research scientific proven and a reality, numerous of secondary data was collected from various publications and journals obtained from KNUST libraries Kumasi, Ashanti library Kumasi, and the internet. Experts in *Kente* weaving were contacted from the various weaving centres in the Ashanti Region.

3.8 Data Collection Instrument

Ary, et al, (2013) 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 astute conclusions upon which an insightful proposed alternate strategy could be based on to improve upon the quality of *Kente* weaving in Ghana; observation and interview were employed.

The multiple methods for data collection is known as triangulation (Cohen, et al, 2000). The use of triangulation ensures validity, credibility and richness of data from information gathered as this information can be crosschecked or verified from the different methods used.

3.9 Observation

This process implies information gathering in by way of 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, *Ikat* weft and warp yarn dyeing techniques and the tools, equipment, materials and techniques used.

3.10 Interviews

According to McMillan, and Schumacher, (1993), an interview consists of a direct verbal interaction between the interviewer and the interviewee. In order to get an accurate data and transcribe them, semi structure form of the interview was used for this study. Interview conducted was on one-on-one basis and carried out whiles observing the participants. Data were recorded empirically and supported by field photographs. The researcher, interaction with weavers in their local language which they were conversant with and can express themselves with ease which was later transcribed into English. Such flexibility in qualitative interviewing provided the respondents with the opportunity to converse with the researcher rather than to get into the mode of answering queries (Mason, 2010). The respondents were weavers which include apprentices and chief weavers.

3.11 Data Collection Procedure

The interviews were conducted on one-to-one basis. The researcher asked questions whilst the respondents provided answers. Interviews conducted were recorded on audiotape and later transcribed. Copies of the transcript in English were later sent to the interviewees for them to ascertain whether the information gathered was exactly what they gave out.

3.12 Data Analysis Plan

Field notes were transcribed and assembled in narrative form of data and pictures that describe the various processes that culminate in the final woven product in the study setting were analyzed. These were analyzed and interpreted to give an idea of the situation in the selected field of study. The project was designed to collect primarily qualitative data; data analysis followed a similar pattern with qualitative techniques being used on qualitative data. With this in mind some categorization of data was made and this categorization was types of dyes, techniques of tying, dyeing, pouring of dye solution onto yarns and type of yarns used in dyeing, and the outcome of the woven products in the field of study. Information received from people in the various fabric decoration techniques was also compared. These comparisons helped in the appreciation of the differences and similarities in the fabrics produced in the region under study. Details of these have been provided in Chapter Four.

3.13 Identification of *Ikat* Weave

The researcher chose to investigate more about *Ikat* weaving to enable him to know more about the uniqueness of *Ikat* cloth, their patchy dyeing techniques and looked at how well he can incorporate that skill into *Kente* weaving as decoration process. This was done by reviewing theories of *Ikat*, observing from pictures and videos about tutorials of how *Ikat* weaving is achieved and more about its characteristics.

3.13.1 Method of Yarn Decoration

Decoration of yarns prior to weaving, the warp yarns were arranged or spread on a table, then some portions are tied to resist the dyes before dyes were applied in portions all in accordance to the plan of the designer and the design intended to produce. The

wax resists method was also used. Below is a picture-showing warp being tied to create designs in Plate 3.1, and Plate 3.2, in Plate 3.3 is the warp yarn spread on table and colours applied. Plate 3.4 warp yarns being waxed to maintain colours and designs at portions. The same is done to the weft when double *Ikat* weaving is to be achieved.

Plate 3.1: Warp yarns being tied
(Source: http://www.draperystreet.com)

Plate 3.2: Shows how tying is done for *ikat* weaving
(Source: http://lillstreet.com/blog/textiles/*Ikat*-dying)

Plate 3.3: Warp yarns being coloured with dyes
(Source: https://www.youtube.com/watch?v=vfa7srYWo4s)

Yarns can be dyed with different colours by submerging. It can be partially dyed with some colour then resisted and some portions either tying or waxed as a resist and then dyed again if different colours are expected. Plate 3.4 is a picture showing partially dyed and wax resist have been applied to be dyed again.

Plate 3.4: Warp yarns being waxed
(Source: http://www.draperystreet.com)

Plate 3.5: Intricate a finial woven designed fabric from the tied warp
(Sources: http://lillstreet.com/blog/textiles/*Ikat*-dying)

It was also established that the warp yarns are either spread on a table or hanged on a wooden frame after warping and bundles of yarns are tied after to resist some portions from dye absorption and penetration. This helps bring out the uniqueness desired in the colouration subject to how tight the yarns are tied, to prevent dyes from running into some part of the tied portions. Plate 3.5 shows a nice woven effect after the warp and weft sheets were dyed. Screens were also used to print on a yarn sheet with ink or dye before the weaving for the actual design to emerge. Screen-printing is one of the process of colouration of yarns in *Ikat* yarn decoration prior to weaving. This is done

when precise designs or patterns are expected. Plate 3.6.is a picture of a screen print on a sheet of warp yarns.

Plate 3.6: Screen print on a warp yarn sheet
(Source: https://backstrapweaving.wordpress.com/2014/08/07)

The use of clay or wax-resist is often used to stamp onto the yarn and then immersed and re-immersed in the dye solution. Rice paste was also used as a resist. Sometimes *tjanting* is used to draw images onto the yarns with ink instead of a brush. Plate 3.7 shows the application of ink on a spread warp yarn.

Plate 3.7: Ink application on warp yarns
(Source: https://backstrapweaving.wordpress.com/2014/08/07)

All the above techniques shown were either resisted or tie-dyed prior to dyeing by immersion or by table dyeing according to the secondary source data received on *Ikat* yarn colouration. Based on these findings, the tie-dye, dyeing by immersion and table top dyeing techniques was selected for use in the study. This limitation was because *kente* weaving was already colourful and therefore desired to tone down the brightness of the cloth to be woven to give it a pastel effect after completion.

3.14 Production Procedures used for the *Ikat – Kente* Cloth

Materials, Tools and Equipment Employed in the Experiments

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

3.14.1 Yarns

Rayon yarns were used to carry out this experiment. The research deem it necessary to use this yarn because in the course of his search he found out that *Kente* weavers use this type of yarn the most in their field of work nowadays. Because of its fine quality texture and its sheen outlook. Moreover, numerous research has been carried on in both synthetic and plant base dye applications on cotton yarns or fabrics, both locally and industrially but no effort has been made to apply dyes on rayon yarns locally only industrial practice has been seen because of its low tensile strength.

The research used white rayon yarns manipulated it by tying and dyed it to achieve the patchy effect. The following dye recipe was used; vat dyes, sodium hydrosulphite, sodium hydroxide, alum and water. The following apparatus too were also used to help mix and apply the following recipes.

3.14.2 Vat Dyes

Vat dyes were the colorants used to colour the yarns as planned. This was used because the dyes are common in the market and easy to apply to yarns. With the right amount and composition of the sodium hydroxide and sodium hydrosulphide application to the right quantity of fibres or fabric, its affinity and durability is excellent.

3.14.3 Sodium Hydrosulphite

Is a composite chemical agent added to vat dye stuff to enable dyes fix to cellulosic materials. This was added as a fixative in the mixing of dyes to enable the dyes fix well on the material.

3.14.4 Sodium Hydroxide

This sodium chemical helps open up the pores of the fibres to achieve a good dye affinity when dyeing. It is sometimes soaked with the fibres before dyes application, but care must be taken not to weaken the fibres. The quantity of dye per yarns was determined after a series of test prior to the actual dyeing of the yarns. If more than necessary of this chemical is used, its weaken the fibres. With these controversies on this, it made the researcher tried the use of alum.

3.14.5 Alum

This help opens pores of the fabric or fibres in a mild way, even if more than necessary is taken, it doesn't weaken the yarns as to that of caustic soda.

When it came to the weaving process the following equipment were used. Loom, Bobbin winders, Bobbins, Skiener, Spool rack, Warping mill, Shuttles.

3.14.6 Loom

The loom is a machine used for weaving. Two kinds of loom were used to weave in this research, namely the *Kofi Nsadua* and the *Boku* loom. These looms were used because this looms are available and are mainly found in the research areas. *Kofi Nsadua* is the traditional loom commonly found in the Ghanaian cottage weaving industries. The *Boku* Loom has an improved version of the main traditional loom *(Kofi Nsadua)* which can be found in the department of Integrated Rural Art and Industry.

3.14.7 Bobbin Winder

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

3.14.8 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.

3.14.9 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.

3.14.10 Spool Rack

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

3.14.11 Warping Mill

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

3.14.12 Shuttle

This was used to carry the weft through the shed for interlacing of weft in the warp during weaving. Yarn colouring, a decoration technique was the main objective of this study to bring novelty in *Kente* weaving. The technique of tying and dyeing was used to colour yarns in patchy form to bring different colouration techniques in *Kente* weaving industry. In order to achieve this objective, equipment like bows, spoons, hand gloves, pictures of all these are shown in the working process of this research.

3.15 Designed Motif for the *Kente*

As traditional *Kente* weaving keeps on improving in terms of its designs, the researcher also tried to come out with any design concept, which can be adopted, into traditional *Kente* weaving below are the design concept in the following figures.

Corel draw software was used to design this to demonstrate the researcher's ability of the use of the software and to demonstrate to the traditional weavers the essence of education that enable one to arrange and show a proposed design before weaving the actual cloth.

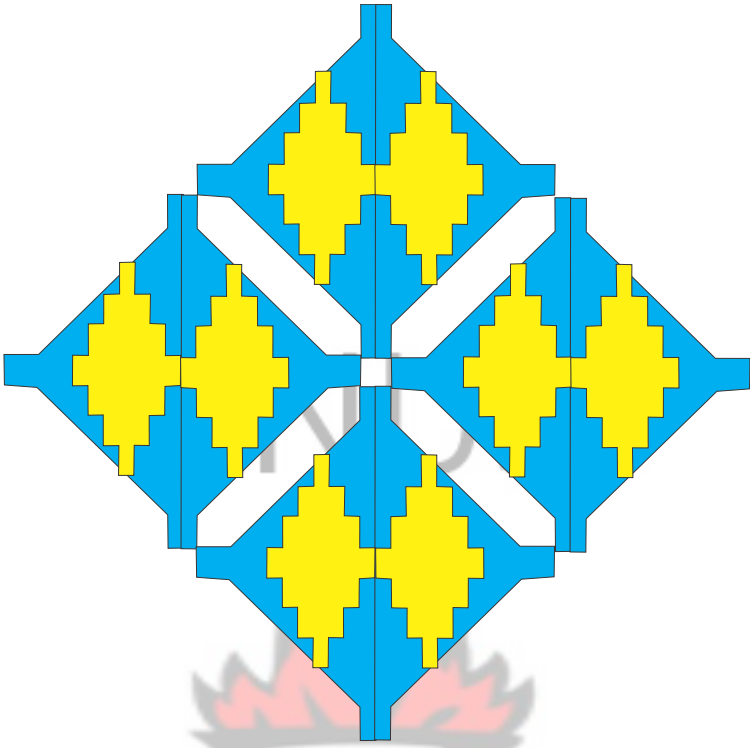

Figure 3.1: Design concept one
(Source: Researchers Fieldwork)

Figure 3.2: Design concept two
(Source: Researchers Fieldwork)

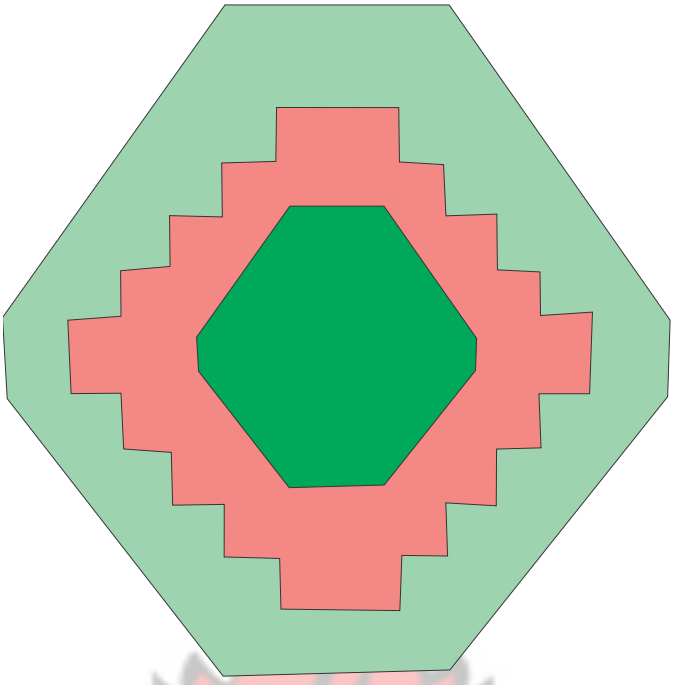

Figure 3.3: Design concept three
(Source: Researchers Fieldwork)

Figure 3.4: Design concept four
(Source: Researchers Fieldwork)

Figure 3.5: Design concept five
(Source: Researchers Fieldwork)

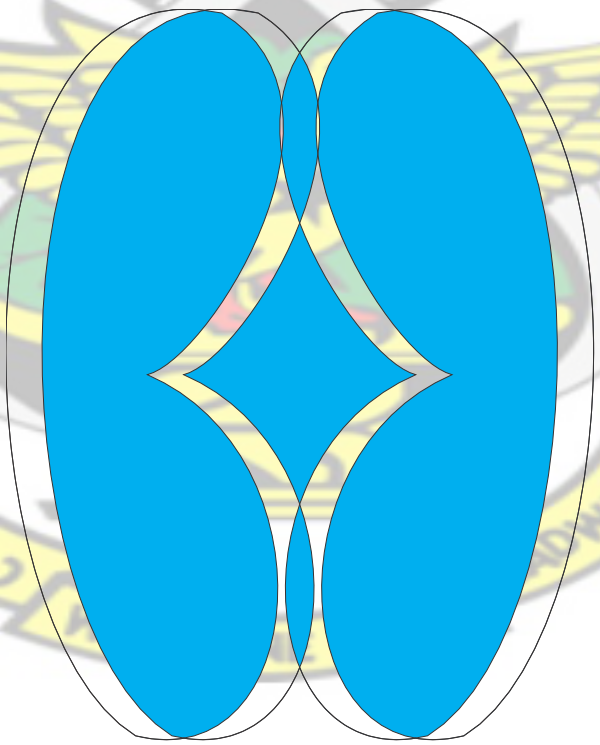

Figure 3.6: Design concept six
(Source: Researchers Fieldwork)

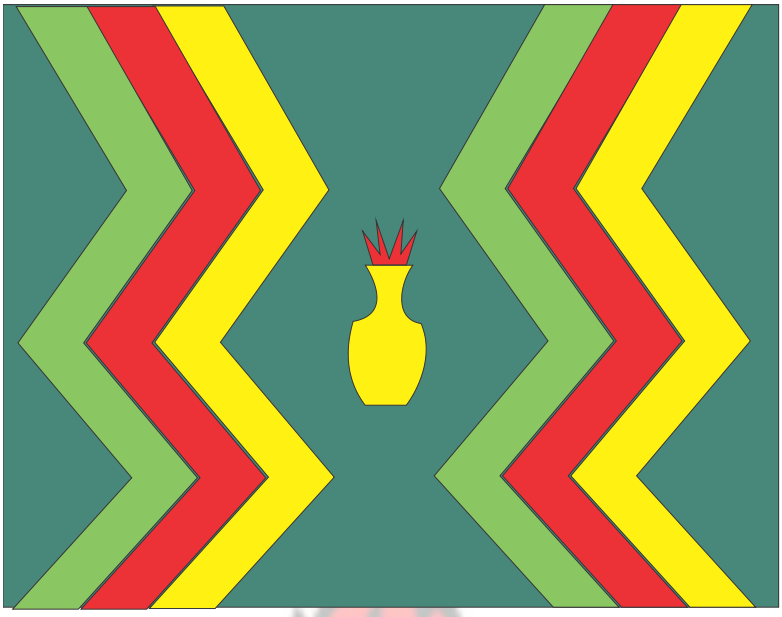

Figure 3.7: Design concept seven
(Source: Researchers Fieldwork)

3.16 Activities to Achieve Objective Two

In order to achieve the patchy effect of yarn colouring in *Kente* weaving as stated in objective two, warp and weft were tied in various formations before dyeing to enable the researcher achieve the new yarn decoration techniques in *Kente* weaving. The knowledge partially gained after observing the pictures and videos of *Ikat* were translated into weaving. Positivism as epistemology reveals that we acquire our knowledge from our sensory experience of the world and our interaction with it (empiricism).

3.16.1 Yarn Preparation

The rayon yarns as specified, to be used in this research, was easily acquired from the market. They come in cones as shown in Plate 3.8. In order to dye the yarns, yarns were released from cones with the warping process. Warping was done with the yarns and crosses were created during warping to help maintain the right parallel formation of the

warp. Warp yarns were tied in various lengths and formation in readiness to resist the dyes before it was removed from the warping mill for dyeing.

Below are pictures of how the yarn preparations were carried out.

Plate 3.8: Cones of yarns
(Source: Researchers Fieldwork)

3.16.2 Tying and Dyeing

The cone yarns from the market goes through a warping process (Plate 3.9) before tying at regular or irregular intervals with a raffia on the warping mill (Plate 3.10).

Plate 3.9: Yarns on the warping mill
(Source: Researchers Fieldwork)

Plate 3.10: Yarns tied at intervals on the warping mill
(Source: Researchers Fieldwork)

Plate 3.11: Tied yarns from the warping mill.
(Source: Researchers' Fieldwork)

Yarns were tied in different formations and in the folds after warping to see how intricate and nice it will be. Below is Plate 3.12 showing series of tying of yarns before dyeing.

Plate 3.12: A chained yarns being tied
(Source: Researchers' Fieldwork)

Plate 3.13: Chained tied yarns being folded and tied again
(Source Researchers' Fieldwork)

Plate 3.14: Folded, tied yarns
(Source Researchers' Fieldwork)

After yarns were tied and folded in different forms, they were immersed in a water bath mixed with alum for 15 hours. This helps the opened up the pores of the fibres and removed any sizing, materials on the yarns for easy dye absorption. The same process can achieve when the yarns are boiled for about one and half hours. The boiling time, the quantity of alum and the litres of water needed for mixing were checked to avoid weakening the fibres of the yarns since boiling for too long a time weakens the fibres of the yarn. Below is a picture of yarn soaked in alum solution (Plate 3.15)

Plate 3.15: Soaked yarn in Alum
(Source: Researchers' Fieldwork)

The yarns soaked in alum for an hour, is then removed and put into an empty dye bath ready for dyeing. The right quantity and quality recipes of vat dyes were mixed with the right amount of caustic soda and sodium hydrosulphite bearing in mind the volume of yarns to be dyed. After stirring and making sure all recipes have been added in the right quantity, the dyes were poured onto a dye bath containing the wet yarn, which has been removed from the alum. With rubber gloves on hand, the yarns are turned and pressed in the dye bath solution for twenty (20) minutes. This mode of dyeing by immersion is applicable to tie yarns that needs to be dyed with one colour. This method of dyeing by immersion became the usual practice of the study due to its interesting patchy patterns achieved. To obtain different colours along the stretch of the tied warp, different dyes were mixed in different bowls and portions of the tied yarns dipped in these separate dye baths. This was to obtain a diverse colour patchy pattern on different portions of the tied yarns, (Plate.3.16).

Plate 3.16: Dyeing of the yarns in three dye bath
(Source: Researchers' Fieldwork)

Tied yarns dyed by immersion were later oxidized, washed and the resist materials removed, dried and portions of the dyed yarns re-dyed by immersion in a different colour dye solution to generate interesting patterns. (Plate 3.17).

Plate 3.17: Dyeing of the yarns in parts
(Source: Researchers' Fieldwork)

Yarns folded lengthwise, are sometimes divided into two halves, one-half immersed in a dye solution and the other half in water to allow osmosis to take place later in the dyeing process. Here, dyes run from one part of the yarns within the dye bath by diffusion to the other part of the yarns in the water shown above (Plate 3.17). This enables the dye to run through the yarn gradually at its own pace, given an interesting pattern equally at both ends of the tied yarns.

Plate 3.18: Dying of the yarns in parts
(Source: Researchers' Fieldwork)

After going through all this process yarns were removed from the dye bath and left under shade for oxidization. These yarns were not dried under direct sun. The dyed yarns after removal from the dye bath, was hanged under shade for the dye water to be drained. The real expected colour becomes visible with the dyed yarns when oxidation takes place as the yarns are left for a day to dry. However, where there is no shade to dry the yarns, oxidation is preferably done in the evening to avoid the sun rays. If dyed yarns are exposed to direct sun it changes the expected colour making the dyer deviate from whatever colours he or she wants to achieve. Below in Plate 3.19 is a picture of dyed yarns left for oxidation under shade.

Plate 3.19: Yarns exposed for oxidization
(Source: Researchers' Fieldwork)

After yarns have been well oxidized and dried to reveal the colours expected yarns were then put in clean water and rinsed to remove excess dyes.

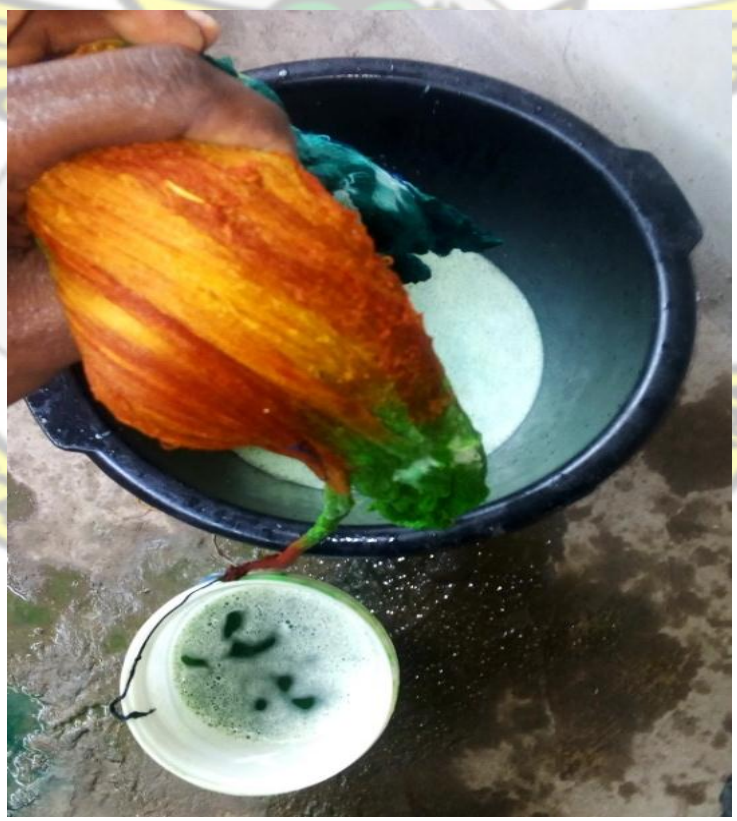

Plate 3.20: Washing of yarns in soapy water
(Source: Researchers' Fieldwork)

The ‘soaping’ process to test the colour of yarn fixation. The dyed warp yarn was treated in hot soap solution or a mild detergent solution for 10 minutes. After the soaping treatment, the dyed warp yarn was rinsed again thoroughly and finally dried in a cool, airy place (Asmah et al, 2015). A little hand jerking stretchy process was exerted on the dyed warp yarn to loosen the yarn for further processes. After the yarns were successfully dried, the dyed warp yarns were arranged and mounted on the traditional kente loom ready for weaving (Plate 3.20 and Plate 3.21).

Plate 3.21: Drying of the washed yarns
(Source: Researchers’ Fieldwork)

Plate 3.22: Patchy warp stretched on a traditional loom
(Source: Researchers' Fieldwork)

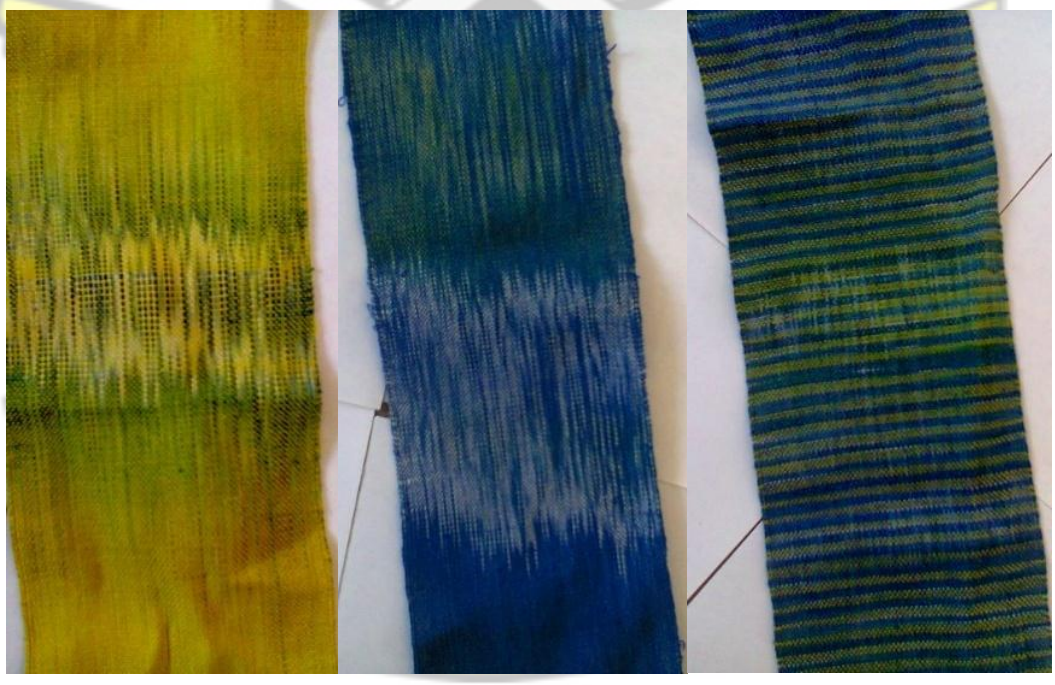

Plate 3.23: Plain weave with patchy yarn effects
(Source: Researchers' Fieldwork)

Plate 3.24: A Patchy warp on a loom
(Source: Researchers' Fieldwork)

Plate 3.25: Design weave known as Apremmu
(Sources: Researchers Fieldwork)

Many older designs were woven as well as the introduction of new designs. The patchy dyeing effect gained through dyeing when woven also revealed an interesting and unique pattern in the weaving. Even with simple plain weave, it exhibited a wonderful design pattern that can never be achieved when using the coloured yarns that comes from the industry. Examples of these are shown above in Plate 3.23, Plate 3.24, Plate 3.25, Plate 3.26 respectively. Below in the Plates 3.26 shows pictures of new design woven with patchy dyed yarn as weft.

Plate 3.26: New design woven with patchy yarn effects
(Source: Researchers' Fieldwork)

Plate 3.27: Weaving of the adapted Nkyinkim design
(Source: Researchers fieldwork)

CHAPTER FOUR

PRESENTATION AND DISCUSSIONS OF RESULTS AND FINDINGS

4.1 Overview

This chapter aims at explaining the insightful gains and exploration of patchy yarn dyeing, how it was used in weaving, its outcome and its introduction into Kente weaving 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 discussions.

4.2 Discussion of Results for Research Question One

The investigation into *Ikat* decoration method of patchy yarn dyeing and its introduction into the Ghanaian Kente weaving industry, has announced an alternate yet creative *kente* cloth that promote and augment *kente*-weaving designs. In literature, less is known about *Ikat* weaving techniques in Ghana. Only the northern part of Ghana has introduced the effect of patchy dyeing in its *fugu* weaving tradition. The set objective of research question one was to probe into *Ikat* patchy yarns dyeing, experiment it on yarns and introduce such colouration (patchy dyeing effect) into traditional *Kente* weaving. The research exhibited numerous tying and dyeing techniques after warping of warp and weft yarns via bundled tied, and various print colourations create intricate designs prior to weaving in the *Ikat* weaving tradition (Plate 3.1 to Plate 3.7).

Sheets of warped yarns were either spread on a table or hanged on a wooden frame, bundled and tied to resist some portions from absorption and penetration of dyes during dyeing. This unique colouration depended on the tightness of the yarns tied, or the type of resisting and dye application to result in a patchy dyed effect after weaving (Plate 3.1 to Plate 3.7). Colouring was also done on portions of the warp sheets with ink via a brush on designated areas. For precise designs or patterns, a screen printing method was used as one of the colouration process on sheets of yarns (with ink or dye) prior to weaving (Plate 3.7).

4.3 Other Methods of Yarn Decoration

The use of clay or rice paste with wooden stamp and wax-resist with *tjanting* as a resist method to affect an image onto the sheets of yarns before dyeing by immersion and re-immersion were other colouration techniques adopted. The application of ink or dye via the brush before a wax resist on a warp sheet prior to dyeing by immersion assumed a different colouration effect peculiar to *Ikat* yarn decoration tradition. Multi-resisting and dyeing techniques (including tying, waxing, clay stamping, painting with brush and dyeing by immersion) were also applied to give different colouration effect on the woven *Ikat* fabric.

4.4 Discussions of Results for Objective two

Based on the findings in the literature to address objective one, the following techniques of dyeing by dipping, table top dyeing and dyeing by immersion on bundled tied-warp sheets were adopted and applied in this study. Since the cone coloured yarns obtained from the market were void of patchy colour effect, yarns were unwound into hanks before dyeing to achieve the effects required, but in this project, the plain white

yarn was used purposely to obtain clear varied colours at the end of the dyeing operation of the Kente experiments. Plate 4.1, shows *kente* motifs referred to as *Apremmo* woven out of the regular yarn colours. Plate 4.2 also shows the same motifs woven out of one coloured patchy dyed yarn. The effect of these two *kente* works, though, is colourful, Plate 4.1 utilized multiply coloured yarns, whiles Plate 4.2 utilized only two patchy dyed coloured yarns to effect almost the same multiplicity of visual effect. Apart from the white coloured margins that are common to all at the base and the upper part of the motif, the background of the *kente* in Plate 4.1 is blue in colour, but the patchy dyed background (Plate 4.2) cannot be easily identified, making its visual effect more pronounced though the yarn colour used was patchy brown.

Plate 4.1: Showing normal *kente* design known as *Apremmo*
(Source: Researchers' Fieldwork)

Plate 4.2: Showing Apremmo design woven with patchy dyed yarns
(Source: Researchers' Fieldwork)

Plate 4.2 shows a fancy design effect gained from the patchy weft used to create the same motif '*Apremmo*', in Plate 4.1. This shows a clear difference between the two as Plate 4.1 indicate the effect derived from using the normal plain and distinct coloured yarns of blue-black, yellow, red and light green obtained from the market place whilst the effect of the patchy dyed yarns used in Plate 4.2 shows the same design but in a shady and patchy visual disposition. The dyeing of the weft and warp yarns guaranteed a durability of fastness to washing better than the yarns bought at the market place, which sometimes bleed when it encounters sweat from the weaver's body. Thus, the tying and dyeing methods of colouration prove to be effectively reliable and durably advantageous in its adaptation and application.

Though there are varied forms of resisting as the literature indicates, tying as a form of resist is not new to the weaving community since there are clusters of cloth dyeing communities within the same catchment area. The potency and use of vat dyes among

batik and tie-dye producers are a testimony of its availability and mode of usage in the community and therefore not new to the weaving communities in Ghana. There are hanks, cones normally used by the weaving communities, but their preferred choice in most communities is the cones due to its lengthy easy and portable nature, and therefore the study adopted the use of rayon cones in all the experiments. The cone yarns bought from the market goes through a warping process before the tying of the warp at regular or irregular intervals with a raffia on the warping mill (Plate 4.3). This adaptation made it easier and reduced the time spent, if tying were done after the warp had been laid as a sheet on the loom instead of the warping mill.

Plate 4.3: Tying of warp on the warping mill
(Source: Researchers' Fieldwork)

However, others were chained and removed from the warping mill before the yarn tying at either regular or irregular intervals. After irregular tying of warp on the warping mill, yarns were removed by the chaining method, folded, and tied again. In each case, tying was done in such a way as to allow free absorption of dye in each dyeing process.

Though there are varied ways of print colouration as cite in the literature, the choice of dyeing by immersion and dipping was due to its resultant effects achieved at the end of the series of experiment conducted at the onset of the project. Additionally, it does not require any auxiliary tool like a silkscreen or table to transfer the dye onto the yarns apart from the plastic bowl, spoons, chemicals and water.

After tying technique, dyeing by immersion technique was employed after the tied yarn in each case goes through wetting to aid dye absorption. With the dipping technique, dye solutions are prepared using the right quantity of dye recipe consisting of a mixture of two tablespoonful of dye, two tablespoonful of sodium hydroxide and one tablespoonful of sodium hydrosulphite. The dye solution was allowed to attain the leuco-compound state before they are transferred into dyebaths for dyeing.

Half of the tied wet warp was dipped into one dye colour and the other half dipped into another dye colour to attain two-colour dye on the same tied warp. The same tied warp can also be treated in three or more colour dyebaths at the same time depending on the dyeing procedure. The resultant effect derived was the unique and nice colouration where two or more colour dyes were diffused collectively into the tied warp. Dyed colours are also allowed to diffuse or merge into each other to give interesting colouration at each interval of the tied warp yarns. Plate 4.4 demonstrate how dye colours uncontrollably diffuse into each other at the periphery of each colour through osmosis to achieve interesting and unpredictable results.

Plate 4.4: Shows a woven, dyed fabric with complex diffused colour formation
(Source: Researchers' Fieldwork)

On the other hand, a précised colour effect can be achieved with the nature of tying if it is aimed at a specific design pattern. Yielding fruitful results comes out of years of experience in playing around with tying and dyeing. Though it's a new technique introduced into *Kente* weaving, its method of production is not too tedious to deter traditional weavers from adopting it since achieving a good result is not based on precision but a choice of comfortability in the tying and dyeing process.

However, it was observed during dyeing by immersion that when the dyebath solution are of high chemical content the yarn turn to lose its tensile strength when kept in the dyebath for a longer time due to high concentration of sodium hydroxide and sodium hydrosulphite. It was also observed that the alum solution used for the yarn wetting process opens up the pores of the yarns for easy dye absorption but a high quantity of alum weakens the yarns. To avoid yarns breakages, yarns must be treated according to specifications, to avoid such troubles during weaving. The use of Alum can be eliminated if one is certain that the chemicals used in mixing dyes are of good quality.

As already reiterated, effective *kente* design weaves starts from the conception of the design weave as well as its yarn colouration. Therefore, the planning of its design concept, mode of dyeing, the use of design motifs, its arrangement and weave type are paramount. The normal tradition *Kent*e weaving loom was engaged for the weaving of the patchy dyed yarns. The traditional way of heddling and reeding process and tie-up was used. The dyed yarns were mounted in the traditional loom and woven with both the traditional designs, researcher's new designs as well as the Adinkra symbols (Plate 4.1, Plate 4.2, Plate 4.5, and Plate 4.6). Out of the numerous traditional designs produced, simple patchy design weaves were also achieved. Traditional *Kente* weaving designs were used and adapted in creating new designs. The researcher tried the old traditional *Kente* designs with the patchy dyed yarns and incorporated new ones to produce stoles.

Plate 4.5: Weaving *Appremu* designs
(Source: Researchers' Fieldwork)

Plate 4.6: Weaving of *Fahia Kotwere Agyemang*
(Source: Researchers' Fieldwork)

Plate 4.7: Weaving with the Adinkra symbols
(Source: Researchers' Fieldwork)

Plate 4.8: Weaving of adapting designs
(Source: Researchers' Fieldwork)

Plate 4.9: Adapted designs woven with patchy dyed yarns
(Source: Researchers' Fieldwork)

Plate 4.10: Final work to solve objective two
(Source: Researchers' Fieldwork)

Both the *Ikat* weaving tradition and *Kente* weaving tradition have almost everything in common in terms of colour, weaving methodology and symbolic cultural philosophies depicted in their woven cloth. Plate 4.9 and Plate 4.10 are, but few of the final works produced in this project.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECCOMENDATIONS

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 *Kente* weavers who manage to combine the old and new values of *kente* production. Traditional *kente* and the modern *kente* weaves still co-exist alongside the exportable creative and innovative *kente* products, which indicate that the peculiarity of *Kente* and the unique character of traditional weaving still persist with modernity (Asmah et al, 2015). This, notwithstanding, there is a growing similarity between the traditional and the modern *kente* 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 *Ikat-Kente* with its unique traditional weaving characteristics and yarn patchy dyeing suggest a welcoming phase to the changing trends of the *kente* industry. Thus the pendulum of *kente* designs and new techniques, 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 culture which presupposes that introducing *Ikat-kente* to Ghanaian or West African communities, will go a long way to further promote the sustainability of the *kente* industry. The end product of this project is aimed at the exuberant youth and the modern fashion industry who are already familiar with dyeing. The basic tools and techniques of traditional *kente* weaving remains the same. The new introduction is the systematic process of

patchy dyeing, and the utilization for *Kente* strip weaving for 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 the *kente* industry.

5.2 Main Findings

This research has been successful, the researcher found out that the affinity of dyes were good, but the outcome of the yarn colouration was relatively good as compared to the already coloured yarns used in the industry. Patterns achieved were not definite. It was difficult to produce the same pattern if the same steps are followed thus making each work unique. In orderwards, two designs cannot be the same. Using the patchy dyed yarns to create designs like *Edwin-si-Edwin so* (weft face design), produces a unique design because of the patchy dyed yarn within the created design. With small effort and time, nice and intricate designs were produced due to the patchy dyed yarn effect. The realization was that most yarn dyers' do not know the use of vat dyes for dyeing yarns; suede dye is what is normally used for specific colours, which are in short supply from the market.

5.3 Conclusion

The cardinal principle of using patchy dyed yarns to weave *Kente* stoles have been successfully executed; examining the patchy dyed yarn weaves prove to be fast to light and washing when exposed to sunlight. 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 the patchy dyed yarns. It, however, retained its

cultural identity and managed to maintain its traditional *Kente* weaving techniques. The study, therefore, offers a new platform for dyers, weavers, and experts in the *kente* industry to manipulate and enhance their skill of dyeing and weaving. The uniqueness of this art, based on the patchy colouration effect introduced into *Kente* 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 above research achievement, the following recommendation has been made for implementation by both the yarn dyers and the producers of *kente* in Ghana.

1. The creative way of yarn dyeing and *kente* weaving must be encouraged in all educational institutions to help empower and enable the spread and preservation of this knowledge for posterity.
2. Weavers and dyers are to collaborate with one another in our local industries to help broaden the idea of dyeing and weaving to boost cotton production.
3. The researcher recommends that investigation be made with other dyes used in the textile industries to achieve other interesting results.
4. The Ministry of Tourism in collaboration with the Ministry of Trade and Industry, and the Department of Integrated Rural Art and Industry organize workshops and seminars to educate weavers and dyers in our locality to help improve and boost the *Kente* weaving industry as well as the tourism industry.
5. It is recommended that a wellness resource centre be established to preserve, and improve the Kente weaving industry in Ghana as the world keep on changing.

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APPENDICES

Appendix 1

Interview guide for Kente weavers

The objective was to know the changing trend of Kente weaving and how new techniques can be fused into it.

1. How did you become a weaver?
2. How many years have you woven as a Kente weaver?
3. How many trend changes (techniques and skills) have you seen in Kente?
4. Have you dyed your yarns prior to weaving before?
5. How do you foresee the outcome if our yarns are patchy dyed before woven?
6. Will the patchy dyed yarns bring some uniqueness into Kente weaving?
7. Will the dyeing of yarns deviate the concept of Kente from its philosophical meanings and symbolism?

Appendix 1 b

Interview guide for dyers

The objective was to know how yarn dyers operate and chemical use

1. How did you start your dyeing occupation?
2. How long have you dyed yarns?
3. What do you normally dye yarns and how different is it from the ones bought from the market?
4. What chemicals do you use for the dyeing?
5. Do the yarns have an affinity for the dyes?
6. Do you know of Vat dyes?
7. Have you dyed yarns in a patchy form for weaving before?

Appendix 2

Observational guide

Objective: systematically follow the activities of yarn dyers and new approaches in Kente weaving

1. Observe the environmental setup and settings.
2. Observe the attitude of work and conducts.
3. Observe Operational procedures.
4. Observe tools, materials, usage and impact.
5. Observe finish products.