FEMALE LECTURERS' ACCEPTABILITY OF IMPROVED AKWETE FABRIC FOR SPECIAL OCCASION IN IMO STATE'S TERTIARY INSTITUTIONS, NIGERIA.

BY

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DECLARATION

I declare that this thesis was written by me in the department of Vocational and Technical Education, Faculty of Education, Ahmadu Bello University, Zaria under the supervision of Prof. T.O. Ojo and Dr. S.L. Ajayi.

_____ _____

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CERTIFICATION

The thesis titled "Female Lecturers' Acceptability of Improved Akwete Fabric for Special Occasion In Imo State tertiary institutions Nigeria" meets the regulation for the award of Masters' Degree in Home Economics Education (M.Ed) of Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literacy presentation.

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DEDICATION

This research work is dedicated to my husband, Patrick C. Anucha, and my children.

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ABSTRACT

This study was carried out to determine the Female Lecturers acceptability of improved Akwete fabric for special occasion in Imo State tertiary institutions Nigeria. Four objectives were stated among which were to use fine industrial yarns to improve Akwete fabric to reduce the weight, coarseness, and improve the design. The research was also guided by four research questions and four null hypotheses. Experimental research design was used for the study. The population for the study were 2000 female lecturers and a sample of 200 respondents were randomly selected by multi-stage random sampling technique. Score card was used to collect data. Descriptive statistics was used to answer research questions, while Analysis of Variance (ANOVA) and t-test were used to test the hypotheses and were all rejected at 0.05 level of significance. The findings revealed among others that there were 1,728 plies of yarns per one square centimeter of the conventional Akwete which escalated the weight and this brought about resistance to air flow, making the fabric uncomfortable to the wearer. The improvement on this fabric led to the acceptability by 180 out of 200 female lecturers with ground mean acceptability of 3.94 above cut-off point 2.50 indicating highly acceptable. In view of the findings, it was concluded that reduction in yarn count, using plain weave and rayon yarns dropped the weight of improved Akwete fabric and it was accepted. Based on the findings, it was recommended that yarn counts should be reduced to 280 plies per square centimeter and plain weave with rayon yarns should be used while weaving to reduce the weight, coarseness, and be acceptable.

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OPERATIONAL DEFINITION OF TERMS

These are technical terms that are unfamiliar to the reader that need to be explained or define, for easy understanding of the work. They are as follows:

Akwete fabric: The traditional Ibo woven fabric made of cotton in Ndoki town of Akwete

Akwete: A small town called Ndoki found in Ukwa-East local government area of Abia State.

Ariaria: This is the name of a popular textile market in Aba in Abia State, Nigeria

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Akwete woven fabric is the first Ibo traditional hand woven cloth in Ndoki town of Akwete in Ukwa East local government of Abia state in Nigeria. This quality Akwete cloth produced Iboland is highly priced for Ibo people's ceremonial dress known as "up and down", it is mainly used by fashion conscious women as wrapper for high society ceremonies and by men of taste for special outings. Otuka (2009) observed that these women usually tie the cloth as a wrap-round skirt (wrapper) with a blouse of light weighted machine made fabric, and the men use the fabric to sew traditional shirts popularly known as "jumper", "wokor" or "etibo" which they wear over trousers for special occasions. Akparanta (2009) and Otuka (2009) viewed this cloth as one of the finest local hand woven fabrics in the world, produced in Nigeria by the Akwete community, hence its name Akwete. According to them, the cloth is made of pure cotton yarn, with addition of contrasting colours of threads of heavier texture to achieve decorative patterns and effects. It is heavy and coarse to the skin which may account for its low popularity among literate women of Imo state. They further stated that this fabric is also used to produce other articles such as designer's shoes, handbags and ties, which among others which could have attracted literates but a lot were not convinced to appreciate or accept Akwete cloth, for frequent usage. There appears to be the need for its improvement, so as to be accepted for use by these persons for special occasions.

Improvement deals with redesigning and restructuring of an article to suit its contemporary users. Improvement is also meant to add value, to suit a particular state, condition or situation. For instance in business circle, any product or article that is not catching the interest of people is always improved on and when that is done, it makes way for higher demand.

Weber (1990) observed that improvement can come in the form of creativity expression and good tastes on clothes that one wears; and how one coordinates clothes and styles chosen. Improvement can also be in the form of adjusting the quality the design and method of construction of a fabric. Improved Akwete fabric therefore is the fabric that has been adjusted in quality, design and method of construction.

As with any well established culture, most nations have certain fabrics and fashions that reserved for ceremonies and other special events. Williams (2009) observed that in western cultures, black tuxedos are worn by men on most formal occasions but standard for women vary depending on the event. He further stated that Nigeria's definition of formality is based more on the ornamentation and intricacy of the outfit's design. He added that it all depends on the way the garment is presented. For instance simplest caftan can easily become a states woman's gown with some creative embroidery and the simplest head scarf can be folded and tied in dozens of ways during wide variety of everyday and special occasion. Also some traditional attire can be made into special designs and reserved for special outings for men and women of taste. Special occasion therefore is meant to be the unique outdoor moments that come once in a while.

Female lecturers are the literate ones among other women in the society. They are literate because they went to school especially higher institutions and learnt some

specialized course of studies therefore they have their own way of reasoning or view over certain issues. These literate women mingle with mini societies such as students in the campuses and larger societies outside campuses daily while carrying out their duties and because of that they need to be convinced properly on the aesthetic functions of this fabric in order to accept it, because they cannot go by out-dated fabric if they should command respect.

The purpose of this research is to improve on the structure and design of Akwete fabric and evaluate its acceptability among the female lecturers in tertiary institutions.

1.2 Statement of the Problem

Akwete fabric is associated with a lot of problems that make its acceptability difficult especially among contemporary educated women elites. The researcher observed that Akwete fabric is heavy, this may be because of the basket weave used in making it. This weave has double set of yarns which has about nine plies in a yarn, in both warp and weft and any material made in such a way is likely to be heavy. In addition to this, Otuka (2009) stated that the basic Akwete cloth is usually made of cotton threads which are not mercerized to reduce weight, and the addition of decorated patterns and effects with threads of heavier texture for contrasting colours, make, the fabric even heavier. Furthermore, the researcher conducted a cursory market survey in Ariaria market, Aba and Onitsha main market, the two most popular textile markets in eastern Nigeria, dealing on this fabric on assessing the physical property of Akwete, by handling and feeling the texture, it was discovered that this fabric is actually heavy. The weight of the cloth may have accounted for the low use of the cloth by elite for special occasions.

Akwete fabric is coarse and harsh to the skin. The researcher feels that since the fabric

is woven with basket weave which helps in its compactness, that it could not allow air flow into the body when worn, as a result, one feels hot and uncomfortable in it. Also from the researcher's interaction with some married women who wore it as uniform for a wedding ceremony, they reported they felt uncomfortable in the fabric because of its harshness to the skin, possibly due to its coarse texture and weight. Other wearers also complained of the outdated design made on the material, which were mainly of animals such as tortoise, birds, lizard and the likes. These are no longer appealing to them for fashion, so there is need for some innovations on the fabric especially on the patterns and designs made on the material.

The present research therefore aimed at reducing the weight of the fabric by reducing the yarn count and improving on the weave and design for female lecturers in order to determine their level of acceptability of this fabric for special occasion.

1.3 Objectives of the study

The main objective of the study was to determine the acceptability of improved Akwete fabric for special occasion for female lecturers in tertiary institutions in Imo State Nigeria.

The specific objectives were to:

1. use fine industrial yarns to produce improved Akwete fabric in a way to reduce weight.
2. use fine industrial yarns to produce improved Akwete fabric in a way to reduce the coarseness.
3. improve the design of Akwete fabric.
4. determine the acceptability of the improve fabric for special occasion among female lecturers in tertiary institutions in Imo state.

1.4 Research Question

1. What is the difference between the weight of improved and the conventional akwete fabric?
2. What is the difference between the coarseness of improved and conventional akwete fabric?
3. What is the difference between the design made on the improved and conventional Akwete fabric?
4. What is the extent of acceptability of the improved fabric for special occasion by female lecturers in tertiary institutions in Imo State.

1.5 Hypotheses

The following null hypotheses were formulated for the research work

H01: There is no significant difference between the weight of improved and conventional akwete fabric?

H02: There is no significant difference between the coarseness of improved and conventional akwte fabric?

H03: There is no significant difference between the design of improved akwete and conventional akwete fabric.

H04: There is no significant difference between the acceptability of the improved and conventional akwete fabric for special occasion by female lecturers in tertiary institution in Imo state.

1.6 Significance of the Study

The research findings will be of benefit to female lecturers, local weavers, cottage industries and entrepreneurs.

Local weavers will adopt the established standard of weaving from this research and continue to improve on it, using fine industrial yarns for production as their product can be made into diverse fashionable outfits that can be appreciated nationwide and internationally thereby promoting the culture of Ibo land and boosting the economy of the Akwete community.

The result of the research is going to be of advantage to all those who intend to open cottage industries that specialize only in weaving Akwete fabric, applying the improved new standard thereby being self reliant generating income for the success of the family.

The research will also be of benefit to the nation at large as these products will be exported internationally, thereby exposing Akwete community internationally and this will also lead to attracting foreign currency and tourism to Nigeria accrued to exposing the material outside Nigeria.

1.7 Basic Assumption

This research is based on the following assumptions:

1. That the weight and coarseness of the traditional Akwete cloth can be reduced by manipulating the yarns and changing the weave.
2. That after improving on the Akwete fabric, it can be used as special occasion outfit for female lecturers and they will accept it.
3. That the local weavers will accept the established standard of weaving the improved Akwete fabric thereby increasing their interest in the weaving profession, again.
4. That there will be high demand and patronage of the improved fabric since these lecturers had accepted it for special occasion.

1.8 Delimitation of the Study.

This study is delimited to female lecturers in five tertiary institutions in Imo state. This is because their response can be used as inference to the reaction of other women in Iboland. It is also delimited to two different products made from Akwete fabric, the first, the improved Akwete fabric and, the second the conventional Akwete fabric. Finally is delimited to Akwete town in Ukwa East Local Government Area of Abia State.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The related literatures were reviewed under the following sub-headings:

2.1 Conceptual framework

2.2 Fabric Construction

2.2.1 Use of Yarns

2.2.2 Weaving

2.2.3 Origin of Cloth Weaving in Iboland

2.3 Materials and tools

2.4 Design

2.4.1 Problems Associated with Akwete fabric

2.5 Empirical Studies

2.6 Summary of Related Literature

2.1 Conceptual frame work

Innovation of Akwete Fabric for Acceptability for Special Occasion

The study on Akwete fabric as a concept is new and unique and not much work has been done on it and the few empirical work, did not cover as far as conceptual framework. The purpose of this research is to construct an integrated conceptual framework (Appendix x) on Akwete fabric in relation to its acceptability among female lecturers in tertiary institutions and for this reason four basic constructs and structured concepts which form the basis of this development are defined such as innovation, Akwete fabric acceptability and special occasion.

Innovation

An innovation is any good, service or idea that is perceived by someone as new. The idea may have a long history but it is an innovation to the person who sees it as new. An innovation is also perceived as having a life cycle, that is, it is born, matures, and dies. Rogers (1983) defines an innovation as a design or product perceived as new by an individual. He also holds the opinion that once innovation occurs, there is diffusion of innovation which is the spread of an innovation within and across social systems, that is, it trickles within, up, down and across the society. He further spells out the rate of change as including characteristics of the product, the market or audience, the distribution cycle and those characteristics of individuals and societies. Bateman and Snell (2002) defines innovation as a change in technology, a departure from previous ways of doing things. They further claim that there are two types of innovations – process and product innovation. Drucker (2004) defines innovation as the task of endowing human and material resources with new and greater wealth – producing capacity. He is of opinion that each product is developed as a result of a new capacity to provide a competitive service fashioned out of existing and perceived knowledge, to meet a new need of an old customer or to make old services suitable for new customers.

Akwete Fabric

Akwete cloth refers specifically to the cloth woven in Ndoki town of Akwete in Ukwa East local government area of Abia state Nigeria (Otuka, 2009). According to him, the cloth is usually made of cotton threads in combination with colourful threads of heavier texture in order to achieve decorative pattern and effects. Akparanta (2009) defined Akwete cloth as one of the finest local hand woven fabrics in the world which is

produced in Nigeria by Akwete community hence its name Akwete cloth. She pointed out that this cloth is used by fashion conscious women as wrapper for high society ceremonies, and is also sewn into traditional attires and worn by men of taste for special outings.

Onyeneke (1996) in Ekumankama (2004) opined that the indigenous knowledge of producing Akwete fabrics had been part and parcel of the people in Abia state particularly Akwete people, and that they possess great ability in getting their designs to conform to the development programmes in the state. Wanda (1994) stated that Akwete fabrics are produced from either cotton or silk yarns since Abia state is blessed with resources such as cotton obtained from cotton plants from their farms, therefore, the production of this cloth is easy. Oguntona (1986) and Murray (1983) reported that Akwete fabrics are used as wearing apparels, for industrial purposes, and home furnishings. It is also useful and beneficial to some churches and women organizations for their uniforms and cultural groups like cultural dancers who want free movement when dancing.

Acceptability

Thesaurus dictionary defines acceptability as satisfactoriness by virtue of conforming to approved standard. According to Merriam Webster Dictionary, Acceptability is the quality or state of meeting ones need adequately. Also Your Dictionary defines acceptability as something that is considered satisfactory or within the realm of what is appropriate or something that is tolerable but necessarily desired. Acceptability deals with reply or answer by word or action. It also means giving a feedback over a disseminated information verbally or through reactions. Acceptability

can be seen in a way of appreciation over an act or it can be shown through receiving or acceptance of a product or anything or idea newly introduced or displayed. According to Thordike's law, product or idea introduced is the stimulus while the acceptability is the response and response can be negative or positive. In a negative response, it means the idea is rejected or not accepted while in the positive response, the idea is accepted. To this effect acceptability in relation to Akwete fabric goes with how female lecturers appreciated, or their attitude towards this product after it has been innovated or improved.

Special Occasion

Special occasion refers to an event which does not frequently occur, it is kind of event that usually occurs once in a while, which requires special or different kind of attire's or wears that are set aside for it. Cambridge dictionary defines special or formal event as a particular time especially when something happens or has happened such as wedding ceremony.

2.2 Fabric Construction

The construction of fabric today is a blend of ancient arts and modern technology. According to Jackman and Dixon (1990), automated equipment and new methods of bonding make possible entirely new fabric and its construction faster and easier, though felting and weaving, the oldest techniques are still viable as ever. Flugel (1998) and Down (2000) agreed that fabric can be made by using a number of techniques and from fibres, yarns or from a combination of both. Down (2000) specifically emphasized that fabric construction implies the way the warp and the weft threads, are woven in a pattern. Weber (1990), Flugel (1998) and Down (2000) outlined the following techniques which fabric can be made as weaving, knitting, non-woven, braiding, netting, and lacing and they observed that the two commonest methods of fabric construction namely weaving

and knitting which are considered most important, use yarn and out of the two techniques, weaving is the focus of the sub-heading.

2.2.1 Use of Yarns

Yarns are spun threads used in weaving or building, they can be made of cotton, silk, rayon, wool and so on. According to Dauda (2003) yarns are linear assemblage of fibres or filaments formed into a continuous strand having textile-like characteristics. Nkeonye (2009) define yarns as long continuous strands composed of parallel fibres held together by twists, when woven into fabric, the yarn is often referred to as thread. Dauda (2003) and Nkeonye (2009) agreed that the process of yarn manufacture is called spinning and that most yarns produced today are spun by traditional ring-spinning method but some are made by non-conventional open-end spinning technique. They also observed that the processing of yarn is governed by the twist and the count, which is the total number of ware and weft per square centimeter of a woven fabric. This tells about the quality, durability and wear life of a fabric, of which either can be varied to give yarn required characteristics, for instance a fabric composed of yarns with high level of twist has higher bending stiffness, less compressibility lower cover and lower surface friction than a fabric of low twist yarn. In addition increase in amount of twist inserted in a yarn also increases its resistance to abrasion and tensile strength to some extent.

2.2.2 Weaving

Weaving is a major process of making fabric or cloth. In it, two distinct sets of yarns called the warp and the filling or weft are interlaced with each other to form a fabric. Jackman and Dixon (1990) defined weaving as the interlacing of two sets of yarn at right angle to each other, while Flugel (1998) similarly stated that in weaving, two sets of yarns are interlaced at right angle to one another in an established sequence. In the

same vein Down (2000), described weaving as a process whereby two yarns, the warp and the weft are woven together at right angles. The threads of the warp yarn are strong and runs the length of the loom, while weft thread are woven between the warp threads using a shuttle which moves backward and forward across the warp threads. On the loom, the warp threads run through the heddle which can be raised and lowered. When raised, it creates a shed (space) for the shuttle to pass through. Therefore by lifting different warp threads, pattern are woven into the fabric. Travis (2003) observed that as far as weaving is concerned that the intended yarn for the warp goes through some processes like spooling, warping and slashing to prepare them to withstand the strain of the weaving process.

Furthermore, he observed that there are four major operations involved in weaving. These are shedding, picking, beating up (battening) and taking up and letting off and these are detailed as follows:

- **Shedding**: In shedding, each alternate warp yarn is raised to insert the filling yarn into the warp to form a shed (space).
- **Picking**: As the warp is raised, the filling yarn is inserted through the shed-shuttle loom, shuttleless looms, circular loom and so on.
- **Beating (Battening):** With each picking operation, the reed pushes or beats each filling yarn against the portion of the fabric that has already been formed, to give it a firm, compact construction.
- **Taking up and Letting off:** With each shedding, picking, battening operation, the new fabric must be wound on the cloth beam which is called “taking up”, at the same time the warp yarns must be released from the warp beam which is

called “letting off”. As the shuttle moves back and forth across the width of the shed, a self edge is woven called selvage or selvedge. The selvedge prevents the fabric from muddling. This portion of the cloth is more compact and stronger than the rest of the fabric. All these operations are peculiar to handloom which are done manually but with modern technology, automatic looms are being used to carryout weaving at a fast rate. Woven fabrics are not always plain and checked. Some special effects are being created to make them highly attractive and durable. According to Flugel (1998) many of them have designs, and if these designs are created on the loom, they are called woven designs. The designs can mainly be due to;

a. Selection of yarn and
b. Selection of weave.

Flugel further stated that while making a fabric, if the warp is simple, and the weft complex, an interesting effect, different from plain fabric is obtained. These effects can occur as stripes or checks and the vertical stripes are created also by putting coloured warps at a distance and horizontal stripes by using coloured weft at a distance too, and to make check both warp and weft selected are coloured. Down (2000) established the fact that some designs are created in a fabric using automatic machines while weaving for instance, in a jacquared weaving each warp yarn is lifted individually using an electronic control system, to make an intricate weaving pattern against a plain background. Gilligan (2010), also admitted that when designs are being created by selection of special yarns or colour, the main effect is due to texture, but in order to get intricate woven

designs, the way in which yarns are interlaced can also be changed. Again, intricate patterns are created by changing frequency of interlacement. The designs as mentioned can be found in fabrics like denim, corduroy, or towel. In denim, a dominant diagonal line are found, in corduroy, there are raised parallel vertical lines, while towel bears loops placed in such a way that even if one loop is pulled, the fabric remains intact (Gilligan, 2010). All these fabrics are made by using special techniques of weaving and special loom and as such these fabrics become comparatively expensive.

2.2.3 Origin of Cloth Weaving in Iboland

According to archaeologist and anthropologists, the earliest clothing probably consisted of fur, leather, leaves, or grass, draped or wrapped or tied about the body for protection from the element, covering the nakedness and for adornment (http://www.dovrein avon.com.pdf/Begedsimla.JBQ.pdf).

Good (2006) observed that in all early cultures, one garment form, the tunic was common, regardless of the contact between them. Each kingdom, tribe or country adapted and refined this early garment to meet the needs of the established social order. In Iboland, the earliest clothing also existed but gradually, these garments were refined and pave way to majority of loin cloth known as “Akwete” which came in the form of simple length of fabric, rectangular in shape taken directly from the loom on which it was woven (Isichei, 2006).

Weaving was one of the ancient and widely spread craft in Iboland. Isichei (2006) stated that textile manufacture in particular reached a high degree of excellence during the pre-colonial days that cloth was made locally using hand loom. And the most towns

popularly known for this were Igbo-Ukwu and Akwete from which the name originated. According to Isichei the weavers made cloth called “Mkpuru Olulu” (wrapper tied from round the chest down above the ankle), from cotton plant which was planted in their farms. This was harvested during the dry season and spun into yarns (threads) and later woven into cloth. Isichei further observed that there was another type of plant called “Ufa” plant, suspected to be flax plant found in the forest which were also used in weaving by the weavers. The bark of this plant contained fabric-like material, out of which threads for weaving cloth could be made. When these plants were collected, they were split to remove the useless portions and were soaked and boiled and finally dried under sun. at this stage, the weaver takes them in bits to produce long threads which were then arranged in bundles and the bundles were woven into cloth, both “mkpulu olulu” and “ufa”, after processing end up as cream coloured threads, hence the cloth produced is white. Isichei also observed that some weavers produced cloth with red and black patterns, made from “ububa ukpukpa” red plant young leaves which were soaked in water and kept under sun for a day, with the end product as red and some bundles of threads were soaked in this liquid for some hours then dried under sun and these were used to make red designs on the cloth by using a mixture of red and white threads when weaving. In addition, there existed also another plant used for dyeing called “Akonogbe” plant, the bark of this plant was also processed like the former but just differed in colour which is black and threads were dyed in it and used for making black designs on cloth. With the advent of white man, many weavers abandoned spinning processes of the local thread and resorted to purchasing threads for weaving of assorted colours from the white man,

therefore it continued up to date that our weavers use foreign threads in weaving our local Akwete fabric in Iboland.

According to Akparanta (2009) this cloth is one of the finest local hand woven fabrics in the world produced in Nigeria by the Akwete community, hence its name Akwete cloth. Akwete cloth refers specifically to the cloth woven in Ndoki town of Akwete in Ukwa East Local Government Area of Abia state (Otuka, 2009). Akparanta (2009), Otuka (2009) and Wanda (1994) in Ekumankama and Uka (2004) were of the same view that the basic Akwete cloth is usually made of cotton thread, since Abia state is richly blessed with abundant cotton plant from which the cotton lint is obtained, spinned and used in local weaving, using hand loom. These authors observed that Akwete weaving grew between the middle and late nineteenth century, from part-time activity that occupied most women, to full-time occupation in which Akwete women participated. According to them, the weavers responded to the patronage of the neigbouring Ijaw people of Niger-Delta devising novel techniques to create desired patterns in new textile materials. Just like most women's weaving throughout Nigeria, Akwete weaving is done on an upright or vertical loom with continuous warp and other accessories. The fabrics are produced in a wide range of patterns from plain striped to geometrical motifs of domestic animals. Some weavers derived their sources of pattern motifs from mere inspiration and imagination, while others copied or made original drawings of their own.

Otuka (2009) viewed that the elaborately modern versions of Akwete cloth could be made entirely of silk, rayon, polyester and lurex, with decorative patterns. The decorative motifs have names which are suggested by their appearance or the innovators of such motifs. Furthermore, he added that these decorative designs and motif were offset

by a certain woman called Dada Nwakata who invented the technique of designs and wove it in secret so as to prevent others from copying her ideas, so she flourished about the period of the first contact with the Portuguese, and made impact on the traditional weaving technology which remained a living guide post in the search for sustainable innovativeness and creativity in traditional textile. Onyeneke (1999) pinpointed that Akwete weavers not only use indigenous patterns like “Ebe” and “Ikaki” but also incorporated new designs borrowed from other societies and this idea made their work novel and unique.

The decorative pattern of Akwete cloth ranges from plain stripes to very complex motifs. The embellishment motifs on Akwete cloth include domestic animals and ritual objects floated over the plain background cloth. According to Otuka & Akparanta (2009) Akwete weavers are constantly incorporating new designs with some exhibiting modernized influences. Some of these designs are nnadede, air condition and nnunu as having modern motifs. He pointed out that air conditioned cloth is derived from a complete non indigenous motifs.

The Ikaki motif is a fashioned tortoise, Otuka emphasized that the tortoise is a sign of peace in Iboland. He added that whenever peace making was attained by two villages, a tortoise’s leg was pulled out and nailed to the ground in-between the boundary as a symbol of tranquility in enemity between the disputing villages. He discovered that the Ikaki motif which is a diamond shape, has its tortoise-like fore and hind legs extended over the background cloth forming two parallel lines while its Lozenge body lies between the legs as the Ikaki cloth motif. Ikaki or tortoise is also present on the other

contemporary Nigerian cloths such as Ijebu Ode cloth woven in Ogun state. Ikaki is similar to Ijebu Ode "Oni" motif it is therefore copied form Ijebu Ode people.

The indigenous Akwete motifs include "Ebe" and Ikaki. He stated that the Ebe motif is a dumb-bell object which is varied in shapes of "ebe afo nkpo", ebe aghirigha, ebe olu ngalasi, ebe akara, ebe, uhie, ebe olu ochi and ebe ukwu bench, as shown in Appendix II.

2.3 Materials and Tools

The materials used in the production of Akwete cloth as outlined by Otuka (2009) are as follows: Loom, heddle, beater or sword, yarn, twine, brass, spatula, wooden shaft, shuttle, wax, ropes and warp spreader. He opined that the processes involved in the production of Akwete cloth may not be quite strenuous, but involves a series of complex activities, which require creative skills, perseverance and concentration to accomplish. During the process, the weaver sets up the loom frame by tying the horizontal beams in place with the aid of thick ropes (crondon), this leaves the beams suspended in such a height as to determine the length of the cloth.

Secondly, the weaver warps the yarns continuously across the upper horizontal beam and the lower one at the base of the loom. This is usually done from the left hand side to the right. When the width of the cloth has been determined, the weaver knots the end of the thread to the beams. After this stage, the weaver fixes the component by tying or knotting the twines in spiral or "8" shaped movement along two long slender sticks to form the heddle. This helps to select the warp in alternate order. During the process of gripping and pulling the heddle the sword or beater is inserted to form the "shed". This at the same time holds the shed open for the shuttle to pass through in more complex

applications, supplementary heddles are used to achieve great designs. In this wise different combination of warp threads are selected in each respective grouping.

Furthermore, he stated that this is followed by the weaving proper. Akwete cloth weaving is a process that involves passing the shuttle which carries the weft thread through the shed created by pulling the heddle and at same time beating it down onto the cloth with the beater stick, then from the other side the beater is pulled out and the wooden shaft fastened. The beater is inserted again through the other side, so the process continues until the cloth is woven to the top. At this point the tension ropes holding the horizontal beams are released, so that the unwoven parts of the cloth could be brought forward, while the woven parts are drawn to the back of the loom.

2.4 Design

Design is the arrangement of line, shape, space, colour (value) and texture. It can also be seen as a visual process in which something new is created as planned by a costume designer. When designing, the designer can create and execute a novel design through his/her imagination, or can adopt another person's design as a source of inspiration. Risley (1984) perceived design as figure and background. According to him designs also can come in the form of visual ideas of drawings, photographs done by ones self or could be information from any source in the form of printed materials which could include photographs and illustration of all kinds, from current magazines, newspapers and books. Risley added that when designing, that the qualities to look out for, are the pattern, shape and texture.

Cambridge Dictionary of American English (2000) defines design as the creation of a plan or convention for construction of an object or a system, such as in architectural

blue, print, engineering drawings, business processes, circuit diagrams and sewing patterns. Dorst and Nigel (2001) defined design as a roadmap or a strategic approach for someone to achieve a unique expectation. Furthermore they stated that design defines the specifications, plans, parameters, costs, activities, processes and how what to do within legal, political, social, environmental, safety and economic constraints, in achieving that objective design can more formally be defined as a specification of an object, manifested by an agent, intended to accomplish goals in a particular environment, using a set of primitive components, satisfying a set of requirements, subject to constraints, (Ralph and Wand, 2009). They added that specification can be manifested as either a plan or a finished product while primitives are the elements from which the design object is composed. They also pointed out that to design is to create a design where the designer operates (in an environment).

Design as a Process

Design as a process has a substantial disagreement which exists concerning how designers in many fields, whether amateur or professional, alone or in teams, produce designs. Dorst and Dijkhuis (1995) argued that there are many ways of describing design processes and discussed two basic fundamentally different ways both of which have several names, which they stated that the prevailing view has been called 'The Rational model", or "Technical Problem Solving" or "The Reason-Centric perspective" and the alternative, called "Reflection-in-Action" or "Evolutionary Design" or "Co-evolution' or "The Action-centric Perspective".

The Rational Model

According to Dorst and Dijkhius (1995), the rational model was independently developed by Simon, Pahl and Beitz. It posits that designers attempt to optimize a design candidate for known constraints and objectives.

- The design process is plan-driven.
- The design process is understood in terms of a discrete sequence of stages.

This rational model is based on a rationalist philosophy and underlies the Waterfall model systems development life cycle and much of the engineering design literature. According to the rationalist philosophy, design is formed by research and knowledge in a predictable and controlled manner (Simon, Pahl, and Beitz, 1996). In Rational Model, Dorst and Dijkhuis (1995) agrees with Simon, Pahl and Beitz (1996) that there are sequence of stages involved.

According to these authors the Rational model has been widely criticized on two primary grounds, which are:

1. **Designers do not work this way:** this implies that designers do not act as the rational model suggested as discovered through empirical studies.
2. **Unrealistic assumptions:** This also implies that goals are often unknown when a design project begins, and the requirements and constraints continue to change.

The Action-Centric Model (Perspective)

Dorst and Dijkhuis (1995), Simon et al. (1996) and Eekels (2000) opined that Action-centric model is a label given to a collection of interrelated concepts, which are antithetical to the rational model. It posits that:

- Designers use creativity and emotion to generate design candidates.
- The design process is improved.
- No universal sequence of stage is apparent meaning that anlaysis, design and implementation are contemporary and inextricably linked.

This model is based on an empiricist philosophy and broadly consistent with the Agile approach and amethodical development, (Dorst and Nigel, 2001). According to Ulman (2009) substantial empirical evidence supports the veracity of this perspective in describing the actions of real designers. He stated that Rational Model, the Action-Centric model sees design as informed by research and knowledge, however research and knowledge are brought into the design process through the judgement and common sense of designers by designers thinking on their feet, more than through predictable and controlled process stipulated by rational model. Designers context-dependent experience and professional judgement take centre stage more than technical rationality (Ulman, 2009).

Description of Design Activities

Dorst and Nigel (2001) stated that at least two views of design activity are consistent with the Action-Centric Perspective, and both involve three which are as follows:

The Reflection-in-Action Paradigm, Here the designers alternate between "framing" making moves and evaluate moves. Framing, they emphasized refers to conceptualizing the problem that is defining the goals and objectives. A move is a tentative design decision and the evaluation process may lead to further moves in the design (Dorst, and Nigel, 2001).

In the sense making – Co-evolution – implementation framework, Cross (2006) emphasized that designers alternate between its three titular activities. He said that sense making includes both framing and evaluating moves. According to him implementation is the process of constructing the design object while co evolution is the process where design agent simultaneously refines its mental picture of the design object based on its mental picture of the context and vice versa. However, according to Cross (2006) this perspective/model is relatively new and as such it has not yet encountered much criticism only one which is that it is less intuitive than rational model.

Philosophies for Guiding Design

Design philosophies are fundamental guiding principles that dictate how a designer approaches his/her practice. Simon (1996) viewed design philosophies as tools for determining design goals. According to him a design goal may range from solving the least significant individual problem of the smallest element, to the most holistic are usually for guiding design, though conflicts over immediate and minor goals may lead to questioning the purpose of design, perhaps to set better long term or ultimate goals. Reflections on material culture and environmental concerns (sustainable design) can guide a design philosophy, example is “first things first manifesto” was launched within the graphic community and states “we propose a reversal of priorities in favour of more useful, lasting and democratic forms of communication – a mindshirt away from product marketing and towards the exploration and production of a kind of meaning with the scope of debate that consumerism is running uncontested therefore it must be challenged

by other perspectives expressed, in part, through the visual languages and resources of design (Simon, 1996).

Approaches to Design

Brooks (2010) had it that a design approach is a general philosophy that may or may not include a guide for specific methods. Some are to guide the overall goal of the design. Other approaches are to guide the tendencies of the designer but a combination of approaches may be used if they don't conflict. Some of the popular approaches include:

- Kiss principle (keep it simple stupid), which strives to eliminate unnecessary complications.
- There is more than one way to do it (TIMTOWTDI), a philosophy to allow multiple methods of doing the same thing.
- Use-centered design, which focuses on the goals and tasks associated with the use of the artifacts, rather than focusing on the end user.
- User-centered design which focuses on the needs, wants, and limitations of the end user of the designed artifact.
- Critical design which uses designed artifacts as an embodied critique or commentary on existing values, morals and practices in a culture.
- Service design which deals with designing or organizing the experience around a product, the service associated with a product's use.
- Transgenerational design, the practice of making products and environments compatible with those physical and sensory impairments associated with human aging and which limit major activities of daily living.

- Speculative design, the speculative design process doesn't necessarily define a specific problem to solve, but establishes a provocative starting point from which a design process emerges. The result is an evolution of fluctuating iteration and reflection using designed objects to provoke questions and stimulate discussion in academic and research settings.

Method of Designing

According to Brooks (2010) design methods in a broad area that focuses on;

a. Exploring possibilities and constraints by focusing critical thinking skills to research and define problem spaces for existing products or services or the creation of new categories.
b. Redefining the specifications of design solution which can lead to better guidelines for traditional design activities 9graphic, industrial, architectural etc)
c. Managing process of exploring, defining, creating artifacts, continually over time.
d. Prototyping possible scenarios, or solutions that incrementally or significantly improve the inherited situation.
e. Trend spotting that is understanding the trend process.

Design in Clothing

In fabric making, there are two types of design that could be used namely: Applied and structural designs.

Applied design: This involves decoration on the fabric or garment, it could hand or machine designing. It could also be done by application dye or ink, using various techniques as printing by stencil printing, batik, tie-dyeing and marbling and by

attachment of laces, trimmings and motif and the likes. Majory (1980) stated that printed fabrics are those that have been decorated by motif, pattern or designs applied to the fabric after it has been constructed. He also added that all printed materials both on fabrics and on papers are applied design.

Structural design: This is the constructive design that depend on the Silhouette and fabric, and also it is determined by its pattern and is considered economical because it is classic (constant). In addition Down (2000) stated that when drawing Silhouette for fashion ideas, it is helpful to practice and produce different poses one is happy with in order to make the design classic. It should be noted that designs cannot be effective without some artistic guide lines and these guidelines are known as principles and elements of design and both cannot do without each other otherwise the design is flat. Principles of design are therefore the rules or artistic guidelines for using the elements of design which are line, texture, colour(value), form (shape) and space.

The researcher used the applied and structural designs as the platform for the research topic of acceptability of improved Akwete fabric for special occasion for female lecturers in tertiary institutions.

Designs In Akwete

According to Otuka (2009), there are two basic ways through designs can be added on the cloth. This is either through inlay technique or by the use of supplementary heddles. The inlay technique involves a process where the designs or motifs are applied unto the fabric by the use of the brass spatula to select a combination of few warp thread at a time. The spaces thus created are lined with yarns of contrasting colours, texture or thickness. This is later beaten down with the spatula and finally with the beater, thereby

allowing the design to be inlayed in the cloth. This process continues until the motif is completed.

The second method is by the use of supplementary heddles which involve a combination of heddle actions to achieve designs and patterns. This is the most complex part of Akwete weaving, in it the predetermined design pattern are selected with these heddles and applied respectively with different colours of yarn as the weaving progresses, with the resultant effect of the designs appearing at the reverse side of the finished fabric. Hence the ornate pattern in Akwete cloth, combined with its vibrancy of colours and finishing, mirrors the aesthetic drive of the weavers, hence the power of innovation and economic empowerment are the propelling forces behind this traditional textile's achievement.

Uses of the Akwete Cloth

Otuka (2009) observed that every fabric has its own uses as it applies to the culture and traditions of its weavers. Apart from the fundamental use of fabric, which is covering of nakedness and protection against the elements, the Akwete cloth could be used in the following outfits.

- **Wrapper:** Women usually tie the cloth as a wrap-round skirt (wrapper) with blouse of light weight machine made fabric. The cloth is usually woven in pairs and Ibo women wear the two wrappers on public occasions. The first one tied to reach the ankle while the second to mid-half length.
- **Men's shirts:** Men in their own case use the fabric to sew traditional shirts popularly known as jumper, wokor or etibo. These they wear over trousers for

special occasion too. The cloth may also be woven to smaller versions that could be used as curtain, cushion, table, lantern or bed covers.

- **Hoods and Stoles:** The fabric is also used in sewing of vestments like priests' stoles and graduation hoods.

Hence from the outlined uses of Akwete, yet the fabric was abandoned by female lecturers for special occasion, because of its weight and coarseness to the skin, therefore the need for this research became obvious.

2.4.1 Problems Associated with Akwete fabric

Ekumankama and Uka (2010) stated that the problems that hinder the production and usage of Akwete fabric are many such as insufficient manpower for production, time consumed in the processs, insufficient raw materials, poor demand due to its heavy weight and low rate of improvement in technology. They observed that among all these problems that the weight of this fabric is the highest discouragement people encounter in the usage which leads to its poor demand. According to them, the maximum weight of a sample set of Akwete fabric is about two kilograms, and with this weight, it is quite clear that this fabric is heavy. Otuka (2009), opined that the basic Akwete cloth, is usually made of cotton threads which are not mercerized to reduce the weight and the addition of decorated pattern and effect with threads of heavier texture for contrasting colours, makes the fabric heavier, that women rejected it for their special occasions. Akparanta (2009) also pointed out that the weavers' creatively combine different colours from threads of different fibres that are not of the same weight with cotton yarns in an attempt to make this cloth beautiful, indirectly added weight to it, and this led to the rejection of this fabric

by fashion conscious women, because it no longer meet their taste and comfortability, thereby causing little or no demand at all.

This is in agreement with the report of Osuala (2000) who observed that the low demand for Akwete fabric due to the heavy weight, is a prevailing problem that is associated with the production of this fabric as indicated by the respondents, at Akwete weaving centre with a mean score of 4.5. However he suggested that textile scientists should conduct research on how to produce low weight Akwete fabric in order to overcome this problem. Furthermore, he suggested that workshops should be organized on improvement of the managerial skills of production as well. Wanda (1994) also observed in confirmation of the above findings, that this fabric is too bulky and exerts some weight on handling it, which is caused by using untreated cotton taken from the weavers' farms. Kucha (1989) in her experiment on whether Akwete fabric could be used for cold weather attire, discovered that this fabric has the following characteristics such as heavy weight and coarse texture as a result of the multiple number of plies of yarns used in the process of weaving, abrasion resistance quality, low thermal heat rate, low air permeability and strong resistance to breakage. From her own point of view, all these, recommended Akwete fabric to be good for cold weather wears, while in the other hand are the problems that made it not to be acceptable as special occasion wears, by female lecturers in tertiary institutions in Imo state. From these reviews the researcher concludes that Akwete fabric has heavy weight as one of the major problems that hinder its acceptability and frequent usage.

2.5 Empirical Studies

These are research works done by others that are closely related, relevant and serves as guide to the ongoing study which were reviewed as follows:

Ekumankama and Ukah (2004) conducted a research titled promoting entrepreneurship in Akwete fabric production in Abia state, Nigeria, with the main objective of identifying measures of promoting entrepreneurship in Akwete fabric production. Descriptive human survey was used. The population comprised the entire staff of Akwete fabric producers in the textile centres of Aba, Ministry of Arts and culture, Umuahia and Akwete weaving centre in Ukwa Local Government Area in Aba zone, and a total population of 260 was used for the study. Purposive random sampling was used to select 100 producers as the sample for the study. Questionnaire was administered to collect data from the respondents, and frequencies, simple percentages and mean were used to analyze the data. The findings revealed that there was low demand for Akwete fabrics due to its heavy weight and this in turns led to low production rate. There was also insufficient manpower, which hinders large scale production of Akwete fabric. Finally it was discovered that there was poor perception in organizing workshop which can bring improvement on managerial skills of production and marketing managers of Akwete fabric industries.

The findings of this research is of importance to the present study because it revealed some of the variables associated with poor demand and usage of Akwete fabric which form the basis of objectives one of this study which focused on reducing the weight by reducing the yarn count and changing the weave from basket weave to plain weave to enhance its smooth texture and changing the design of animal pattern to

embroidery pattern and floral design making the appearance attractive for female lecturers for their special occasions. However this study differs from the present study because it used descriptive human survey, while the present study used experimental design. The past research used purposive sampling method while the ongoing used multi-stage random sampling for selecting the sample for the study. Also the past study did not test hypothesis but the present study tested hypothesis using ANOVA and t-test at 0.05 level of significance, and data was analysed using descriptive statistics, while the past study used frequencies, simple percentage and mean to analyse the data.

Kucha (1989) carried out a survey and experimental research to find out if Akwete fabric could be adopted as costume for cold weather condition in Abia state. Both field and laboratory experiment were used and questionnaire was administered. The population comprised of 1000 males and females in Aba and Umuahia metropolis. By proportionate stratified random sampling 100 respondents both male and female were used as the samples for the study. Instruments like abrasion resistance machine, magnifying lenses, air permeability tester and questionnaires were used to collect data. Six null hypothesis were stated in line with the research questions.

The findings revealed that Akwete fabric has high resistance to abrasion which helps in its durability. The yarns used in weaving it showed much weight per unit length which contributed to its high weight. Also the air permeability of Akwete was so low that its high resistance to air flow recommends it as suitable apparel for cold weather. This study has a major contribution to the present research because its major findings stressed heavy weight and high resistance of Akwete fabric to abrasion which contributes to its durability, and also low air permeability which recommends it for cold weather apparel.

This linked it to the present research which intended reducing the weight and improving on the weave to reduce high resistance to air flow, so as to be acceptable for special occasion by female lecturers.

Dauda (2003) conducted an experimental research on the use of yarns for satisfactory construction of textiles. Three different fabrics were selected using purposive sampling method, and the fabrics selected were 100% cotton, 100% polyester and a blend of polyester and cotton at 50% each. The instrument used for collecting data was standard equipment in the laboratory which was used to make some observations. The objective of the study was to evaluate those properties which are considered to be influenced by yarn type especially for apparels and sheets. Percentages and means were used to analyze the data. The findings of the study revealed that fabric properties like thickness, crimp, shrinkage, yarn count, air permeability, tensile strength, abrasion resistance, thermal conductivity, drapeability, are dependent on the yarn type for satisfactory construction of textiles for particular end-use. The past study used experimental design for the research and the present study will adopt the same design for this study. The major finding of the past study will be beneficial to the present research as it is going to serve as a bearing in selecting the type of yarn to use that will be helpful in improving the texture of Akwete fabric. The title of this study also relates to objective one of the present research which intended using fine industrial yarn to weave and improve Akwete fabric thereby reducing the weight and coarseness. The instrument the past study used in collecting, data relates to the part of the instrument the present study used for data collection. Though the past research did not test hypothesis, the present study tested hypothesis using analysis of variance (ANOVA) and t-test. The past research used non-living things for the population

but the present research uses human being for population. Using industrial yarn to improve on the locally woven fabric meant for special occasion among female lecturers.

Lemchi and Nkaulor (2009) were involved in a study and investigated the acceptability of locally dyed fabrics (Batik and tie-dye) for clothing by female adolescents-implications for entrepreneurship in Alvan Ikoku Federal College of Education, Owerri Imo State Nigeria. Three research questions guided the study. The population for the study comprised of all the female students in this institution with a sample size of 126 students selected by multistage sampling technique. Structured questionnaire was used in data collection and mean was used to analyse the data. Some of the findings include that female adolescents use batik and tie-dye fabrics for making assorted kinds of clothing like beach wears, party wears and occasion wears. Improvement in the production of batik and tie-dye increased the acceptability and use by female adolescents and this inturn brought about high demand and good patronage hence creating job opportunity for school drop-out and young graduates. The findings of this study relate to the present research in one of the assumptions which states that after improving on Akwete fabric, that there is going to be high demand and patronage because of the acceptability and this will create job for the weavers again. Though the two researches have some relationships, both differ in some ways, such as the past research used descriptive survey design, with 126 respondents as sample, the ongoing study adopted experimental design with 200 subjects as the sample for the study. The past study involved one tertiary institution in Imo state, while the present study involved five tertiary institutions in the same state. The past study selected the sample by multistage sampling technique and questionnaire was administered but the present

research intends also used multi-stage random sampling method to select experimental subjects and score card was used to collect data. This data was analyzed using mean while the present study used ANOVA and t-test for data analysis. Though both researches worked on locally made fabrics for acceptability, the present research worked on improving locally woven fabric for special occasion among female lecturers in tertiary institutions in the same state.

Obeta (2006), carried out a study on perceptions of dress sense among female students of higher institutions in Abia state. The study adopted survey design and a structured questionnaire was used for data collection. The population comprised of all the female students in the four higher institutions in Abia state and a total of 200 female students were randomly selected using systematic random sampling method and mean was used to analyze the data. The major findings indicated that female students perceive dress sense as wearing expensive garments and clothes in vogue all the time. Among other issues observed in the study include factors that influence dress styles of female students and proper guidelines for good dress sense among female students. The study did not state and test hypothesis and also did not mention the type of fabric to be used in sewing their garment which the present study did. The study has some contributions to the present research because one of the findings stressed that dress sense is dressing to suit special occasion and this relates to objective three of the present research, which dealt on improving the design of Akwete fabric for special occasion for female lecturers.

Another finding among others which pointed out, that dress sense is wearing clothes that make one feel relaxed and comfortable in it, relates to the second problem stated in the present study where female lecturers are complaining and rejecting Akwete

fabric because they don't feel comfortable wearing it due to its coarse texture. The study also adopted survey design and was conducted in Abia state Nigeria among female students in four higher institutions, but the present research adopted experimental design using score card and standard equipment to collect data in five tertiary institutions in Imo state, Nigeria among 2000 female lecturers. Like the past research, the ongoing research adopted experimental design. The past research used a population of 1000 and 100 as the sample, while the present study used a population of 2000 female lecturers and a sample of 200 respondents. Apart from the similarities and differences in both researches, the on-going research focused on reducing the weight of the locally woven fabric by reducing the yarn count and changing the weave, so as to make the texture comfortable for the female lecturers and also improving the design for it to be attractive and acceptable for special occasion.

The past research used standard equipment and questionnaire for data collection while the present research also use standard equipment but score card instead of questionnaire in collecting data. The past research used proportionate stratified random sampling technique while the ongoing study will also use multi-stage random sampling method in selecting the sample from the population. Unlike the past research which stated six hypotheses, the present research stated four null hypotheses which was tested at 0.05 level of significance. The data of the present research was analyzed using analysis of variance (ANOVA) and t-test.

Ada (1985) conducted a research on the contemporary non motorized – looms and their weaving designs in the Nigerian army. The main objective of the study was to determine the fabric density through yarn counting and the analysis of an imported

Nigerian army corps belt in terms of tensile strength and abrasion resistance. The population of the study comprised of selected workshops and institutions that have weaving – training programs, specifically the weavers, teachers and administrators in both military and civilian section but the population was not defined. The design used were both experimental and survey and structured questionnaire and standard equipment were used to collect data. The finding of the study was that army corps belt can be produced locally using local equipment like vertical loom, table loom, and so on which was thought impossible that had led to constant importation of foreign army corps belt. Though the population of this study was not clearly defined, in terms of number, and hypothesis was not stated but the study has some contributions to make to the ongoing research. For instance the major finding relates to the present study in objective one and two which intended using the same loom to weave the improve Akwete fabric. The main objective of the past study also is similar to the present study in objective one which worked on reducing the weight of the fabric by reducing the yarn count and manipulating the weave to plain weave for a smooth texture after determining the density of the conventional Akwete fabric.

Saliu (1984) carried out a survey research on Okene cloth, its position in the contemporary cloth weaving in Nigeria. The objective was to assess the function and popularity of Okene cloth and extent its aesthetic characteristics affect the taste of the patrons. A sample of ten post primary and higher institutions were selected from ten Northern states, using purposive random sampling method, and questionnaire was used to collect data and the data was analysed using simple percentage, frequencies and mean. The findings revealed that the patrons were aware and they highly appreciated the

aesthetic and artistic value of the Okene cloth, which indicates that their taste were really met.

The findings of this research has some influences on the present research in its acceptability by the patrons which is the part of the main objective that intended determining the acceptability of Akwete, improved through the same weaving process. As with the past study, the present research took place in tertiary institutions but in the eastern Nigeria. Though the two researches have some similarities but they differ in some ways such as, the instrument the past research used was questionnaire for collecting data while the present research is going score card and standard equipment. The present study is not adopt the past study's research design because it used survey but the present used experimental design. The past study only focused on the aesthetic functions of traditionally woeven fabric, but not on the weight and the texture which was the focus of the present research which reduced the yarn count and changed the weave for a smooth texture for its acceptability by female lecturers.

Tselepis (2004) conducted a survey research on Early Adolescent girls' expectations about fit of clothes, in Pretoria, South Africa. The population for the study comprised of 500 clothing dealers and 1000 female adolescent girls. Purposive sampling method was used to select 150 samples. The objective of the study was to find out the relationship between the female adolescent girls' expectation about clothing and the fit. Three hypotheses and three research questions guided the study and questionnaire was used to collect data. The major finding of the study revealed that drastic physical changes of their body affect the fit of their clothes. Though the study specifically talked about the younger girls between ages 13 – 15 years however, the major finding relates to the on

going study in the sense that it spelt out that for a clothing article to be accepted by any female age level, it must fit the figure and aesthetically suit the occasion, it is meant for, which is the main focus of the present research which intended producing a well designed woven fabric that will fit their figure and be acceptable by the same female for their special occasion.

Though both studies resemble in some ways but differ in many aspects, instances are that the past research was a survey design which used questionnaire to collect data and was done among young adolescent girls in South Africa while the on going study was experimental design and used score card and standard equipment to collect data also among females but older females in tertiary institutions in Nigeria.

2.6 Summary of Related Literatures

Improving akwete fabric was an experimental research which involved Laboratory experimentation on conventional and improved Akwete fabrics, in order to collect data to determine its acceptability among female lecturers in tertiary institution, in Imo State Nigeria. The review of literature on fabric properties revealed that yarn type and the count affect the woven fabric in its drapability, weight, air permeability rate, thermal heat rate, its texture and comfortability.

The review on the problems associated with Akwete fabric revealed that its heavy weight is one of the most discouraging factors that hinder its frequent usage, especially as special outing wears.

The literature also revealed that the design on this fabric which were made of animals like tortoise, lizard, snakes and the likes made people dislike it, coupled with that those designs are out-dated.

The literature showed that the weight, compactness of the conventional Akwete fabric are good properties that recommended it for cold weather attire and not either as evening wears or special outing wears.

The literature also highlighted that Akwete fabric has high resistance to abrasion which helps in its durability which is as a result of the type of yarns and weave used in weaving it which showed much weight per unit length that contributed to its heavy weight. The review also revealed that when woven fabric is artistically designed that it increases its aesthetic function which determines its acceptability.

It is important to note that many researches have been conducted on Akwete fabric and the problems associated to it but all these researches could not proffer any solution to those problems, but they only made some suggestive measures. However, it seems that no research has been conducted on how to solve its major problem of heavy weight. This study intended filling that gap.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

This chapter presented the research design and methodology used in the study under the following sub-headings:

3.1 Research Design

3.2 Population for the Study

3.3 Sample Size and Sampling Procedure

3.4 Instrument for Data Collection (Materials)

a. Equipment

b. Materials

3.4.1 Validation of the Instrument

3.4.2 Pilot Study

3.4.3 Reliability of the Instrument

3.5 Procedures for Data Collection

3.6 Procedures for Data Analysis

3.1 Research Design

The research design used for this research was experimental research design. Experimentation is a practical demonstration of some concepts and as a research explores whether relationships exists among some identifiable variables and the nature of these relationships then sets control over them. According to Bello and Ajayi (2000) experimental research design is a design that provides a systematic and logical procedures of identifying and evaluating the relationship between variables that create a particular state of affairs under controlled condition. Singh (2006) also observed that

when certain variables can be controlled or manipulated directly in research problem, the research procedure is described as an experiment. In this design, laboratory experiment was carried out on producing improved Akwete fabric and the fabric was designed used for special occasion for female lecturers in tertiary institution in Imo state. The experiment was done in four stages under the following sub-headings:

1. Testing the Conventional Akwete Fabric
2. Production of Improved Akwete Fabric
3. Testing the improved Akwete Fabric.
4. Assessment of the Finished Product
    a. Training of the Respondents
    b. Evaluation of the Finished Product

Stage I: Testing the Conventional Akwete fabric

In the first stage, the fabric density test was taken. In it the original Akwete fabric was taken to the textile design and technology laboratory to be tested for problems that made its acceptability difficulty for female lecturers.

Stage II: Production of Improved Akwete Fabric

The second stage involved improvement on the fabric which was done by first reducing the yarn count of both the warp and the weft after which the yarns wasreeled and set on the floor loom and woven by the researcher in the industrial design laboratory.

Stage III: Testing the Improved Akwete fabric

In the third stage, the researcher took the improved Akwete cloth back to textile design technology laboratory to determine whether it has been improved.

Stage (IV) Assessment of Finished Products

a. Training of the Respondents

The researcher invited the female lecturers to the clothing laboratory of the various institutions, displayed the products and explained to them what the fabrics were and how to assess the finished product by touching following the instructions on the score card to record their observations and feelings about the product using the scoring key as contained in the a four point scale.

b. Evaluation of the Finished Product

The respondents following the instruction on the score card assessed the product and recorded their observations, after which the score cards was collected by the researcher for data analysis.

3.2 Population for the Study

The population of the respondents for this study comprised of all the female lecturers in five tertiary institutions in Imo State. 2000 female lecturers formed the target population, which comprised of Federal University of Technology Owerri, Alvan Ikoku College of Education Owerri, Federal College of Agriculture Umuagwo Owerri, Imo State University Owerri and Federal Polytechnic Nekede Owerri as shown by the statistical records of the senior academic staff of the various institutions.

Table 3.1: Population of female lecturers by their institution.

Various Institutions	Population
Federal University of Technology Owerri.	500
Alvan Ikoku Federal College of Education Owerri.	450
Federal College of Agriculture Umuagwo.	400
Imo State University Owerri	350
Federal Polytechnic Nekede Owerri	300
Total	**2000**

Source: Deans of Faculty of Education and Sciences Office Records of the Senior Academic Staff in five tertiary institutions in Imo State.

3.3 Sample Size and Sampling Procedures

Multi-stage sampling technique was employed in selecting the sample for the study. This comprised of three different stages. In the first stage two faculties were randomly selected from each of the five institutions. In the second stage, four departments were selected out the two faculties in each institution. This was because female lecturers were found more in these departments. In the third stage which was final stage, 10 female lecturers were selected in each of the four departments as follows:

a. Department of vocational and technical education = 10, b. Department of Education = 10, c. Department of Biological sciences = 10, d. Department of Chemistry = 10, making a total of 40 per institution. Thus the total sample size in the five institution was 200 respondents.

Table 3.2 Sampled respondents for the experiment.

Various Institutions	Population	Sample
Federal University of Technology Owerri.	500	40
Alvan Ikoku Federal College of Education Owerri.	450	40
Federal College of Agriculture Umuagwo.	400	40
Imo State University, Owerrri	350	40
Federal Polytechnic Nekede Owerri	300	40
Total	2000	200

3.4 Instrument for Data Collection (Materials): a. Equipment and b. Materials

a. Equipment

For this experiment, the instruments that were used for collection of data were score card and standard equipment sourced from textile design technology laboratory (see appendix viii):

1. Magnifying lens that helped to check the fabric set, that is the number of ends (plies when the fabric was viewed under it, per one square centimeter of both the weft and the warp.
2. Drape meter used to determine the circumference of the fabric tested for drapability.
3. Drape tester used for testing the drapability of the fabric both conventional and improved Akwete.

4. Air permeability tester which helped in determining the amount of air flow in a fabric, that determined the comfortability of the fabric to the weaver.
5. Weighing balance was used in finding the weight of the fabric after passing through the drape tester.
6. Loom for weaving the improved Akwete was gotten from industrial design studio.
7. Score card was designed by the researcher which has a four point response format according to the variables such as weight, coarseness, appearance and acceptability.

After the experiment, the respondents were invited to the clothing laboratory of each institution and 200 score cards were distributed to them by the researcher. The researcher explained to them how to examine by observing and touching the fabric and record their observations on the product in the score card using a four point format scale, ranging from 1 to 4, with their corresponding score keys. This technique was employed to test the quality of the product by its weight, texture appearance and acceptability. Table 3.3 shows the sample of score card.

Instruction: Before you are two samples of finished products, please handle, evaluate and record your observations in the score card using the scoring keys with the corresponding numbers, to represent your observations.

Table 3.3 Score card

	P1					P2			
Variables	1	2	3	4		1	2	3	4
Appearance									
Texture									
Weight									
Acceptability									

P1 = Conventional Akwete

P2 = Improved Akwete

Scoring keys

Weight

Very light	4
Light	3
Heavy	2
Very heavy	1

Texture

Very smooth	4
Smooth	3
Slightly coarse	2
Coarse	1

Appearance

Highly attractive	4
Attractive	3
Fairly attractive	2
Not attractive	1

Acceptability

Highly acceptable	4
Acceptable	3
Not acceptable	2
Highly unacceptable	1

B. Materials

The materials used for the experiment were:

1. The conventional Akwete Fabric produced by the Akwete weavers of Ndoki town in Abia state.
2. Colourful industrial yarns bought from Kurumi market Kano.
3. Improved Akwete fabric, woven by the researcher

3.4.1 Validation of the Instrument

The researcher after drafting the score card, went through it in order to access its content validity, and after this exercise, the score card was given to senior lecturers in Home Economics, Educational research and statisticians to determine the face validity. During the process of validation, these experts adjusted the instrument from nine point Hedonic scaling system to four points format scaling system because the former is meant mostly for organoleptic assessment of experimental foods. They also advised that the codes like P1 and P2 be interpreted as shown in the score card for easy understanding. After this exercise the instrument was used for pilot study to ascertain the reliability.

3.4.2 Pilot Study

At the beginning the researcher produced two garments, one from conventional Akwete fabric and the other from improved Akwete fabric and used them for pre-test and post-test using the validated instrument, and the results were collected, and analyzed to ascertain if there were observed statistical significant difference between acceptability of the two products. After two days, pilot study was conducted in University of Nigeria

Nsukka in Enugu state for one week among female lecturers from three departments in Faculty of Education to determine the acceptability of the improved Akwete fabric using the validated instrument (score card). Ten female lecturers (Table 3.4) were chosen as respondents for the pilot study to assess the samples of the product. Score cards were distributed to them for recording their observations. The data collected were coded and subjected to appropriate statistical analysis using Spearman Correlation Coefficient Method to test the reliability of the instrument.

Table 3.4: The result of the pilot study conducted

Departments	**No. of cards distributed**	**No. of Acceptability response**	**No of unacceptability response**
Vocational teacher education	5	4	1
Home science, Nutrition and Dietetics	2	2	0
Educational foundations	3	2	1
Total	10	8	2

Source: Pilot study, 2011.

$$\text{Average percentage acceptability} = \frac{\text{Total No. of acceptability response}}{\text{Total No. of cards}} \times 100 = \frac{8 \times 100}{10} = 80\%$$

$$\text{Average percentage unacceptability} = \frac{\text{Total No. of unacceptability response}}{\text{Total No. of cards}} \times 100 = \frac{2 \times 100}{10} = 20\%$$

Reasons for Unacceptability

Their reasons for not accepting the fabric were that they disliked wearing traditional fabric especially hand woven ones, therefore they preferred foreign fabrics and also they liked dressing in western styles.

3.4.3 Reliability of instrument

An instrument is reliable when it is stable, dependable and measures accurately and consistently what it is supposed to measure when replicated giving similar, close or same result as it is administered (Asika, 2006). The statistical package for social sciences (SPSS) was used with Guttmann split – Half procedure for reliability coefficient and for determining the internal consistency of the instrument. The reliability coefficient of the respondents and that of pre and post-tests calculated were 0.80 and 0.89 respectively using Spearman Brown formula.

The reliability coefficient was positive therefore the instrument was considered reliable, based on the proposition of Murkherjee (1980), that the average value of correlation coefficient must be around 0.80 for an instrument to be considered reliable. In addition Zumbardo in Bello and Ajayi (2000) confirmed that in general, coefficients between 0.70 and 0.90 are considered good indication of reliability.

$$\text{Reliability} = \frac{2 \times \text{total \% responses}}{1 + \text{total \% responses}} = \frac{2 \times 0.80}{1 + 0.80}$$

$$1.60 = 0.888 \approx 0.89$$

$\therefore$ Reliability coefficient = 0.89

3.5 Procedures for Data Collection

There were four stages of data collection and it was done personally, through experiment, observation and the use of score card. The stages were as follows:

1. **Testing the conventional Akwete fabric:** The fabric density test was taken. This was done through the following experiments (a) yarn specification (b) yarn counting (c) thermal heat test (d) air permeability test and (e) drapability test. In it, the original Akwete fabric was taken to the textile design and technology

laboratory was tested to discover the problems that made its acceptability difficult by female lecturers, using the already mentioned equipment in 3.4 materials.

A. Yarn specification

The first step in yarn counting was yarn specification which was done to detect the number of plies in a yarn of both the warp and the weft. This was carried out using the magnifying lens. When the conventional akwete fabric was viewed under this lens, it was discovered that the number of plies in a yarn (thread) along the warp (vertical row) were eleven (11) and that of the weft (horizontal row) were six. Therefore in one centimeter square (cm^2) there were forty-four plies in four yarns plus four extra plies due to its inconsistency in arrangement or assemblage and thirty-six plies in six yarns along the weft. The improved fabric had two plies in a yarn in the warp which comprised of seven yarns, thus in one centimeter square (cm^2) there were fourteen (14) plies, while in the weft there were also two plies in a yarn, which comprised of ten yarns, thus in one centimeter square (cm^2) of the weft there were twenty (20) plies, as shown in table 3.5.

Table 3.5. Researcher's observatory report of laboratory experiment on weight of improved and conventional Akwete fabric by yarn specification.

Conventional						Improved				
Readings		**No of Plies /cm**	**Yarn /cm**	**Total plies /cm^2**		**Readings**	**No of piles/cm**	**Yarn /cm**	**Total plies/ cm^2**	
1.	Warp	11	1	4 x 11 + 4 =48	1,728	Warp	2	1	2 x 7 = 14	280
	Weft	6	1	6 x 6 = 36		Weft	2	1	2 x 10 = 20	
2.	Warp	11	1	4 x 11 + 2 = 46	1,656	Warp	2	1	2 x 7 = 14	280
	Weft	6	1	6 x 6 = 36		Weft	2	1	2 x 10 = 20	
3.	Warp	13	1	4 x 13 = 46	1,872	Warp	2	1	2 x 7 = 14	280
	Weft	6	1	6 x 6 = 36		Weft	2	1	2 x 10 = 20	
4	Warp	11	1	4 x 11 + 4 =48	1,728	Warp	2	1	2 x 7 = 14	280
	Weft	6	1	6 x 6 = 36		Weft	2	1	2 x 10 = 20	
5.	Warp	11	1	4 x 11 + 3 =47	1,692	Warp	2	1	2 x 7 = 14	280
	Weft	6	1	6 x 6 = 36		Weft	2	1	2 x 10 = 20	
Total plies in cm^2 of five readings					8,676			Total plies in cm^2 of five readings		1,400

The above table showed that in one centimeter square of five readings of both fabrics, the total plies found were 1,400 and 8,676 respectively.

This implied that there were higher concentration of plies in one cm^2 of conventional Akwete fabric than that of the improved fabric which constituted to the heavier weight of the conventional fabric shown as 83.8% difference. Thus any fabric with such high concentration of yarns tends to be heavy.

The difference = CAF – IAF

8,676 – 1,400 = 7,276

Weight difference = 7,276 plies

Percentage difference = $\frac{7276}{8676} \times \frac{100}{1}$ = 83.8%

B. Yarn Counting

Having detected the specification of yarn by one cm, then yarn counting followed, appendix iv from this point the length of the yarn was taken as 17cm by the width (1cm) and cut out, the rows of the yarns were stripped open and counted to ascertain the number

of plies and then placed on the scale and weighed. The weight calculated using the formular as shown in table 3.6 for each fabric.

Table 3.6: Researcher's Observatory Report of Laboratory Experiment on Weight of both Fabrics by Yarn Counting

	Conventional (RCA)	**Improved (RIA)**
	Reading/weight in grams	Reading/weight in grams
1	2.40	0.95
2	2.50	0.98
3	2.40	0.97
4	2.52	0.96
5	2.45	0.95
Total	12.27g	4.81g
	Formular = $\frac{W \times 1000}{L \times N}$ $\frac{12.27 \times 1000}{17 \times 5} = 144.3g$ Conventional Wt = 144.3g	Formular = $\frac{W \times 1000}{L \times N}$ $\frac{4.81 \times 1000}{17 \times 5} = 56.6g$ Improved Wt = 56.6g

Weight difference = 144.3g – 56.6g = 87.7g

Percentage difference

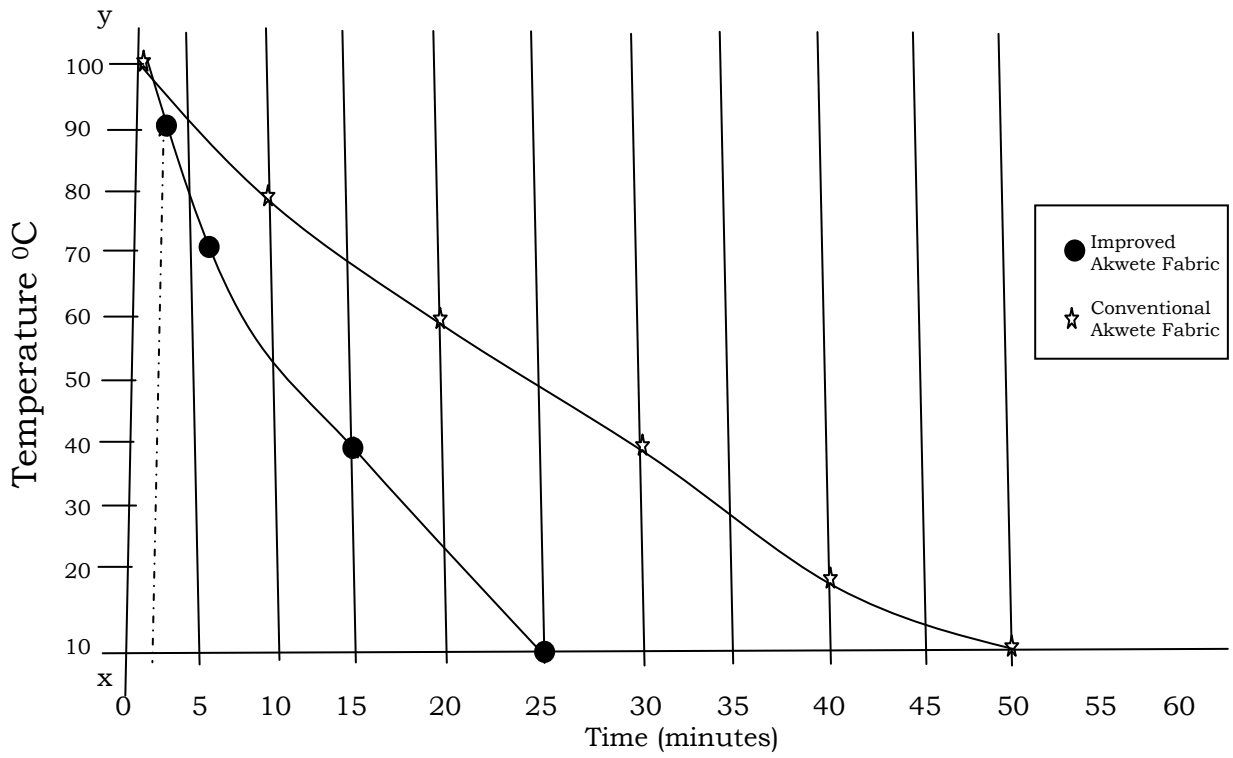
$$\frac{87.7}{144.3} \times \frac{100}{1} = 60.8\%$$

From Table 3.6 it was confirmed that there is difference in weight of 87.7g between the conventional and improved Akwete fabric. Conventional Akwete fabric showed 60.8% higher weight than the improved fabric which was 39% lighter weight. This is in line with the percentage difference exhibited by the quantity of plies which is 83.8% in table 3.5 which confirmed the finding that there were high concentration of yarns in the fabric so it contributed to its heavy weight, therefore conventional Akwete fabric had heavy weight as compared to the improved fabric. Therefore in conclusion the quantity of yarn that determines the weight of any fabric for it to be acceptable, must be considered. Thus, the more the quantity of plies the heavier the weight of the fabric.

C. Thermal Heat Test

In thermal heat experiment, both samples were cut of equal size and were fixed round a tin so that it formed a jacket round the tin. Boiled water at 100^0C was poured into the tin with rubber lid and on the lid was a small hole through which a thermometer was inserted and the rate of the temperature drop was noted at intervals of ten minutes (Appendix V) and as shown in the graph and in Tables 3.7a and 3.7b. From the experiment, the improved fabric lost heat to the atmosphere faster than the conventional fabric which showed that the improved fabric had lighter weight than the conventional fabric because the rate at which this fabric gave out heat to the atmosphere equals the rate at which it permitted air from the atmosphere because it has more opening for air passage to the body thereby making the body comfortable and cool during hot season which is one of the characteristics of a good textile fabric, which confirmed the texture to be smooth and soft to the skin because the yarn count had been reduced. Therefore as soon as the yarn count which was 8676 plies which was reduced to 1,400 plies as shown in Table 3.5 it affected the weight, from 144.3g, to 56.6g as shown in Table 3.6, in thermal heat graph and thermal heat rate in tables 3.7a and b which were 90^0C heat lost in 25 minutes for improved fabric and 90^0C heat lost in 50 minutes for conventional fabric, denotes that the texture was improved as indicated by the fast heat lost. In addition, the rate at which the air was permitted into the body (air permeability increased from 16.4cm^3 to 24.3cm^3 per second as shown in table 3.8 which affected the rate of the drop in body temperature, suggested the fabric to be comfortable.

Table 3.7a(i) and 3.7b (ii) Researcher's observatory report of laboratory experiment on coarseness (texture) of improved and conventional Akwete fabric by Thermal Heat Test (rate of heat loss)
Thermal Heat Graph



The y axis of the graph from 10^0C – 100^0C shows the temperature in degrees centigrade while the x axis of the graph form 0 – 60 mins shows the time in minutes per hour.

Table 3.7b The rate at which both fabrics lost heat as shown in the graph (Table 4.2.2a(i))

CA: Conventional Akwete	IA: Improved Akwete
CA^{0}C/Mins	IA^{0}C/Mins
90^0C in 0Mins	90^0C in 3 Mins
80^0C in 10Mins	70^0C in 7 Mins
60^0C in 20Mins	40^0C in 15 Mins
40^0C in 30Mins	10^0C in 25 Mins
20^0C in 40Mins	- -
10^0C in 50Mins	- -
Total = 90^0C heat lost in 50 mins	Total = 90^0C heat lost in 25 mins

D. Air Permeability Test

In this experiment, Shirley air permeability tester was used to carry out the assessment of permeability of both fabrics (Appendix VI). Ten millimeter cube (mm^3) of water pressure was passed through one centimeter square ($1cm^2$) of fabric at five consecutive times as recorded in Table 3.8 with the totals and averages. It was discovered that air penetrated faster and easier through the improved fabric than the conventional fabric as shown in their difference which was $7.9cm^3$ faster due to the following circumstances associated to it like the area of opening between yarns, the depth of each opening as is related to the fabric thickness, and the number of openings per unit area of the fabric, thus bigger openings means higher flow rate of air through fabric. Invariably the thicker a fabric is, the more difficult it is for air to flow through the fabric, which is also as result of the number of plies in a yarn which led to its compactness and coarseness that air cannot penetrate through it to the body therefore the body feels uncomfortable in such fabric. Thus the improved fabric has smoother texture than the conventional fabric because it is light and cool on the body. This also confirmed the findings in Table 3.7a and b that the improved fabric is smooth and light in weight due to its ability to loose heat to the atmosphere which means that as it loses heat, it gained air that caused the drop in the temperature.

Table 3.8: Rate at which air was permitted into the body (air permeability) by both fabrics

Difference	**Samples of fabrics**	**Air Permeability**					**Total**	**Average Air in cm^3/sec**
		1	2	3	4	5		
24.3 – 16.4	Conventional	21.2	20.0	15.4	13.6	12.0	82.2	16.4
= $7.9cm^2$	Improved	26.0	25.3	24.3	23.1	22.6	121.3	24.3

E. Drapability Test

The two fabrics were placed together with cardboard paper and drape meter was placed on them and cut. The pieces were placed on the drape tester to detect how they drape (fall freely). As they draped, their shadows were traced on the cardboard paper. The papers were removed and weighed for initial weight (M_1), and after the initial reading, the papers were cut from the traced drape shadows and weighed again for the final weight (M_2) as were recorded in table 3.9 and the drape coefficient calculated as 38.10g for improved fabric and 65.02g for conventional with a difference of 26.92g. From the table, the improved fabric having fabric 38.10g coefficient showed more flexibility than the conventional fabric, indicating that the improved fabric was smoother in texture that is, the coarseness has reduced than the conventional, therefore it is comfortable and acceptable for special occasions.

Table 3.9. Researcher's observatory report of laboratory experiment on Drapability of improved and conventional Akwete fabric.

Sample of fabrics	Drape	1	2	3	4	5	Total	Average	Drape coefficient
Improved	M1	11.34g	11.28g	11.29g	11.35g	11.28g	56.54g	11.31g	38.10g
	M2	4.34g	4.28g	4.27g	4.36g	4.28g	21.53g	4.31g	
Conventional	M1	12.18g	12.18g	12.18g	12.18g	12.18g	60.9g	12.18g	65.02g
	M2	7.94g	8.20g	8.20g	7.75g	7.50g	39.5g	7.92g	

Drape coefficient = $\frac{M_2}{M_1} \times \frac{100}{1}$

Conventional = $\frac{7.92g}{12.18} \times \frac{100}{1} = 65.02g$

:. Drape Coefficient = 65.02g

Improved = $\frac{4.31g}{11.31} \times \frac{100}{1} = 38.10g$

:. Drape Coefficient = 38.10g

2. **Production of improved Akwete fabric:** In this stage the researcher tried to improve on the fabric by weaving the fabric. The components of the loom was fixed by tying or knotting of the twines in a spiral or "8" shaped movement along two long, slender sticks to form the heddle on the floor loom. After this exercise, the production of experimental product took place in the following ways; the yarn was reeled on the loom and weaving took off by passing the shuttle which carried the weft thread through the shed created by pulling the heddle and subsequently beating it down, into the cloth with the beater and it was done in industrial design studio (Appendix III)

3. **Testing the improved Akwete fabric:** In this stage, the researcher took the improved Akwete cloth back to textile design and technology laboratory to determine whether it has been improved and compared it with conventional Akwete fabric using the same equipment and carrying out the same experiments as in stage one.

4. **Assessment of the finished product**

   This stage comprised of training of the respondents and evaluation of the finished products.

   a. **Training of the respondents –** The researcher presented the finished product with the score card to the respondents, explained to them how to assess the finished product (fabric) by observing and touching it, following the instructions on the score card.

   b. **Evaluation of the finished product:** The respondents following the instructions on the score card assessed the product and recorded their observations and the researcher then collected the score cards for data analysis.

3.6 Procedure for Data Analysis

The data collected were analyzed in tabular form using appropriate statistical procedures as follows:

The demographic data of lecturers were analyzed using frequencies and percentages. Answers to research questions one to four were provided through descriptive statistics (mean and standard deviation) which was used to calculate the means of the weight, coarseness, design and the mean response of lecturers interms of acceptability, of

the improved fabric with decision rule of 2.5 for acceptability, and 2.0-2.49 for unacceptability using a four point scale format. The null hypotheses one, two and three, on significant differences in weight, coarseness and the design of Akwete fabric were tested using parametric statistics (ANOVA) at 0.05 level of significance and were rejected.

Analysis of Variance (ANOVA) was used because it is a statistical instrument that is used to test data obtained from more than two groups. t-test on the other hand was used to test the difference between the acceptability level of the lecturers of the improved and conventional Akwete fabric at 0.05 level of significance and was rejected also, because the t- cal of 2.75 is more than the t-table of 1.96 with P>0.05 showing there is significant difference in the acceptability between the improved and conventional Akwete fabric. The null hypothesis is retained if the critical f-ratio is greater than the calculated value such as F-crit = 2.95 and F-cal = 0.33 and is rejected if the critical F-ratio is less than the calculated F-cal such as F-Crit=3.51 and F-cal 5.63 and in t-test the null hypothesis is retained if the t-cal is less than the t-table such as t- cal = 2.75 and t – table =1.96. While if the t-cal is greater than t-table, the null hypothesis is rejected.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

This chapter presents analysis of data under the following sub-headings:

4.1 Analysis of demographic data

4.2 Answers to research questions

4.3 Testing of hypotheses

4.4 Discussion of the findings

4.1 Analysis of the Demographic Data

Analysis of the demographic data of respondents was done in frequencies and percentages. Results were presented in table 4.1.1 - 4.1.3

4.1.1 Distribution of respondents (lecturers) by institution

S.N	Institutions	Frequency	Percentage
1	Federal University of Technology Owerri	40	20
2	Alvan Ikoku Federal College of Education Owerri	40	20
3	Federal College of Agriculture Umuagwo	40	20
4	Imo state university Owerri	40	20
5	Federal Polytechnic Nekede Owerri	40	20
	Total	200	100

The result in Table 4.1 showed that 40 lectures representing 20% were from each of the institution showing equal representation according to the sampling method used, which is multi – stage sampling technique.

Table 4.1.2 Distribution of lecturer's respondents by educational qualification

Educational qualification	Frequency	Percentage
PHD Holders	74	37
M.Sc/M.Ed	70	35
Professors	56	28
Total	200	100

Table 4.1.2 showed the distribution of respondents (lecturers) by their educational qualification, 74 lecturers representing 37% had Doctorate degree and 70 lecturers representing 35% had M.Sc./M.Ed Certificate, 56 lecturers representing 28% were Professors. Thus majority of lecturers respondents were Ph.D holders.

Table 4.1.3 Distribution of respondents (lecturers) respondents by rank

Rank	Frequency	Percentage
Lecturer I	54	27
Principal lecturer	52	26
Senior Lecturer	48	24
Chief Lecturer	46	23
Total	200	100

Table 4.1.3. showed the distribution of respondents (lecturers) by their ranks. 54 lecturers representing 27% were lecturer one, 52 lecturers representing 26% were principal lecturers, 48 lecturers representing 24% were senior lecturers and 46 lecturers representing 23% were of the rank of chief lecturers. In conclusion all the lecturers with different ranks were used as the respondents.

4.2 Answers to Research Questions

Four questions were raised to enable the researcher collect relevant information for the study. Descriptive statistics was used to answer these questions as shown in Tables 4.2.1 to 4.2.3.

Table 4.2.1 Answering Research question One

Research Question one: What is the difference between the weight of improved and conventional Akwete fabrics?

Table 4.2.1 Descriptive statistics of the mean weight difference of the improved and conventional Akwete fabric

Akwete fabric	Wt/g	Mean	Standard deviation	Standard error	Remark
Conventional	12.27g	8.5715	3.64575	.89772	Significant
Improved	4.81g	4.2500	.50000	.25000	Difference

Table 4.2.1 showed that the mean weight of conventional Akwete fabric was 8.5715 while that of the improved fabric was 4.2500 revealing that there existed the difference of 4.3215 between the two fabrics. This means that the conventional Akwete fabric had higher mean weight than the improved Akwete fabric which had less mean weight as compared to that of the conventional fabric. Therefore with the less weight of 56.6g from 144.3g, in table 3.6, the fabric is comfortable and acceptable with mean acceptability of 3.15 in table 4.2.4 for special occasion by 180 lecturers representing 90 in higher institutions in Imo state, Nigeria, while 4 lecturers representing 10% rejected the fabric due to personal dislikeness.

Table 4.2.2: Answering Research Question Two

Research Question Two: What is the different between the coarseness of improved and conventional Akwete fabric?

Table 4.2.2a Descriptive statistics of mean air permeability test on coarseness (texture) of improved and conventional Akwete fabric

Akwete fabric	Rate/cm^3/ second	Mean	Standard deviation	Standard error	Remark
Improved	16.4cm^3	92.25	19.676	5.415	Significant
Conventional	24.3cm^3	72.24	5.999	1.229	Difference

Table 4.2.2a showed that the improved fabric had a higher mean air permeability of 92.25 while the conventional had lower mean air permeability of 72.24 indicating its uncomfortability to the skin due to its coarse texture. The improved fabric exhibiting a higher mean air permeability indicated that the texture of the fabric is soft and smooth.

Table 4.2.2b Descriptive statistics of the mean drapability coefficient of both the improved and the conventional Akwete fabric

Fabric sample	Drape coefficient	Mean	Standard deviation	Standard error	Remark
Improved	38.10g	1.32g	.346	.039	Significant
Conventional	65.02g	3.03g	.692	.079	Difference

Table 4.2.2b showed that improved fabric had mean drape coefficience of 1.32g while the conventional had a mean coefficience of 3.03g and their difference as 1.71g. The conventional having a high mean coefficience indicated that the fabric did not drape well therefore it showed coarse texture, with heavy weight and difficulty in air flow through it, thus it became uncomfortable for the wearer. The improved fabric showing low mean coefficient meant that it was light in weight, had smooth texture and permitted air freely through it, therefore the fabric draped well which indicated it showed quality for comfortability that led to its acceptability. This drapability of the fabric concluded the answer to research question two.

4.2.3 Answering of Research Question Three

Research Question Three: What is the difference between the design of the improved and conventional Akwete fabric?

Table 4.2.3 Descriptive statistics of the mean difference in design of the improved and conventional Akwete fabric

Akwete fabric	Total score	Mean	Standard deviation	Standard error
Improved	60	7.3137	.6846	.06417
Conventional	38	3.8231	.8142	.2834

Table 4.2.3 showed that the improved fabric had a high mean score of 7.2137 in its design while the conventional fabric had a low mean score of 3.8231, their mean difference of 3.4906, and with a high mean score, it means the design of the improved fabric was better. Thus majority of the lecturers preferred and accepted it because of the improvement for their special occasions.

Table 4.2.4 Answering Research Question Four

Research Question Four: What is the extent of acceptability of the improved fabric for special occasions by female lecturers of the tertiary institutions in Imo State?

Table 4.2.4: Acceptability table of improved Akwete Fabric for Special Occasion by female lecturers in tertiary institutions.

Institutions	No of lecturers	Acceptable	Percentage	Unacceptable	Percentage unacceptable	Mean acceptability of female lecturers							
						Variables	N_1 $\overline{x}_1$	N_2 $\overline{x}_2$	N_3 $\overline{x}_3$	N_4 $\overline{x}_4$	N_5 $\overline{x}_5$	$\overline{x}_g$	Remark
FUTO	40	40	20	00	00		3.40	4.00	4.00	3.40	3.70	3.70	Acceptable
AICE	40	40	20	00	00	Weight	3.00	3.80	4.00	3.40	3.70	3.70	Acceptable
FECAU	40	35	17.5	10.0	5.0	Texture	3.60	3.80	3.00	4.00	3.85	3.65	Acceptable
IMOSU	40	35	17.5	5.0	2.5	Appearance	2.80	2.80	3.20	3.80	3.15	3.15	Acceptable
Poly Neked	40	30	15	5.0	2.5	Acceptability	2.80	2.80	3.20	3.80	3.15	3.15	Acceptable
Total	200	180	90%	20.0	10%								

Keys:

N_1 = Number of female lecturers in Federal University of Technology Owerri.

N_2 = Number of female lecturers in Alvan Ikoku College of Education Owerri.

N_3 = Number of female lecturers in Federal College of Agriculture Umuagwo Owerri

N_4 = Number of female lecturers in Imo state University Owerri.

N_5 = Number of female lecturers in Federal Polytechnic Nekede Owerri.

x_1 = Mean acceptability of female lecturers in Federal University of Technology Owerri.

x_2 = Mean acceptability of female lecturers in Alvan Ikoku College of Education Owerri.

x_3 = Mean acceptability of female lecturers in Federal College of Agriculture Umuagwo Owerri

x_4 = Mean acceptability of female lecturers in Imo state University Owerri.

x_5 = Mean acceptability of female lecturers in Federal Polytechnic Nekede Owerri.

Table 4.2.4 shows that grand mean scores of the items were above 2.50 which is the minimum cut of point, an item would score in order to be acceptable and any score below this is not acceptable. Therefore it infers that all the variables responsible for the fabric's rejection have been improved so it is acceptable. This also implies that 180 lecturers (90%) out of 200 lecturers accepted the improved fabric in all its variables with the average acceptability of 3.15, which was highly acceptable as in a four point scale and 10(10.3%) rejected the fabric because of personal dislikeness of hand woven fabric.

4.3 Testing of Hypotheses

Three null hypotheses were postulated to give statistical validation to the solutions obtained in the research questions. Analysis of variance (ANOVA) and Mann Whitney U-test were used to test the hypotheses. The results were presented in 4.3.1 – 4.3.3.

H_{01a}: There is no significant difference between the weight of improved conventional Akwete fabric

Table 4.3.1 Analysis of variance (ANOVA) statistics on the weight of improved and conventional Akwete fabric

Variations	Summary	Df	Ms	F cal	F crit	Prob. Level
SSb	20.9	2	10.5	5.25	3.89	0.05
SSw	24	12	2			
SSt	44.9	14	3.21			

The result of the analysis of variance on weight of Akwete fabrics according to the female lecturers of five higher institutions in Imo state, is significantly different. This is because the calculated value (Fcal) of 5.25 is higher than the table value (Fcrit) of 3.89 at 0.05 level of significance. Therefore the null hypothesis which stated that there is no significant difference between the conventional and improved akwete fabric in weight

was rejected. This therefore implied that the weight of the conventional fabric was higher than that of the improved fabric.

H_{02}: There is no significant difference between the coarseness of improved and conventional akwete fabric..

Table 4.3.2 Analysis of variance statistics on coarseness of improved and conventional akwete fabric.

Summary	**SS**	**Df**	**Ms**	**Fcal**	**Fcrit**	**Prob. Level**
SSb	54.8	2	27.4	4.57	3.89	0.05
SSw	72.2	12	6.0			
SSt	68.2	14	4.87			

The analysis of variance in table 4.3.2 revealed that there is significant difference in the texture shown as coarseness of both improved and conventional akwete fabric therefore the null hypothesis which stated that there is no significant difference between the coarseness of improved and conventional akwete fabric is rejected. The reason is that the calculated value of 4.57 is greater than the table value (Fcrit) of 3.89.

H_{03}: There is no significant difference between the design of improved and conventional akwete fabric.

Table 4.3.3 Analysis of variance statistics on design of improved and conventional akwete fabric.

Summary	SS	Df	Ms	Fcal	Fcrit	Prob. Level
SSb	-26	2	-13	4.64	3.89	0.05
SSw	-34.4	12	-2.8			
SSt	-30.4	14	-2.17			

The analysis of variance in table 4.3.3 on design of improved and conventional Akwete fabric is significantly different because the calculated value (Fcal) of 4.64 is higher than the table value of (Fcrit) of 3.89. Thus the null hypothesis which stated that there is no significant different between the design of improved and conventional Akwete fabric is rejected. This showed that there was improvement indeed on the fabric.

H_{04}: There is no significant difference between the female lectuers' acceptability of the improved and conventional akwete fabric for special occasion in tertiary institution in Imo state.

Table 4.3.4 Mean Rating and t-test analysis of female lecturers' acceptability difference between and improved and conventional akwete fabric in tertiary institutions in Imo state.

	N1=40	**N2=40**	**N3= 40**	**N4= 40**	**N5= 40**					
	$\bar{x}_1$	$\bar{x}_2$	$\bar{x}_3$	$\bar{x}_4$	$\bar{x}_5$	$\bar{x}_g$	**SD**	**t-cal**	**Remark**	**HO**
Improved	3.83	3.80	3.90	3.85	3.94	2.86	2.86	2.75	Accepted	Significant
Conventional	1.70	1.30	1.15	2.0	1.40	1.39	0.16	0.40	Not accepted	Difference

Keys:

N_1 = Number of female lecturers in Federal University of Technology Owerri.

N_2 = Number of female lecturers in Alvan Ikoku College of Education Owerri.

N_3 = Number of female lecturers in Federal College of Agriculture Umuagwo Owerri

N_4 = Number of female lecturers in Imo state University Owerri.

N_5 = Number of female lecturers in Federal Polytechnic Nekede Owerri.

$\bar{x}_1$ = Mean acceptability of female lecturers in Federal University of Technology Owerri.

$\bar{x}_2$ = Mean acceptability of female lecturers in Alvan Ikoku College of Education Owerri.

$\bar{x}_3$ = Mean acceptability of female lecturers in Federal College of Agriculture Umuagwo Owerri

$\bar{x}_4$ = Mean acceptability of female lecturers in Imo state University Owerri.

$\bar{x}_5$ = Mean acceptability of female lecturers in Federal Polytechnic Nekede Owerri.

$\bar{x}_g$ = Grand mean

Df = 298

t-table = 1.96

Table 4.3.4 revealed that the mean values for acceptability of both fabrics fall between 1.30 and 3.85. the conventional fabric scoring 1.30 mean value is below acceptability point of 2.50 in a four point scale indicates that the fabric is not acceptable for special

occasion while the improved fabric scoring 3.85 is higher than the acceptable point of 2.50 indicates that it is acceptable by the female lecturers for special occasion. The table also revealed that the t-cal of 2.75 for improved fabric which is greater than the table value of 1.96 indicates significant difference. The t-cal of improved fabric being greater than the t-cal of the conventional fabric also shows significant difference therefore, the null hypothesis is rejected because the improved fabric is accepted. In t-test any item that score below t-table value of 1.96 indicates there is no significant difference therefore it is retained but if the t-cal is higher there is significant difference, therefore the null hypothesis, which states that there is no significant difference between the acceptability of improved and conventional akwete fabric is rejected because the t-cal of 2.75 is greater than the t-table of 1.96.

4.4 Major findings

The major findings of the research revealed the following:

1. That 1,728 plies of yarns were found in one centimeter square of conventional Akwete fabric coupled with the basket weave used in producing it escalated the weight and compactness that led to its coarse texture causing difficulty in the air flow to the body therefore people feel uncomfortable in it when worn.
2. The improved fabric was still heavy after reducing the yarn count to 280 plies of yarns per one centimeter square and using treated cotton yarn, so the female lecturers still rejected it, for its weight but partially accepted it, for its design. This led to swapping to rayon yarn which is of synthetic fibre and the weight and compactness reduced making the texture smooth and comfortable that the female lecturers accepted the fabric.

3. The obsolete design of animals like lizard, tortoise and the likes was replaced with embroidery pattern and floral applique in the improved fabric. This made the fabric attractive and beautiful that female lecturers accepted it for their special occasions.
4. The grand mean acceptability of 3.94 for improved akwete fabric which is higher than the cut-off point of 2.50 in a four point scale for acceptability is greater than the grand mean acceptability of 1.39 for conventional akwete that is below the cut-off point indicated that the improved akwete fabric was highly acceptable for special occasion by 180 out of 200 female lecturers in tertiary institutions in Imo State Nigeria.

4.4.1 Discussion of the Findings

Research question one and the null hypothesis one as shown in tables 4.2.1 and 4.3.1 revealed that significant difference exist between the weight of improved and the conventional akwete fabric. The number of plies in a yarn (yarn count) was reduced during the weaving of improved fabric therefore the weight reduced as in Table 4.2.1. In addition rayon yarn known as industrial yarn which was light in weight was later used, after discovering that the new product from treated cotton yarn was still heavy, and it affected the weight drop. This finding is in line with Dauda (2003) and Nkeonye (2009) who observed that the processing of yarn is governed by the twist and the count which is the total number of warp and weft per square centimeter of a woven fabric. This yarn count denotes about the quality, durability and wear life of a fabric. Therefore if there is increase in yarn count, it makes fabric heavy and reduction in yarn count makes the fabric light in weight.

The findings of research question two and null hypothesis two as shown in tables 4.2.2a and 4.2.2b revealed a significant difference between the texture of improved and conventional akwete fabric, as was observed during the laboratory experiments on drapability test, thermal heat test and air permeability test, plus their mean differences of 20.01 in table 4.2.2a and 1.71g in table 4.2.2b. The findings confirmed what Kucha (1989) observed in her own experiment, that the air permeability of conventional akwete was so low, that its high resistance to air flow recommends it as a suitable apparel for cold weather. However as soon as improvement was done on it, the reverse was the case, that is, it became convenient for special occasions. Again the findings were also in line with Taylor, 2000 in Dauda 2003's report which stated that compact fabrics which have high resistance to distortion will have poor drape quality. Thus heavy fabrics from coarse yarns and construction have poor drape characteristics, while light fabrics from yarns of smooth texture have good drape and handle. Also the findings on thermal heat test recommended the improved akwete fabric as special occasion wear thus confirming the texture to be smooth to the skin, due to its ability to lose heat to the atmosphere, keeping the body cool.

The findings on research question three and null hypothesis three on design are also relevant to Davis (1992)'s view fashion theory who advocates that innovations and modifications radiate outward and is in conformity with product innovation theory from opinion of Delong (1998) who stated that fashion is pursuing novelty for its own sake and requires innovative new look for diffusion of innovation or for it to permeate a given society. Therefore having improved on the design of akwete fabric, new fashion emerged attracting the interest of the female lecturers to accept the fabric for their special

occasions. This showed that improved akwete fabric is significantly different in design as shown in table 4.2.3 the mean difference in design of 3.4906. This is line with Gilligan (2010) who admitted that when designs are created by selection of special yarns or colour, it has effect on the texture and appearance of the woven fabric and this inturn makes way for its acceptability and usage.

The findings on research question four and null hypothesis four showed significant difference in acceptability between the improved and conventional fabrics with grand mean of 3.94 and 1.39 respectively. The improved fabric scoring 3.94 grand mean was higher than the cut – off point of 2.50 for acceptability was highly acceptable by 180 out of 200 female lecturers in tertiary institution while the conventional scoring 1.39 below cut – off point of acceptability was highly rejected by female lecturers for special occasion in tertiary institutions in Imo state Nigeria.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents summary, conclusion and recommendations of the study based on results of the findings and was presented under the following sub-headings:

5.1 Summary

5.2 Conclusion

5.3 Recommendations

5.4 Suggestion for further studies

5.1 Summary

The study was carried out to determine the acceptability of improved Akwete fabric for special occasion for female lecturers in tertiary institutions in Imo state, Nigeria. Three specific objectives were stated for the study. Three research questions and three null hypotheses were raised to enable the researcher collect relevant information for the study.

The review of related highlighted that yarn type and the count affect woven fabric in its weight, texture, drapability air permeability rate, thermal heat rate and comfortability. It also revealed that conventional akwete lacked the good fabric properties such as light weight, smooth texture, high air permeability rate, good drapability, faster heat loss, therefore it seems not to be comfortable to the wearer so it is being rejected for special outing wears by many women.

Experimental design was adopted for the study. The population for the study was 2000 female lecturers from five tertiary institution in Imo state and a sample of 200 female lecturers which is one tenth of the population as used for the experiment.

The major findings of the study revealed that:

- Increase in yarn count of a fabric, the type of yarn and the type of weave used in producing the fabric affected the weight, coarseness and comfortability of the fabric; to the wearer.
- Improved Akwete fabric being made of plain weave became lighter in weight and smoother in texture because of reduction in yarn count from 1,728 plies to four plies of yarns per one centimeter square and using rayon yarn for the weaving.
- The design of the improved Akwete fabric being made of floral appliqué and embroidery patterns made the fabric, more attractive in appearance.
- The improved fabric was acceptable by 180 out of 200 female lecturers with grand mean acceptability of 3.94 above cut – off point of 2.50. Thus majority of the lecturers in those institution accepted the fabric.

5.2 Conclusion

In view of the findings in this study, the researcher drew the conclusion that reduction in yarn count, using plain weave and rayon yarns during the process of weaving made the improved Akwete fabric lighter in weight, with smoother texture, thus it became comfortable to the skin. Furthermore, introducing new designs of embroidery patterns and floral appliqués improved the design of the fabric from old designs made of animals, therefore it became attractive and more acceptable by 180 out of 200 female

lecturers with grand mean acceptability of 3.94 above cut-off point of 2.50 was considered highly acceptable.

5.3 Recommendations

Based on the findings of the study, the following recommendations were made:

- When producing Akwete fabric it is best to use industrial yarns (rayon yarns) instead of pure cotton yarns and the yarn counts should be reduced to two plies in a yarn instead of multiple plies found in a yarn of conventional fabric to avoid heavy weight.
- The pattern of the weave should be plain and not basket weave, so as to reduce its coarse texture making it comfortable to the skin.
- Designs and patterns to be made on the fabric should be made of embroidery patterns and floral appliqués for it to be attractive and acceptable by female lecturers.

5.4 Suggestion for Further Studies

- There is need for further studies on use of improved Akwete fabric for constructing special occasion garment for female students in tertiary institutions.
- Using improve Akwete fabric for constructing special occasion garment for female lecturers not only as apparel.
- There is also need for further studies on using only synthetic fibres to weave Akwete fabric and compare its acceptability with the one made of mercerized cotton fibre.

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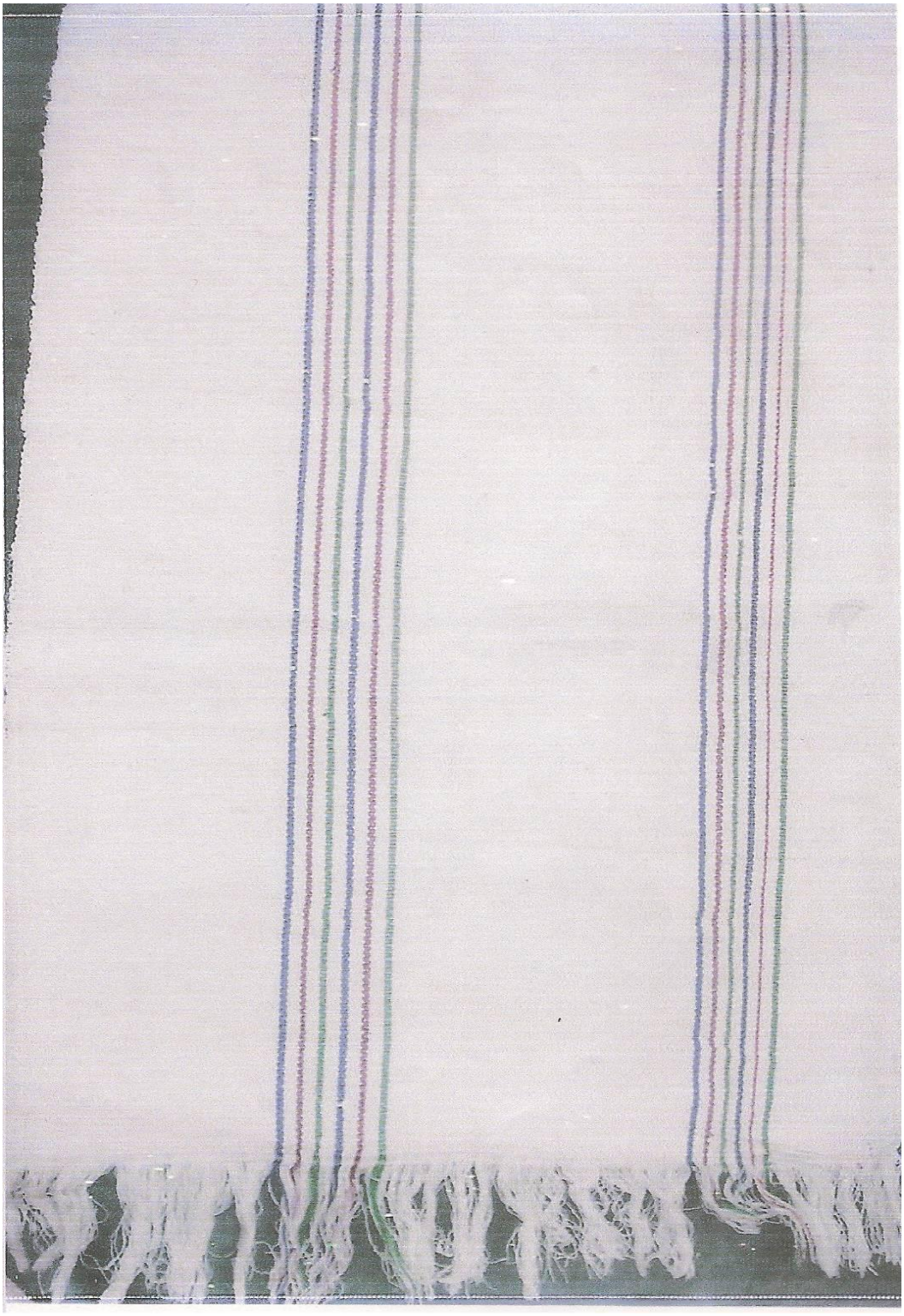
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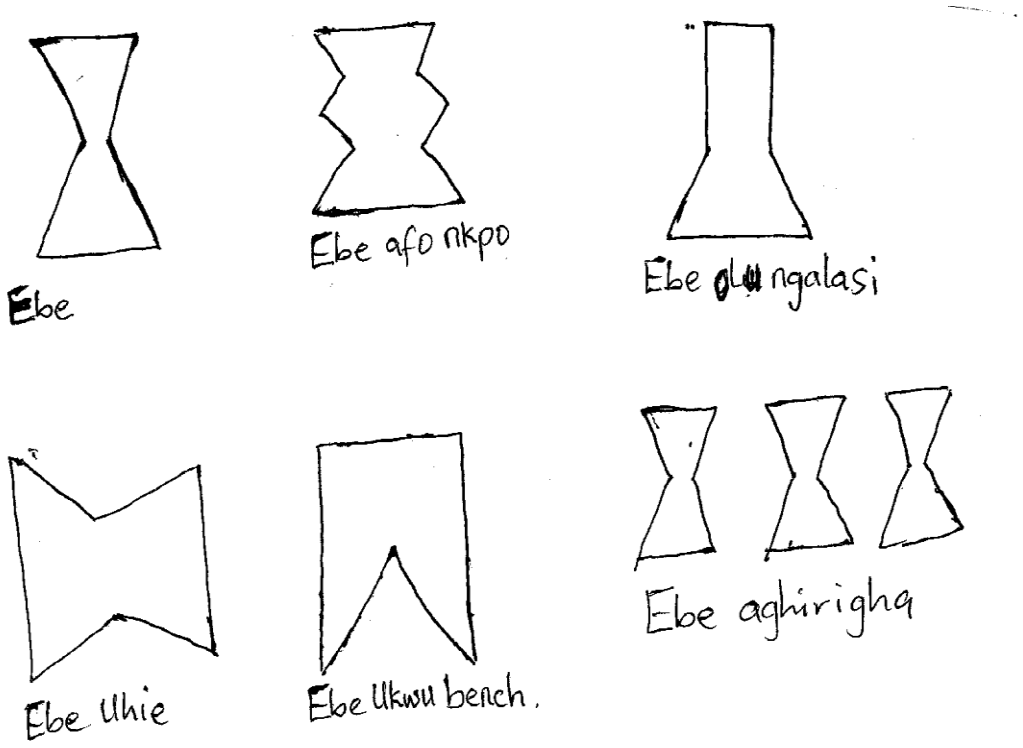
APPENDIX I

CONVENTIONAL AKWETE FABRIC



APPENDIX II

Indigenous pattern in 'Akwete Ebe and Ekaki'





Bird



Tortoise

APPENDIX III

Pictures of improved Akwete fabric with simple design in production process



The Researcher Weaving the Akwete fabric



The production process of the Akwete fabric



The finished Akwete fabric

APPENDIX IV



Yarn specification and yarn counting

APPENDIX V



Thermal Heat Experiment on Improved Akwete Fabric



Thermal Heat Experiment on Conventional Akwete Fabric

APPENDIX VI



Air permeability experiment on conventional Akwete fabric



Air permeability experiment on improve Akwete fabric

APPENDIX VII

Equipment



Weaving loom



Drape tester



Drape meter



Air permeability tester

APPENDIX VIII

DEPARTMENT OF VOCATIONAL & TECHNICAL EDUCATION

AHMADU BELLO UNIVERSITY, ZARIA NIGERIA

FACULTY OF EDUCATION

Telephone: 069-51755, 50692
Vice Chancellor: Professor. Abdullahi Mustapha B.Sc. (Hons) Pharm(ABU), Ph.D (London) FPSN
Head of Department: Dr. I. M Haruna PGDE, (ABU), MSc (Bulgaria)

*Your Ref:*_____

Our Ref: M.ED/EDUC/15079/2007-08

Date: 5th June, 2013

Letter of Identification

HOPE OGECHUKWU – M.ED/EDUC/15079/2007-2008

This is to certify that the above mentioned name is a Postgraduate student (M.Ed Home Economics) in the Department of Vocational and Technical Education, Ahmadu Bello University, Zaria, carrying out a research topic: **Acceptability of Improved Akwete Fabric for special Occasion For Female Lecturers in Tertiary Institutions in Imo State Nigeria.**

Please, kindly give her every assistance she may require.

DEPT. OF VOC. & TECH. EDUCATION
HEAD OF DEPT.
DATE
A.B.U. ZARIA

Dr. I. M. Haruna
HEAD OF DEPARTMENT

APPENDIX IX

Home Economics Section,
Department of Vocational and
Tech. Education,
Faculty of Education,
Ahmadu Bello University, Zaria.

Dear Respondent,

REQUEST TO FILL THE SCORE CARD

I am a student of the above mentioned school conducting a research on "Acceptability of improved akwete fabric for special occasion for female lecturers in tertiary institutions in Imo state Nigeria.

Your cooperation and honest response will be a valuable contribution to the findings and result of this research work. All information provided will be treated confidentially and will be used for academic purpose only.

Thanks for your cooperation.

Yours faithfully,

Hope O. Anucha.

PART A: DEMOGRAPHIC DATA

Instruction: Please indicate what is appropriate in the available space provided for the following.

Personal Data

1. Name of the institution_____
2. Department _____
3. Educational Qualification_____
    a. Masters [ ]
    b. P.Hd. [ ]
    c. Professor [ ]
4. Present Rank
    a. Assistant lecturer [ ]
    b. Senior lecturer [ ]
    c. Principal [ ]
    d. Chief lecturer [ ]

PART B: ASSESSMENT OF THE FINISHED PRODUCTS

Instruction: Before you are two samples of finished product, please handle, evaluate and record your observations in the score card using the scoring keys with the corresponding numbers, to represent your observations.

Table 3.3 Score card

	P1				**P2**			
Variables	1	2	3	4	1	2	3	4
Weight								
Texture								
Appearance								
Acceptability								

P1 = Conventional Akwete
P2 = Improved Akwete

Scoring keys

Appearance	
Highly attractive	4
Attractive	3
Fairly attractive	2
Not attractive	1

Texture	
Very smooth	4
Smooth	3
Slightly coarse	2
Coarse	1

Weight	
Very light	4
Light	3
Heavy	2
Very heavy	1

Acceptability	
Highly acceptable	4
Acceptable	3
Not acceptable	2
Highly unacceptable	1

APPENDIX X

CONCEPTUAL FRAMEWORK

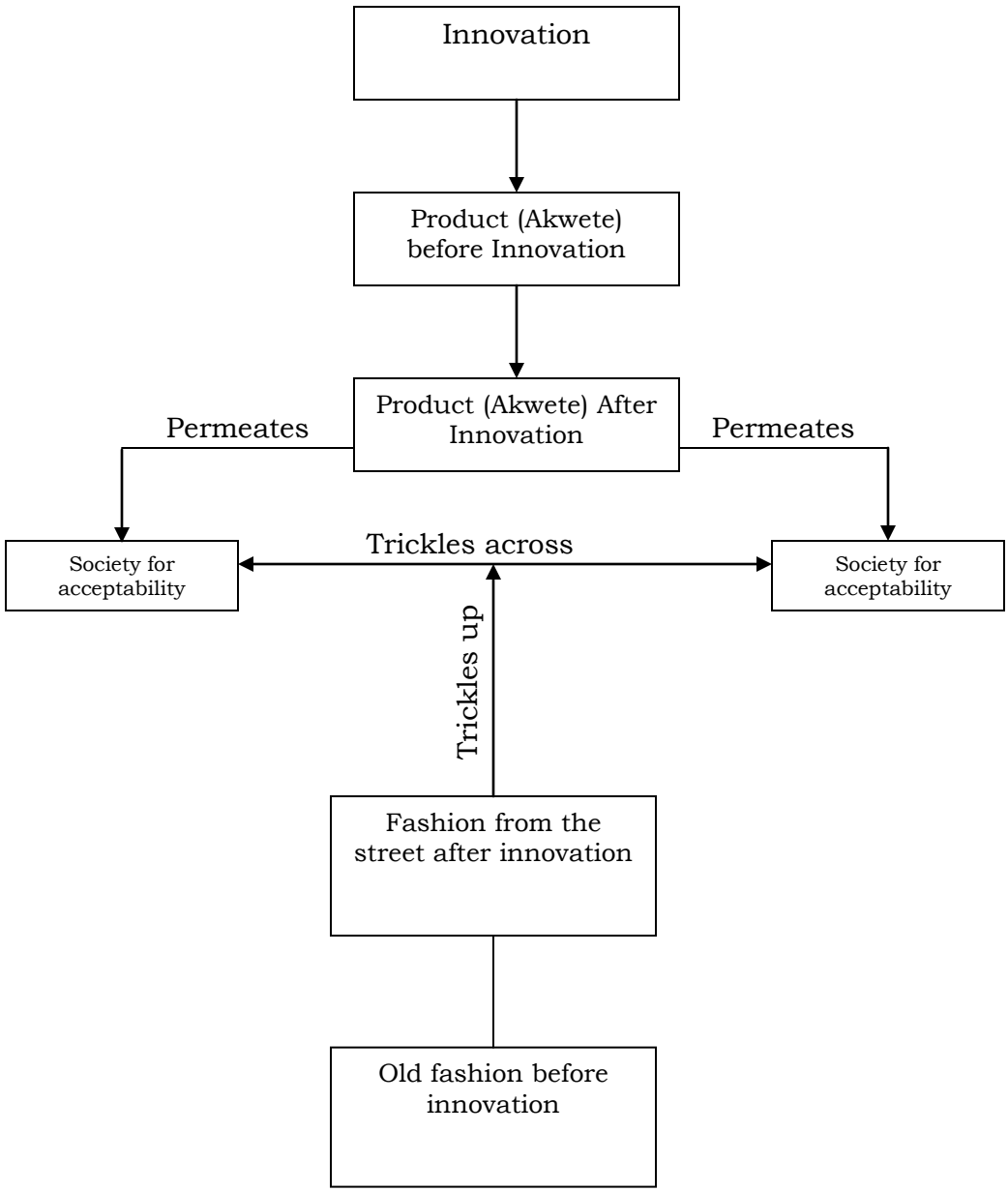


Fig. 1: Innovation of Akwete Fabric for Acceptability for Special Occasion.