UNIVERSITY OF EDUCATION, WINNEBA

COLLEGE OF TECHNOLOGY EDUCATION, KUMASI

COMPARATIVE STUDY OF FREE-HAND CUTTING AND PATTERNS IN THE GARMENT INDUSTRY

MAWUFEMOR BANS-AKUTEY

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MAWUFEMOR BANS-AKUTEY

(200027654)

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

MAY, 2021

DECLARATION

STUDENT'S DECLARATION

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

SIGNATURE: ……..

DATE: ……

SUPERVISOR'S DECLARATION

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

NAME OF SUPERVISOR: DR. JOSEPHINE ABOAGYEWAA-NTIRI

SIGNATURE: …….....

DATE: ….....

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DEDICATION

I dedicate this thesis to my lovely husband Mr. Isaac Yaw Deh and my daughter Emmanuella Mawuena Afua Deh.

TABLE OF CONTENT

Content **Page**

LIST OF TABLES

Table **Page**

LIST OF PLATES

Plate **Page**

ABSTRACT

Garments are constructed by using free-hand cutting or pattern. Clients now demand better products as they have difficulties with the fit of garment made by their informal dressmakers and tailors. This study aimed at evaluating the effect of free-hand cutting and the use of pattern on perfect fit of garment. Mixed method approach was adopted. A cross-sectional descriptive survey was used for this study. The total target population was 1377 which included registered road side dressmakers and tailors, fashion designers and fashion students of public tertiary institutions at Kwadaso Municipality, Sunyani East Municipality and Asafo area in the Kumasi Metropolis of Ghana. A sample size of 302 respondents was selected using multi-stage sampling technique. Questionnaire, focus group interview, and observation were used to gather information from the respondents. The study found that with free-hand cutting method, garment look elegant on the body, brings out the good style in garment, and provides special features to garment. The finding also showed that garment made with pattern brings out the original style, promotes variations of styles, and fits well on the body. The results showed that garment made with pattern fits better as compared to free-hand cutting. Based on this it was concluded that garment constructed with both free-hand cutting and patterns brings out the perfect fit of garment with patterns slightly on top. It was recommended that Ghana National Tailors and Dressmakers Association (GNTDA) should encourage and train their members on the use of pattern and this would improve and manifest in the high standard on fit of garment among the dressmakers and tailors in the informal setting in the near future. Also, the informal dressmakers and tailors should training of their apprentices to develop interest in the use of both free-hand cutting and pattern right from the onset.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Garment production involves an interest in manufacturing clothing or establishing a clothing factory which certainly involves skilled personnel in areas of designing, pattern, sewing, trimming, embroidery, and textile print (Anikweze, 2012). Garments are of great importance to all human beings. Consequently, textile and garment industries keep on growing as the human population increases and are currently among the largest and fastest growing industry, which have become economic force to reckon with (Forster & Ampong, 2012). Garment for men and women are made from materials including fabrics. These can be achieved through the use of patterns or the use of free-hand cutting. According to Obinnim and Pongo (2015), free-hand cutting and pattern remain the bedrock of ways of designing garment in the fashion industry which come with variances of fit and modifications of style. The use of free-hand cutting to make garment is an initial step in garment making. Also, free-hand cutting is a method of cutting a style of a garment directly on the fabric without the use of a pattern.

Free-hand cutting of garments started from the bolt of cloth in G. B. Moroni's painting *The Tailor* (c. 1570), the fashionably dressed artisan prepares to use his shears on a length of cloth marked with tailor's chalk (Alison, 2012). Later manuals, such as the important *L'Art du Tailleur* by de Garsault (1769) have more detailed instructions as to measurement, cutting, fit, and construction using freehand cutting. Shailong and Igbo (2009), described free-hand cutting as a method of cutting the fabric marked with chalk based on the measurement and cut directly without the use

of a paper pattern. However, the measurement of the individual is utilised directly on the fabric in free- hand cutting. The fabric may be wasted when using the free- hand cutting as it is common to make a mistake. According to Iloeje (1995), as cited by Shailong and Igbo (2009), free-hand method of garment construction may spoil the garment entirely, thereby wasting the fabric. Shailong and Igbo (2009), further revealed that free-hand cutting is time consuming and slow, therefore cannot be conveniently used for mass production. Efajemue and Lilly (2017) also indicated that free-hand cutting has resulted to unfitted garments and quarrels among dressmakers and their clients.

The use of patterns is an initial stage in garment making. It is a craft that has evolved over centuries into a skilled technical process. The first known clothing patterns appeared in Spain – Juaan de Alcega's *Libro de Geometric Practica y Traca* in 1589, and La Rocha Burguen's *Geometrica y Traca* in 1618. During these years, Spanish fashions dominated European dress – and these books gave specifics on making garments for men, women, clergy, and knights (Alabama Chanin, 2016). Pattern making is the art of designing the outline of the plan or arrangement for sewing a cloth (Anderson, 2011). Today, patterns have been designed to quickly perform repetitive time-consuming tasks, which have allowed garment manufacturing companies to keep pace with the fast-moving world of fashions (Tamakloe, 2011). Thomas (2009) posited that the first step in pattern making is taking of body measurements. Thomas recommended that when taking measurements for pattern making, the person should just wear normal underclothes, and if a lady, normal pantyhose and normal bra. Steele (2008) noted that a system of sizes and patterns made it possible to fit the body, especially the male body, without resorting to custom-made clothing. Aldrich (2014:12) also indicated that patterns are needed in

dress-making in order "to obtain a better fit and to save material". Aldrich further justifies the use of block patterns in the clothing industry because the blocks are constructed to standard (average) measurements for specific groups of people but could also be drafted to fit an individual figure using personal measurements.

A pattern is achieved through the use of actual measurements of the person concerned and this results in a piece of paper drafted and cut to shape and subsequently used for sewing garment (Ekumankama & Igbo, 2009). Seemingly, the informal dressmakers and tailors in Ghana do not put much emphasis on measurements and steps taken in measurements which leads to poor garment fit. Free-hand cutting does not employ patterns and it is achieved by coming out with a style of the garment cutting directly on the fabric (Shailong & Igbo, 2009). The option of free-hand cutting or pattern method to make garment may affect the end product. Previous studies have ascertained that clients are more particular about how well garment fits (Dove, 2016; Shailong & Igbo, 2009). The problem is that, particular technique, either the pattern or the free-hand cutting is more suited to a specific garment fit and clients' requirements, yet, most of dressmakers and tailors in informal dressmaking industry seem not well versed in both techniques (Efajemue & Lily, 2011).

The use of free-hand cutting does not involve much precision, science and formal education therefore; informal dressmakers and tailors in Ghana seem to be comfortable with it (Obinnim & Pongo, 2015). Many dressmakers acquire and use the skills of sewing as hobbies or part-time jobs to enhance their income. Many of them are very busy and do not find the time or bearing of schooling to gain more in-depth knowledge to be more skillful (Gizeski, 2009). It has been observed that most informal dressmakers and tailors prefer to use free-hand cutting while sewing because it is a faster way of making garment without minding its fit (Efajemue & Lily, 2011).

Efajemue and Lily further revealed that clothes made from pattern are made to fit well and done to the wearer's choice and exact size. While free-hand cutting method is less time consuming and stress-free to learn, it does not give the best results in terms of garment fit and style modification. However, pattern which consumes more time consequently brings out better garment fit, gives modification of styles and serves clients better.

As per Foster and Ampong (2012), most informal dressmakers and tailors are not aware of the inaccuracy of garment sewn with the free-hand method. As a result, the informal dressmakers and tailors prefer free-hand cutting to pattern making which seems faster to them, whiles the formal dressmakers prefer the use of pattern which does not pose a lot of problems in terms of fit for their clients when the garment is made. The method of garment construction has great influence on the outcome of garment fit, since each technique is suited to a particular fit, style and modification. The dressmakers and tailors need to familiarise with both of the techniques to enable utilisation of a technique where it is best suited. This has thus necessitated to compare free-hand cutting and pattern in garment industry.

1.2 Statement of the Problem

Clothing construction on the Ghanaian market is mainly free-hand cutting based but pattern making becomes necessary when the design is complicated and using free-hand cutting will not provide the desired fit (Foster & Ampong, 2012). Secondly, very little of real free-hand cutting is taught in fashion institutions and lecturers normally teach the theory and leave the practical aspects for students to explore (Foster & Adamtey, 2009). Free-hand method of garment construction may spoil the garment entirely, thereby wasting the fabric. Free-hand cutting has resulted

in unfitted garments and quarrels among dressmakers and their clients. A lot of people prefer ready-to-wear clothes due to poor garment construction from some tailors and dressmakers that use free-hand cutting. Clients now demand better products as they have difficulties with the fit of garment made by their informal dressmakers and tailors (Dove, 2016).

Numerous studies (Obinnim & Pongo, 2015; Foster & Ampong, 2012; Foster & Adamtey, 2009) have been conducted on free-hand cutting and pattern in garment production industry. It has been discovered that the use of free-hand cutting and the use of patterns by most dressmakers have posed a lot of problems. The level of dissatisfaction with fit and style modification of garment by clients of informal dressmakers, tailors and apprentices has increased. While garment made by free-hand cutting will not automatically fit well and sometimes fabrics are wasted, clients end up rejecting the end product. This situation usually leads to negative cost implications. Pattern still remains a challenge in the informal sector and that misunderstanding and difficulty of patterns and technical requirement discourage learners. These current studies failed ascertain the effectiveness of using both free-hand cutting and patterns. Using free-hand cutting will not provide the desired fit while pattern is difficult, therefore, this study filled the gap by comparing the use of both free-hand cutting and pattern to produce a garment that fits.

1.3 Purpose of the Study

The purpose of the study is to compare free-hand cutting and pattern in the construction of garment on perfect fit in Ghana.

1.4 Specific Objective of the Study

The study aimed at achieving the following specific objectives:

1. To determine the effect of free-hand cutting on finished garment
2. To evaluate the effect of the use of patterns on finished garment.
3. To evaluate the effect of fitting of free-hand cutting and patterns on finished garment.
4. To determine the effective use of both free-hand cutting and patterns in garment construction.

1.5 Research Questions

The study addresses the following research questions:

1. What is the effect of free-hand cutting on finished garment?
2. What is the effect of the use of patterns on finished garment?
3. How has the fitting of free-hand cutting and patterns affected finished garment?
4. How can the effective use of both free-hand cutting and patterns in garment construction be achieved?

1.6 Hypotheses

The following null hypotheses were tested

$H0_1$: Free-hand cutting has no significant effect on finished garments.

$H0_2$: Pattern making has no significant effect on finished garments.

$H0_3$: Free-hand cutting has no significant effect on fitting of finished garment.

$H0_4$: Pattern making has no significant effect on fitting of finished garment.

1.7 Significance of the Study

The findings of the study are expected to contribute to the existing literature on free-hand cutting and patterns in the realm of higher education. It may also help researchers in the field of fashion to appreciate pattern and free-hand cutting as basis for further research work.

Insight into free-hand cutting and pattern may help fashion designers and dressmakers to use the integrated method of free-hand cutting and pattern in garment production. It may help local dressmakers, professional designers and fashion students to be competent and can operate in every sector of garment production. This may also assist designers not to stick to one technique. It may provide relevant knowledge to equip the dressmakers and tailors on the available sewing techniques and their influence on the garment construction.

Policy makers may be guided by the knowledge in their decision in dealing with fashion designers and their activities for the betterment of mother Ghana.

1.8 Limitation of the Study

The study was not without constraints even though the researcher tried as much as possible to reduce these constraints to the barest minimum and make sure they do not affect the findings of the study. The study was restricted to dressmakers/tailors, fashion designers and fashion students at Kwadaso Municipality, Sunyani East and Asafo area where Kumasi Technical University is situated because of COVID-19 pandemic. In addition, a common constraint of using the questionnaire method for data collection is difficult in getting respondents to respond promptly to the questionnaire. Due to the COVID-19 pandemic, it necessitates that the questionnaire should be left with the respondents to make time to answer them after

which they will be collected later. This situation therefore makes it difficult for the researcher to ensure that there was no consultation among the respondents during the process of answering the questions.

1.9 Delimitation of the Study

The study is confined to issues related to comparing free-hand cutting and patterns in garment production. The study focused on dressmakers/tailors, fashion designers and fashion students in Kwadaso Municipality (University of Education, Winneba), Sunyani East Municipality (Sunyani Technical University) and Asafo (Kumasi Technical University).

In terms of content, the study specifically relates to the extent to which fashion designers use pattern and free-hand cutting method in producing garment, the differences between the fitting of garment made with adapted patterns and free-hand cutting, the effect of integrating pattern and free-hand cutting methods in garment production. The study is concerned with only registered members of dressmakers, tailors, fashion designers and fashion students.

1.10 Definition of Terms

Free-hand Cutting: Involve cutting a style direct on a fabric without the use of paper patterns.

Pattern: Is the template from which the parts of a garment are traced onto fabric before being cut out and assembled.

Dressmaker: Is a person who makes custom clothing for women, such as dresses, blouses, and gowns.

Tailor: Is a person who makes, repairs, or alters clothing professionally, especially suits and men's clothing.

Fashion designer: Is a person who apply design, aesthetics, and creates garment from nothing.

Fit: Is how well a garment conforms to the body that is not too big or too small.

Garment: Is a piece of clothing worn on the body.

Ready-to-wear clothes: They are garments made in standardized sizes and sold in the market without any alteration.

1.11 Organization of Study

The thesis is organized into six chapters. Chapter One discusses the overview of the study by highlighting the background of the study, statement of the problem, research objectives, significance of the study, limitation, delimitation of the study and definition of terms. The chapter further outlines the organization of the study. Chapter Two focuses on the literature review and provides concept of garment industry, overview of the fashion industry in Ghana, free-hand cutting skill and pattern making. The chapter further reviews, fit of garment, factors to consider in garment construction, effect of pattern and free-hand cutting methods in garment production, and the challenges of pattern/free-hand cutting on large-scale garment production. Base on the review, literature gaps are identified and highlighted in this chapter.

Chapter Three describes the research methodology employed in carrying out this survey research. This chapter discusses the research approach, research design, population of the study, sample size and sampling technique. It further presents data collection instrument, validity and reliability of the instrument, data collection procedure, and data analysis. It further describes the ethical consideration of the

study. Chapter Four involves the presentation of the results of the study under suitable themes based on the pertinent research questions. The findings are presented in the form of tables and figures as well as the analysis of the findings in the form of prose.

Chapter Five presents the discussion of the major findings of the study and the inferences made from such findings with reference to related prior studies. The major findings of the study are discussed under suitable themes developed from the pertinent research questions. The final part of the thesis, Chapter Six, describes the summary of results, managerial implications, recommendations, and suggestions for future research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses the theoretical and empirical studies related to free-hand cutting and pattern in garment industry. It specifically focuses on the concept of garment industry, overview of the fashion industry in Ghana, free-hand cutting skill and pattern making. This chapter further reviews, fit of garment, factors to consider in garment construction, effect of pattern and free-hand cutting methods in garment production, and the challenges of pattern/free-hand cutting on large-scale garment production.

2.2 Theoretical Framework

The study was anchored on skill-based acquisition theory. The scientific roots of Skill Acquisition Theory can be found in different branches of psychology, which ranges from behaviourism to cognitivism and connectionism (Dekeyser & Criado, 2013). This theory draws on Anderson's Adaptive Control of Thought (ACT) model which itself is a kind of cognitive stimulus-response theory (Ellis & Shintani, 2013). As mentioned by Parziale and Fischer (2009), it is a neo-Piagetian theory that amalgamates elements of both cognitive and behaviouristic theories.

The basic claim of Skill-based Acquisition Theory, according to Dekeyser (2013) is that the learning of a wide variety of skills shows a remarkable similarity in development from initial representation of knowledge through initial changes in behaviour to eventual fluent, spontaneous, largely effortless, and highly skilled behaviour, and that this set of phenomena can be accounted for by a set of basic principles common to acquisition of all skills. As indicated by Speelman (2005), skill

acquisition can be considered as a specific form of learning, where learning has been defined as the representation of information in memory concerning some environmental or cognitive event. Therefore, according to Speelman (2005) skill acquisition is a form of learning where skilled behaviours can become routinised and even automatic under some conditions. And, as a general theory of learning, it claims that adults commence learning something through largely explicit processes, and with subsequent sufficient practice and exposure, move into implicit processes. Development, within this theory, entails the utilization of declarative knowledge followed by procedural knowledge, with the latter's automatization (Vanpatten & Benati, 2010).

According to Chapelle (2009:19), this theory falls under the category of general human learning, i.e., it focuses "on the use of free-hand cutting and pattern making learning as a process of human learning". In other words, integrating of free-hand cutting and pattern making by dressmakers in view of such theories is considered to be like learning any other skill. Advocates of such theories consider practice to play the key role in learning. Fashion encompasses both the fashion object and the fashion process. Fashion process is a mechanism by which future fashion items travel to a popular recognition from their point of origin (Aklamati, Twum & Deikumah, 2016; Aboagyewaa-Ntiri & Apreku, 2012). Therefore, fashion designers can communicate efficiently it's designs to the buyers, merchandisers and marketing team through drawing designs.

2.3 Concept of Garment and Fashion Industry

The garment industry is an end-user industry from the perspective of the textile complex and it is made up of product development processes such as cutting,

sewing, contracting and marketing (United States Department of Labour, 2016). The garment industry can be seen as a sewn products industry which includes all stages of garment production, sewn interior furnishing products (draperies and linens), luggage, awnings, and sewn toys. According to the US Department of Labour (2016), the garment manufacturing industry worldwide is classified under the North America Industrial Classification System (i.e. NAICS 315). That classification is for the purpose of industrial trade, standards, and data collection. The garment sector has three sub divisions within the NAICS, which are:

- Garment Knitting Mills: NAICS 3151
- Cut and Sew Garment Manufacturing: NAICS 3152
- Garment accessories and other garment manufacturing: NAICS 3159.

Within the context of the NAICS, the garment industry is defined as: Firms in the Garment Manufacturing subsector group establishments with two distinct manufacturing processes: (1) cut and sew (i.e., purchasing fabric and cutting and sewing to make a garment), and (2) the manufacture of garments in establishments that first knit fabric and then cut and sew the fabric into a garment (United States Department of Labour, 2016). The Garment Manufacturing subsector includes a diverse range of establishments manufacturing full lines of ready-to-wear garment and custom garment: garment contractors, performing cutting or sewing operations on materials owned by others; jobbers performing entrepreneurial functions involved in garment manufacture; and tailors, manufacturing custom garments for individual clients are all included. Knitting, when done alone, is classified in the Textile Mills subsector, but when knitting is combined with the production of complete garments, the activity is classified in Garment Manufacturing (United States Department of Labour, 2016). Production of garment involves setting up of a clothes plant that

certainly involves skilled personnel in design, sewing, trimming, sticking and textile printing industries (Mayedul, 2017). Vanderhoff (2011) indicated that quantity garment production requires a variety of workers who have specialised skills. In such a set-up there is division of labour and specialization which affects efficiency, speed and quality that result in increase productivity. Cooklin (1990) as cited in Radclyffe-Thomas (2015) said after the fig tree concept, animal skins were sewn roughly together and tied around the body, he went on to say that the first garment cut to fit the body and limbs appeared during the Minoen Civilization (3000-1400BC).

Initially, needles were made of bones and horns while threads were crafted from animal sinew. Radclyffe-Thomas (2015) stated that needles were discovered about 1800 BC., he said until then only individual garments were made with very primitive tools. He emphasized that the earliest garment patterns were from the12thcentury, he said that according to Guild history by the 16th century tailors knew a great deal about proportion of the body and how to draft pattern for different types of garments. He concluded that women clothing construction developed rather late, most of their patterns were prepared by draping toile and adjusted style and fit with pins and tack stitches. Now man has developed sophisticated tools and machines for production of garments. The researcher believes that the power operated sewing machines coupled with varieties of automated cutting and spreading machines have increased the pace of production to meet the consumer demand. It has increased productivity and made ready-to-wear garments accessible in departmental stores which have resulted in price decrease.

The need to use clothes for various reasons is the basis of the clothing industry. Fashion industries are currently among the largest and fastest growing industries and have become a powerful force economically (Aboagyewaa-Ntiri &

Apreku, 2012). Clothes are used for various reasons but mainly for protective, decorative, modesty purposes (Amander, 2012). Mackinney (2012) indicated that clothing is worn in most communities for protecting the body against harsh weather conditions such as intense heat, heavy rain, cold and precipitation. According to Obinnim and Pongo (2015), there were a lot of changes in the fashion industry after the Second World War which resulted in more youthful styles and changed the focus of the fashion industry. Hodges and Karpova (2009) supported this assertion by maintaining that the fashion industry has continually been shaped by the global forces turning it into a more complex and far-reaching phenomenon. After the 20thcentury, advances in technology such as availability of sewing machines, rise in global capitalism and the development of the factory system of construction, has brought about mass construction of clothing in standard sizes. Four major cities, namely; Paris, Milan, New York City, and London have been acknowledged as current fashion capitals (Radclyffe-Thomas, 2015).

Clothing, beside food and shelter, has been recognized as the most basic necessities of people all over the world. Clothing is one of the essential needs of human beings and man cannot live without it. The style of cloth and the fabrics from which they are made must give warmth, maintain body temperature and must be comfortable to wear. As stated by Sampaio et al., (2017) and Isika (2014), many garment designers develop new products of various types in accordance with the trend set by the leading international designers.

The researcher is of the view that garment is very primarily important because it makes one look good and feel good about him/herself. Besides, they are very important because, in the culture settings, people do tend to judge others by the clothes or fashion styles they use.

2.4 Overview of the Fashion Industry in Ghana

Ghanaian fashion's history goes back to the pre-colonial era when the tribal Ghanaians dressed themselves with barks of trees and skins of animals (Sarpong, Howard & Osei-Ntiri, 2011). The design production in Ghana is believed to have started during the colonial era with colonial rulers adding wax prints and dresses (Sarpong et al., 2011). Globalisation has played a major role in the overhaul of Ghanaian fashion. Ghana, with an estimated population of 31,072,940 over the past few years have witnessed an immerse rise in fashion (News Agency, 2020). The revolution of Ghanaian in fashion has been described as a fast rising one. The gradual rise of Ghanaian fashion has been made possible with the help and efforts of organisations and individuals who have and are still contributing a quota to help raise the industry and put Ghana on the map. There is dynamism where certain pieces that was worn by our forefathers are still in existence but worn in a modernised way making fashion timeless (Sarpong et al., 2011).

As per Efajemue and Lilly (2017), more scientifically, fashion as described involves all kinds of clothing, textiles and their analysis. From the aforementioned meanings it is obvious that fashion applies not only to a trendy theme, but also to use for clothes and accessories for the human body. It also involves textiles in the form of materials for house, office and manufacturing machinery, which also involves a curriculum. The Fashion Industry takes care of the productions and sales of fashion products also. Fashion industry plays very prominent role in the socioeconomic development of every nation by helping generate income for living and it is a means through which people acquire their clothing needs (Efajemue & Lilly, 2017).

Fashion design is a service-oriented industry where the success of most establishments depends on performance excellence and customer delight. Clothes

made by fashion designers and fashion industries need to fit well and look attractive on the prospective users (Nzula & Opoti, 2014). However, in Ghana, this simple fact is underestimated as a result of poor fit in garment making among the informal dressmakers and tailors with respect to pattern and free-hand cutting (Obinnim & Pongo, 2015; Foster & Ampong, 2012). Studies by Mangieri (2006) revealed that, the input cost, including labour and energy, poor product quality, in agreement with the author, unpredictability of prices and lack of market outlet are some of the setbacks in the fashion industries in Ghana.

According to Foster and Ampong (2012), informal dressmakers and tailors industry in Ghana is growing speedily. Limited technical know-how on the skills with regard to pattern which ensures that garment comes out with unique style and improved fit, seems to pose problems in its use (Efajemue & Lily, 2011; Foster & Ampong, 2012). A study by Kinuthia (2010) indicated how informal dressmakers and tailors face a challenge in garment making due to the lack of education and training. Foster and Ampong (2012) indicated that adequate knowledge on the skills in pattern and free-hand cutting can boost confidence of the informal dressmakers and tailors thereby maximize income from their businesses. Another study by Stone (2013) affirms other challenges with fashion-designing, manufacturing, distribution, marketing, retailing, advertising and communication, publishing and consulting and entreats the need for excellence in the profession.

Parkins (2013) asserted that the biggest contributing factor to every nation depends on the growth and sustainability of its industry and economy. A viable fashion industry has the capacity of accommodating a huge number of people for designing, illustration, marketing, media and many more to bring the fashion product to the final user. Researchers were of the opinion that for Ghanaian fashion industry

to compete with the international garment industry there is the need for continual evaluation of the challenges facing the fashion industry especially the informal sector (Biney-Aidoo & Antiaye, 2013; Parkins, 2013).

The Ghanaian garment sector consists of small-scale dressmakers established as a one-person business (Ampofo, 2011). Ampofo asserts that in 1979, for instance, there were 138 medium and large-scale garment manufacturing companies in Ghana registered with the Ministry of Trade and Industry. However, this declined to 72 by 1995, with most of them, in Accra and Tema Metropolis. Under the President's Special Initiative (PSI) programme, a special dispensation by the Head of State under the Fourth Republic of Ghana was initiated to establish more local factories. Consequently, in response to the huge market opportunities created by the African Growth and Opportunity Act (AGOA), some garment firms were established in the Accra and Tema Metropolis (Biney-Aidoo & Antiaye, 2013). The intention of the Government was to make these garment firms become a leading export earner and also serve as a primary source for employment generation in Ghana but this aim has not been fully realized (Ampofo, 2011; Biney-Aidoo & Antiaye, 2013).

The researcher is of the view that the fashion industry in Ghana is growing and plays a prominent role in the socio-economic development of the nation by creating employment and income for the people who are seriously engage in the fashion business.

2.5 Free-hand Cutting Skill

Free-hand cutting as a method of cutting the fabric marked with chalk based on a measurement and cut directly without the use of a paper pattern (Foster & Ampong, 2012). Free-hand cutting was originally used throughout the world before

the invention of commercial sewing patterns. Free-hand cutting entails cutting a fabric directly, making use of the wearers measurement. According to Efajemue and Lily (2011), free-hand cutting is a method of cutting a style of garment directly on the fabric without the use of a pattern. Free-hand cutting is the art of cutting and making a garment to fit any body size (Bakker-Edoh, 2018). This method of cutting is distinctly different from the process of placing the commercial pattern pieces (cut style pieces) on a piece of fabric and cutting it out following instructions on the pattern. Tailors chalk may or may not be used to make markings on the fabric. The tailor or seamstress is usually very experienced, and over time have become accustomed to what he or she does (in most cases through trial and error) (Bakker-Edoh, 2018). In free-hand cutting, specific measurements are taken directly from the body and enrolled on the fashion fabric. Seam allowances and other intakes, depending on the style, are added to these measurements before cutting. After all pieces have been cut, various foundational sewing skills which must be acquired prior to attempting free-hand cutting are applied step-by-step in completing the garment (Bakker-Edoh, 2018).

A large part of free-hand cutting depends on the ability to sketch various designs with correct symmetry. This enables dressmaker to readily separate parts of style and draft components directly onto the fabric (Forster & Adamtey, 2009). Dressmakers also need to understand how to visualize garment from a 3-Dimensional look to a 2-Dimensional look. For example, a finished set-in sleeve (3-D) looks completely different from its flat pattern, 2-D look. In addition, it is important to understand quick conversions of measurements from whole numbers to fractions of the whole. E.g. A 36" bust circumference plus 4" seam allowance, is easily drafted and cut when folded as a 10-inch wide quarter (Recommended for light-weight

fabrics). The skill of free-hand cutting and sewing is mastered with practice over time; but never ending, because there are unlimited garment styles you can conceive.

Many types of garment worn these days apart from ready-to-wear garment are usually made from free-hand cutting. The measurement of the individual is utilised directly on the fabric in free-hand cutting. If a dressmaker or a tailor makes a mistake while using the free-hand cutting, the fabric is usually wasted. As per Shailong and Igbo (2009), free-hand method of garment construction may spoil the garment entirely, thereby wasting the fabric. In addition, free-hand cutting is time consuming and slow, therefore cannot be conveniently used for mass construction.

Boakye (2010) indicated that clients may prefer ready-to-wear clothes due to the unsatisfactory jobs from some dressmakers and tailors that use free-hand cutting for garment making. This has made the budget for clothing in some cases increase for individuals as a result of fabric wastage or increase in cost when patterns are used (Foster & Ampong, 2012).

2.6 Pattern Making Skills

Pattern making is the art of designing the outline of the plan or arrangement for sewing a cloth. Thomas (2009) posits that the first step in pattern making is taking of body measurements. Thomas recommends that when taking measurements for pattern making, the person should just wear normal underclothes, and if a lady, normal pantyhose and normal bra. Steele (2008) noted that a system of sizes and patterns made it possible to fit the body, especially the male body, without resorting to custom-made clothing. Kiron (2016) also indicated that patterns are needed in dress-making in order to obtain a better fit and to save fabric. Aldrich (2006) justifies the use of block patterns in the clothing industry because the blocks are constructed to

standard (average) measurements for specific groups of people but could also be drafted to fit an individual figure using personal measurements.

Pattern making is based on basic patterns with standard measurements but when employed in designing, one makes use of fitting darts to increase garment fitting (Aldrich, 2014). Anikweze (2013) added that pattern has several advantages which include the ability to design patterns to fit into economical fabric layouts, the possibility of restyling old patterns and out-of-date clothing into new ones. It also ensures ease in determining causes of mistakes during the making of the pattern and how to correct them. By pattern, one can plan properly and organize himself or herself efficiently during construction of garment (Rosen, 2004; Aldrich, 2014). According to MacDonald (2010) and Joseph-Armstrong (2010), patterns used in garment making bring out the good style of the garment and makes it fit better.

It became evident from the various researchers that Pattern has become necessary for a Fashion designer to enable them make different garments. Pattern is very interesting and important as it helps to interpret designs and understand it with technical ability which bring out the good style of the garment and makes it fit better. Patterns are made so that the same style can be duplicated when needed and multiple pieces can be made.

2.6.1 Pattern making in Garment Construction

Pattern making are categorized into three methods; namely: Flat-Pattern, Draping and Drafting (Apple, Smith & Coury, 2016; Bakker-Edoh, 2018). Flat-Pattern, according to Semptress (2012) is the art of taking a set of measurements, a sheet of paper, and a pen, and coming away with a pattern. Flat pattern is based on basic patterns with standard measurements but when employed in designing, one

makes use of fitting darts to increase garment fitting. Bakker-Edoh (2018) mentioned that flat-pattern has several advantages which include the ability to design patterns to fit into economical fabric layouts, the possibility of restyling old patterns and out-of-date clothing into new ones, the ease for determining causes of mistakes and how to correct them, and flexible planning for new procedures and efficient organisation of work.

Commercial patterns are designed patterns made by companies or industries. They are sold in different sizes, as Bakker-Edoh (2018) advises people to know their body measurements to select the right size. Apple et al. (2016) have indicated that the man's measured attitude should be natural and kept away from mirrors that make the garment fit in improperly with a normal position despite the assumption that the man is the perfect figure (one that is too erect and has tight and not loosely muscled). For a female, Thomas (2009) prescribes that the lady should stand straight and be relaxed in an upright posture with feet together. Taking accurate measurement is regarded as the foundation on which drafting as a method of pattern designing is built.

Efajemue and Lilly (2017) noted the precise measurement of such design principles as proportion, balance, rhythm, emphasis, and harmony. Kindersley (1996) as cited in Efajemue and Lilly (2017) suggested that precise measures are necessary to select the size of a pattern. She concluded that the ideal match is obtained by matching the own dimensions with the standard, taking into account the resistance and making changes there. Template fragments between the seam lines are determined, not from border to boundary. The art elements of design, like vertical lines, horizontal lines, diagonal lines, curved lines and shape, also use precise measurements to communicate emotions, ideas, feelings and moods as they are required (Efajemue & Lilly, 2017).

Isika (2014) claimed that precise dimensions would continue to suit design clothing. This ensures that the performance of every flat-scale pattern modeling method must rely on the precision and the exactness of the measurements to be taken. Body measurements are difficult to replicate, as each individual's "hand" with the tape measurement is different (Efajemue & Lilly, 2017). The most common measuring error is therefore too close to measurement. In Isika (2014), one or two fingers under the tape measure were suggested for easy measurement while Ha-Brookshire (2014) suggested helping somebody to guarantee accuracy. The location of the measured individual can differ in the period or throughout the measuring session.

Draping is an artistic approach in which the person makes a pattern by fitting a large rectangle of woven cloth around the body to fabric produce the dress pattern according to the curves of the body (Dove, 2016). Anikweze (2012) on the other hand describes draping as an artistic approach in which the person makes a pattern by fitting a large rectangle of woven cloth around the body so that the folds in the fabric produce the dress pattern according to the curves of the body.

Drafting is a process of pattern designing that is based on a set of body measurements. Therefore, taking accurate measurements is the foundation of creativity in pattern making. Okorie (2000) regards creativity and knowledge of measurements as imperative characteristics of garment designers. The basic pattern for men's wear (shirt and trouser) consists of several measurements to achieve custom fit (Dove, 2016). For shirt patterns, the needed measurements consist of neck, neckband, shoulder, chest, centre front length, centre back, back width, waist, arm length, arm circumference, and sleeve length. For trousers, the required measurements are the waist, seat (hip), high hip, thigh, knee, out-seam (side lengths), Inseam, and hemline (Dove, 2016). Aldrich (2014) recommends standard body measurements for

the dresses of men of average built (about 5ft 10ins or 178cm). Dove (2016) suggested that the actual measurement of the pattern piece for men will be larger than the body measurement for which it is designed in order to allow wearing ease.

The implementations of standardised sizes follow those design principles in the context of commercialised basic patterns of standard sizes, i.e.: line and path, shape and proportion, colour and texture (Wu & Ashdown, 2016). The line of a dress offers an eye-catching way. Vertical, horizontal, oblique or circular lines may be available (Wu & Ashdown, 2016). An idea that may mask a figure in question may be helped by the orientation of a line. For example, horizontal lines might make a woman look bigger than she is. The eyes of the viewer's follow the lines of the person (Wu & Ashdown, 2016).

Shape continues to be important in pattern design because it gives the clothing's silhouette or contour, although the form of the garment changes with fashion (Shin, 2013). The clothing's contours are based on the space relations in the design, and relate measures such as size and bulk (Dove, 2016). A good proportion is achieved if the different sections of a clothing relate well to the entire clothing. Different proportions correspond to different figures; therefore, Horton (2008) warns that when selecting the garment's style, its proportions and characteristics should be taken into account to disguise figural problems. In order to prevent too many alterations of patterns before achieving perfect fit, consideration of figure type and body measurements are necessary. Furthermore, she argued that the forms of women's bodies vary widely and therefore patterns are not only measured directly but in different figure types.

The colour can influence emotions and moods and is associated with aesthetics. Any colour symbols conveying many signals have been suggested by

Webber (1990) as cited in Anikweze (2013). Webber showed traffic light colours, without which traffic jams would take place. Webber found that although certain colours signify coolness, others seem warmer. The colours red, orange and yellow show anticipation and represent movement while gray, green and violet are smooth and give a feeling of calm. Even our experience demonstrates that while bright colours like red and yellow are happy and exciting, some people think black and gray are dim and depressing. Shin (2013) posits that dark colours tend to make people look smaller, while brighter colours could make people appear bigger. They therefore advise that women with heavy hips should choose cool colours for their skirts.

Texture is a significant aspect in architecture. Dove (2016) indicated that the texture is related to the sensation of contact. The fabric texture can be rough, voluminous, satiny or dull as wool, and soft as velvet. The texture contribute to an image of size was stated by Shin (2013). Therefore, rugged and smooth material tends to be greater than it is really. Similarly, shiny, brilliant textiles reflect more light, making one look bigger than the person actually is. The texture of a fabric helps in designing a garment that meets the need of the client. The texture contributes to an image of size. A good proportion is achieved if the different sections of a clothing relate well to the entire clothing.

2.6.2 Development of the Pattern Drafting System

Body shapes are analyzed to determine the measurements necessary to describe body length, width, curves, and angles. The essential measurements according to Dove (2016) are: **Length:** Hip depth, Shirt length, Back bodice length, Front bodice length, Apex level, Shoulder length, Arm length, and In-seam. **Width:** Hipline - front and back, Upper leg, Neck, Chest line - front and back, Arm, and

Waistline. **Curves and Angles***:* Waist to floor - side, center front, and center back, Contour waist to floor - front and back, and Shoulder slope

Dove (2016) also observed that width measurements varied considerably when taken with a tape measure. She therefore devised a method of using strips of pattern tissue paper one cm wide and long enough to encircle the part of the body being measured. Because the paper was relatively fragile, it will not depress the flesh without breaking; and an accurate measurement could be obtained. Igbo and Iloeje (2003) cited in Dove (2016) have suggested different methods of making patterns to obtain well-fitted garments for women with different figure types. These include flat pattern, draping, knock - off methods, computer aided design (CAD) and drafting pattern.

The flat-pattern method is where the entire pattern is drafted on a flat surface from measurements, using rulers, curves and straight-edges. Usually, flat patterning begins with the creation of a sloper or block pattern, a simple, fitted garment made to the wearer's measurements. Draping is the art of manipulating fabric directly on the dress form in three dimensions. It is the most creative way for a designer to turn design ideas into reality (Joseph – Armstrong, 1999). Knockoff pattern is the process of making copies of design of clothing, accessories, or any other product (Knowles, 2005). Knockoff pattern techniques allow one to create a new garment from an old one which may be too worn for continued use. If you have an item of clothing that you love but it is no longer wearable, or wish to have copies of it in other colours or fabrics, a copy of the pattern may be made with or without taking the garment apart.

Computer-aided design (CAD) is the use of computers to aid in the creation, modification, analysis, or optimization of a design (Gini, 2005). This software is used to increase the productivity of the designer, improve the quality of design, improve communications through documentation, and to create a database for manufacturing. Designs made through CAD software are helpful in protecting products and inventions when used in patent applications. CAD output is often in the form of electronic files for print, machining, or other manufacturing operations.

According to Adamtey (2009), pattern cutting is an exciting craft which is a means of achieving a shape around the body so that the body remains constant. Drafting is using the body measurement to construct the garment patterns. To obtain a successful result in drafting, one must have an accurate set of body measurement. Knowles (2005) also said drafting is a design process that involves taking measurements from a person's body or body form, adding ease to these measurements and then transferring these measures onto a paper pattern. This is done using pencil, tape measure, rulers, curves, scissors and tracing wheel. The finished paper pattern is placed on top of fabric as a guide to cutting out garment pieces.

2.7 Fit of Garment

Fit is directly related to morphology in the human body and the bulges of the human body affect most fitness issues (Ashdown, Lyman-Clarke, Smith & Loker, 2017). Ashdown and Mete (2008) cited in Ashdown et al. (2017) also confirmed garment that is well-suitable for the human body, that it is easy to move, i.e. does not have discolouration and is designed and shaped so that it seems to be a component of the person. Alexander, Lenda and Presley (2015) stated five factors in considering garment fit: easy, pressure, crop, equilibrium and environment. Alexander et al.

(2015) further claimed that clothes would seamlessly suit the body with sufficient room for easy movement and straining. These divergent definitions of fit reflect the lack of agreement within the industry on the features which are responsible for a good fit.

The Garment Fit is a key element of clothing quality and satisfaction (Song & Ashdown 2010), which has a longstanding focus on clothing research. Many scholars who have defined clothing appropriate in many dimensions owing to its varied characteristics (Anderson 2011; Biney-Aidoo & Antiaye, 2013). Cappelli (215) claimed that clothes fit in with the clothing relationship to the body combining visual fitness analysis and physical comfort assessment. Anikweze (2013) posit that fits is the way in which the clothes item fits into the body or the clothing item-bodies relationship. Anikweze (2013) noted that garment fit contains visual as well as physical satisfaction of the garments and its function on the body. Cao, Berkeley and Finlay (2014) also mentioned that fit is how well the garment conforms to the three-dimensional human body.

Good fit has often been described differently, based on fashion patterns, standardized sizes in the fashion industry and health expectations of fit garment (Biney-Aidoo & Antiaye, 2013). Semptress (2012) stated that an adequately fitting garment with ample wearing space, no unnecessary wrinkles or a show of fashion, and an aesthetically acceptable appearance should be sufficient. Dabolina, et al. (2019) also suggested that properly fit garment is the one that suits perfectly, that it has no lines that it lays comfortably on the curves of the body and looks relaxed. In all such debates, it is undeniably evident that the clothes will be placed over the body in order for garment to be measured. Thus, a well-built garment can attract the eye in an aesthetic way but it cannot be considered good fit until it is worn on the body for

consumer comfort in usage. As indicated by Forster, et al. (2018), good fitness of a clothing product should cover up the wearer's figure defects, compliment the body and provide balance. But for this to happen one of the reasons for making clothes is that they ornament the human body; in combination with proper body measurements, a garment should be of the right sizes, so that it can fit remarkably well.

Wren and Gill (2016) considered clothing fitness based on four main factors, namely: appearance, comfort, design, and fabric. They concluded that the fabric must be placed in to determine the hanging sections of the component elements of the fabric and evaluate the hanging of the whole garment on the body as expected. Both seams must always be at their assigned positions. Space for mobility ensures that there is ample scope for quick movement as you rise, climb, fall, sit and kneel. Good-fitting garment does not mean simply that it fits; it implies the style is fashionable at a specific moment.

Alexander et al (2015) also noted that fit contributes to the confidence and comfort of the wearer. This implies that the wearer is likely to feel comfortable and confident when wearing well-fitted clothing. Cappelli (2015) also indicated that fit is the most important factor in the subjective evaluation of comfort. A dressmaker or a tailor may choose to use a standard size that has been pre-graded on a purchased pattern or they may decide to design a pattern to better fit the wearer. This may be done by creating a sewer's garment template from inexpensive muslin material or by customising a computerised pattern to fit. The three-dimensional technology enables the home sewer to see the final garment as a virtual simulation on the wearer (Obinnim & Pongo, 2015; Dove, 2016). Garment fit problems for manufacturers, retailers and consumers are costly and frustrating (Dove, 2016). If garment is unfitting, the customer is disappointed regardless of the nature of the working

substance or the style of the garment. By having to make fewer changes to your clothes, consumers will also benefit from a better fit. Problems linked to fabric fit faced by buyers will also be reviewed (Dove, 2016).

2.7.1 Factors that Contribute to Garment Fit

There are numerous factors that contribute to consumers' clothing and fit preferences including comfort, aesthetics, and personal choice in assessing fit. Current fashion trends, cultural influences, age, sex, body shape, and lifestyle also influence personal fit preferences, and changes in these elements may result in changes in personal fit preferences over the life span (Dabolina et al., 2019). Wren and Gill (2016) asserted that physical comfort, psychological comfort and appearance all play in the consumer's perceived satisfaction of fit.

2.7.1.1 Garment Ease

Ease of garment is divided in two types: (a) wearing ease-the amount of extra fabric allowed over and above body measurements to ensure comfort, mobility, and drape of the garment and (b) design ease-additional amounts of fabric added to achieve certain design effects by changing the line and shape of a garment (DesMarteau, 2000 as cited in Biney-Aidoo & Antiaye, 2013). Because design ease is subjective, style dependent and not essential to the basic understanding of fit, so ease (DesMarteau, 2000 cited in Wren & Gill, 2016). According to Wren and Gill (2016), for the appearance and fit of the garment, optimum clothing facilities are critical. The optimum degree of fabric easiness is an essential versatility metric, presentation and health, because too little supportive facilities will obstruct motion and produce wrinkles on the surface of the fabric. Optimal levels of ease are important if a garment

fit to move the body is not to achieve great satisfaction unless the product is sufficiently stretchable or tightly mounted (Wren & Gill, 2016).

2.7.1.2 Body Cathexis

Body cathexis is defined as positive and negative feelings toward one's body. Various scales evaluating body cathexis have been used to examine attitudes toward the body. Alexander et al. (2015) found that respondents who were dissatisfied with their weight preferred a loose fit in dresses, and respondents who were satisfied with particular body parts (such as thighs, bust, or hips) preferred a closer fit in the area of concern.

2.7.1.4 Fabric Property

Fabric is also an important factor that affects the fit of garment, especially mechanical properties of fabrics, such as bending rigidity, the shear resistance, elongation of fabric-self-weight, and so on. Klerk and Ashdown (2008) as cited in Giovanelli and Farella (2016) mentioned that fabric is crucial to good fit. The same style will look and fit differently according to the fabric type used; soft or crisp fabric, for example. The clinging tendency, drape and grain line (for example, a basis cut) can lead to even a loose fitting garment defining the shape of the body (Klerk & Ashdown, 2008). For this reason, certain fabrics should be avoided when manufacturing for certain figure types. Proper fit has the appearance of comfort and is naturally proportionate to the figure, with appropriate amounts of ease for the achievement of a given fashion or garment style (Biney-Aidoo, et al., 2013). Fit is worse both when the garment is too big and when the garment is too small along a particular dimension. The amount of ease needed in a garment will vary by personal preference, the type of fabric used, and the design of the garment. However, less ease

is required for knitted fabrics than for woven fabrics. Certain elements of a garment are crucial to determining the fit of clothing (Song & Ashdown, 2010). Therefore, fashion designer should consider the fabric type for a particular design to achieve a good fit.

2.8 Factors to Consider in Garment Construction

There are factors to consider in clothing construction. The critical issue in dress designing is to achieve clothing fit. Klerk and Ashdown (2008) as cited in Bakker-Edoh, (2018) considered clothing fit as consisting of four main factors, namely: appearance, comfort, design, and fabric.

Appearance: To achieve elegant appearance, Tsang (2013) recommends different clothing designs that complement different body shapes and figures. Bakker-Edoh, (2018) that appearance refers to the visual appeal of garment when the consumer is wearing it. Attractive garments will however not be worn if they are not comfortable. It is thus important to be able to sit, bend, walk and stretch in any garment without feeling restricted or straining the seams. The following instances are noteworthy:

Hourglass shape - Women with hourglass shape (shoulders and hips equally wide with a narrow waist) have coveted figures with nothing to hide or compensate for. They can wear style of prom dress that is long, short, and sleeveless, with or without a jacket.

Busty shape - Women with busty shape (shoulders wider than hips) should wear dresses that de-emphasize the upper body, e.g. a gown that attracts the eye to the hemline or waistline. A scarf or a jacket can also assist to disguise the figure fault (Bakker-Edoh, 2018).

Triangle or Pear shape – Women in this category have hips wider than shoulders. Because of their bottom-heavy figure, they should wear prom dresses with an A line or full shirt to de-emphasize the hips. They can also have a fitted top to draw attention more to the upper portion of the body (Bakker-Edoh, 2018).

Petite Figure – Women that are short and heavy should choose garments that give illusions of height and draw attention to the face and hair, e.g. short skirts rather than ankle-length skirts. For short and slim women, shirtwaist dresses and business suits are recommended. Earrings, necklaces, and hairpieces can also be used to highlight the face, neck and upper body (Bakker-Edoh, 2018).

Square shape or Thick middle – Women in this category have shoulders, waist and hips are equally wide; the waist is not clearly indented such that waist measurement is similar to that of chest and hips. To appear elegant, choose unfitted, but not full, garments such as over blouses, empire lines, and tunic and log sweaters (Bakker-Edoh, 2018).

Comfort: In terms of comfort, wearing should allow the individual to sit, walk, reach and bend without feeling restricted, added sufficient ease to the body measurements. Comfort is one of the most important aspects of any clothing product. Comfort as an essential requirement of people, because of its complex nature, is very difficult to define (Tsang, 2013). As a consequence of the conceptualisation, description and study of the meaning of comfort, there are many various approaches to improve fabrics, processing techniques and garment design in order to attain comfort in the fashion and garment industries. Social historians such as Cowley have indicated that comfort is both a cultural and a technical innovation (Cowley, 2001). Li (2011) revealed that comfort is the end of a technology research driven by technological advances. Again, as quoted in Giovanelli and Farella (2016), Potters

(1999) described comfort as an experience in the following four contexts: (1) physical sensation; (2) social interpersonal, parental and societal relations; (3) psychosocial-psychological-internal awareness of self; and (4) meaning in life. Clothing comfort is a very complex subjective perception, which is related to interactions between fabrics, climate, physiological and psychological variables, which varies from person to person (Lu, Song & Li, 2014).

Garment comfort is the result of a balanced heat exchange processes between the wearer, environment and clothing, in particular the ability of clothes to transmit heat and humidity from skin to environment (Efajemue & Lilly, 2017). Nevertheless, the clothing comfort revealed as a friendly condition that arises from the mental, psychological and physical equilibrium between human beings and climate (Raval, 2013). Clothing convenience is typically divided into three broad categories, esthetic convenience, thermo physiological comfort and tactile convenience. Aesthetic or psychological ease is focused primarily on subjective experiences and patterns in style that affect consumer tastes. The physiological comfort Thermo on the other hand concerns the fabric's capacity to maintain a heat balance between the human body and the environment (Raval, 2013). Thermo-physiological comfort levels of the person are mutually determined by the thermo-moisture and air pressure features of the fabric content. The tactile comfort is connected to a mechanical connection between the materials of the clothing and the human body and is an essential requirement for clothing performance (Raval, 2013).

At this point, it is indisputable that when we think about clothing comfort, several variables come into play. The content of the fabric's fibre and the environmental suitability of the fabric and the construction techniques used in the assembly of the fabric. However, the manufacturer has little influence over the fibre

content and the choice of the cloth by the customer, it is the designer's realm who selects acceptable constructional techniques to guarantee good clothing comfort. Similar studies report that comfort and garment fit have been shown in Holleczek, et al. (2010), Gupta and Zakarias (2014); Fu et al., (2014) were the two most important attributes of sportswear among ten different attributes examined. According to a consumer survey report conducted by the International Research Institute on Social Change (RISC) (2018), 80% of women and 83% of men in USA selected comfort as the top attribute they seek in garment products. Intrinsic attributes of a garment product like workmanship in sewing, physiological comfort, usefulness, physical and chemical properties play an important role in the quality assessment process for a garment (Kamalha, Zeng, Mwasiagi & Kyatuheire, 2013). Therefore, properties of clothing comfort are playing more and more important roles in the modern market, and significantly influence the competitiveness of individual garment manufacture. Persons involved with textile and garment making have to perceive and to link innovations into craftsmanship in designing. The requirements for the fit of garments may mean the balance of different properties of stretch, drape, smoothness, etc. for different end uses and then get desired comfort as well as aesthetic appeal in the garments (Raval, 2013).

Design: In the case of design, the amount of ease added to a garment is based on the design which is either a loose fit (example: caftan), a close fit, or a combination of the two (example: shirtwaist dress with a pair of trousers). Klerk and Ashdown (2008) mentioned that design would determine the features of the garment. This creates a certain look, for example close fitting or loose fitting. Ease of movement and / or design ease are added to the body measurements when the pattern is created. This ensures that the desired look is created, a certain level of comfort is achieved, and in

this way, the appearance of the garment is enhanced. Shin (2013) also noted two different types of ease. These are functional ease and design ease. Functional ease refers to the amount of fabric that allows for body movement, and design ease is described as the amount of fabric needed to demonstrate the design of the garment. This is to say that functional ease can be described as a basic requirement during construction whereas design ease may be employed or not depending on the garment design.

2.9 Effect of Pattern and Free-hand Cutting Methods in Garment Production

Bray (2009) writes that the main drawback of free-hand cutting on haute couture approach to garment creation is the time required for the many attempts to produce a perfect shape for just single garment, and this renders the approach unsuitable for modern mass construction. The measurement of individual is utilised directly on the fabric in free-hand cutting. If a dressmaker or a tailor makes a mistake while using the free-hand cutting, the fabric is usually wasted. According to Shailong and Igbo (2009), free-hand method of garment construction may spoil the garment entirely, thereby wasting the fabric. In addition, free-hand cutting is time consuming and slow, therefore cannot be conveniently used for mass construction.

Bray (2009) further reiterated that the advantages of pattern outweigh that of free-hand cutting in the sense that the outcome of pattern cutting results in conformance to international designs whereas the free-hand cutting operates within the traditional settings and therefore, conforms to traditional design cues. Pattern has the ability of restyling old patterns as well as out of date clothing into fashionable ones to suit the demand of the time and also the ease of determining causes of mistakes on a particular design and flexible planning for correcting procedure

(Tamakloe, 2011; Larbi & Atta, 2009). Tamakloe (2011) outlined that pattern skills increase productivity and maximize profit and ensure business survival and growth.

Larbi and Atta (2009) affirmed that pattern helps to identify certain faults that might arise on the design and seek to adapt remedies to the problem before construction. In contrary, the free-hand cutting skills only identify the problem through fitting after sewing which waste much time and resources (Tamakloe, 2011; Larbi & Atta, 2009). Patterns are accurate to a point; therefore, good fitting is likely to be achieved. They are available in different sizes to suit different figures. If the accompanying instructions are carefully followed, the results are satisfactory (Christensen, 2017). Patterns are inexpensive in the long run in that several dresses could be made from one pattern. They give dresses a tinge of professional touch. Finally, printed pattern process can be easily used by inexperienced dressmakers as the instructions are clearly provided. However, there are challenges to be faced by anyone that wishes to embark on large scale garment production, because of its numerous techniques involved.

Steele (2008) noted that a system of sizes and patterns made it possible to fit the body, especially the male body, without resorting to custom-made clothing. Dove (2016: 117) also indicated that patterns are needed in dress-making in order to obtain a better fit and to save fabric. Aldrich (2006) justifies the use of block patterns in the clothing industry because the blocks are constructed to standard (average) measurements for specific groups of people but could also be drafted to fit an individual figure using personal measurements. Anikweze (2013) affirmed that pattern making ensures ease in determining causes of mistakes during the making of the pattern and how to correct them. By pattern, one can plan properly and organize himself or herself efficiently during construction of garment (Aldrich, 2014).

According to MacDonald (2010) and Joseph-Armstrong (2010), patterns used in garment making bring out the good style of the garment and makes it fit better.

The researcher is of the view that employing both free-hand cutting and pattern give the constructed garment professional touch that suits clients need and also it helps reduces waste and mistakes on a particular design and flexible planning for correcting procedure.

2.10 Challenges of Pattern/Free-hand Cutting in Garment Production

Consequently, a garment should be designed and produced to fit the human body's three-dimensional forms and satisfy the criteria for appearance, quality and wearing comfort (Aklamati et al., 2016). In this respect the quality in the clothing industry needs to continuously be improved. Several garments are made from free-hand cutting except for ready-to-wear garments. Sewing with modified designs requires a number of restrictions. The methods for drawing and modifying designs are time consuming and challenging for a novice individual prior to placing, cutting and stitching (Aklamati et al., 2016). Dressmaking can be boring or frustrating if the person lacks the necessary skills. Perhaps the dressmaker cannot meet the customer's needs. Some people engage in a structured modelling curriculum. Many people have already given up sewing because the outcome is frustrating. Based on this, training and workshops should be organized by stakeholders to improve the knowledge and skills of the dressmakers and tailors.

2.11 The challenge of Choice of Texture of Fabrics

It has been noted that texture contributes to an impression of size. Hence, there is the challenge of selecting fabrics with textures that would reflect the needs or

fashion desires of potential buyers of garments produced on a large scale (Lewis & Loker, 2014). Perhaps the climate or seasons of the year may assist in determining whether rough and thick textures or shiny and lustrous fabrics would be selected for garments. This is because rough and thick textures seem to give more bulky impression than they really are while shiny and lustrous fabrics reflect more light and thus make one to appear larger than the person really is. More importantly, the practice of not wearing the right texture of fabric in line with the weather condition could predispose the individual to the attack of pneumonia or heat rashes (Ezema, 2001; Radclyffe-Thomas, 2015). Garment makers on a large scale must give consideration to these factors (Radclyffe-Thomas, 2015)

2.12 The Challenge of Figure and Styles

Figure type is the different shapes seen on human beings or a representation of a person. Adult figure types are grouped according to height and proportion (Mayedul, 2017). Mayedul, (2017) had analyzed figure types into four categories, namely: short and slender, short and plump, tall and slender, tall and plump. Obinnim and Pongo (2015) provide a more comprehensive analysis as they identified seven figure types that are easily recognizable among women. The authors went further to recommend the corresponding styles of garment to choose and to avoid. The figure types, according to them, are the proportionate tall and slender, short and plump, flat chest, large bust, short neck, long neck and large hips. The best of the figure types is the proportionate. Any individual who does not fall into the proportionate figure type can be said to have a figure problem. Figure problems according to Obinnim and Pongo (2015), flat chest, large bust, short neck, long neck and large hips. The main challenge in pattern making and free-hand cutting is the ability to take accurate body

measurements for sizing and grading to suit the variance of figure type for mass construction (Obinnim & Pongo, 2015).

Most people, both men and women, like to possess a variety of clothes such as shirts, blouses, skirts, coats, dresses, jackets etc but those that really appear fashionable endeavour to select only the clothes that match their figure types. The styles of dresses chosen by anybody with a figure problem would determine whether or not the figure faults will be hidden, exposed or even exaggerated (Ampomah, 2015). Figure and style are part of the principles considered by designers and makers of ready-to-wear dresses from commercial garment production. Some potential consumers especially women may find it difficult to select garments from the market due to their peculiar figure problems. The garment industry should therefore not only make necessary allowance for adjustments to their designer dresses but also provide coaching points for tailors that would undertake the adjustments (Ampomah, 2015).

2.13 Conceptual Framework

A Conceptual Framework was developed based on the extensive review of literature. Conceptual framework is a diagrammatic representation of the variables and how they interact to achieve the purpose of the study (Brunswick, 2009). The variables used in the study were the independent demographic characteristics which comprised of free-hand cutting and pattern. The intervening variables comprised of the factors that might influence the use of free-hand cutting and pattern. The dependent variable of the study was perfect fit of garment.

The use of free-hand cutting or pattern are being influenced by many factors. These factors can be political environment and socioeconomic factors. The political environment are the institutions and legislations and the public and private stakeholders who operate and interact with or influence the garment industry.

Changes in the government influence the policies relating to the garment industry in Ghana. Socioeconomic factors such as experience, training received and educational level that might influence the dressmaker ability to use free-hand cutting or pattern as a preferred method of garment making. In addition, financial support, training and seminars might affect the use of free-hand cutting and pattern in producing a garment. The challenges of a dressmaker or a tailor also has the potential of influencing their ability to use free-hand cutting or pattern for perfect fit.

Also, an individual's exposure to a particular method of garment construction during a training period can greatly influence the type of method he or she will use after the training period. One's experience on a job usually builds up the confidence and ability to learn new ways of doing things. This implies that the training received and the richer the experience of a dressmaker or tailor, the better his or her demeanour to try new designs and methods which in effect reflect on the trainee (apprentice). Figure 2.1 shows the conceptual framework of the study.

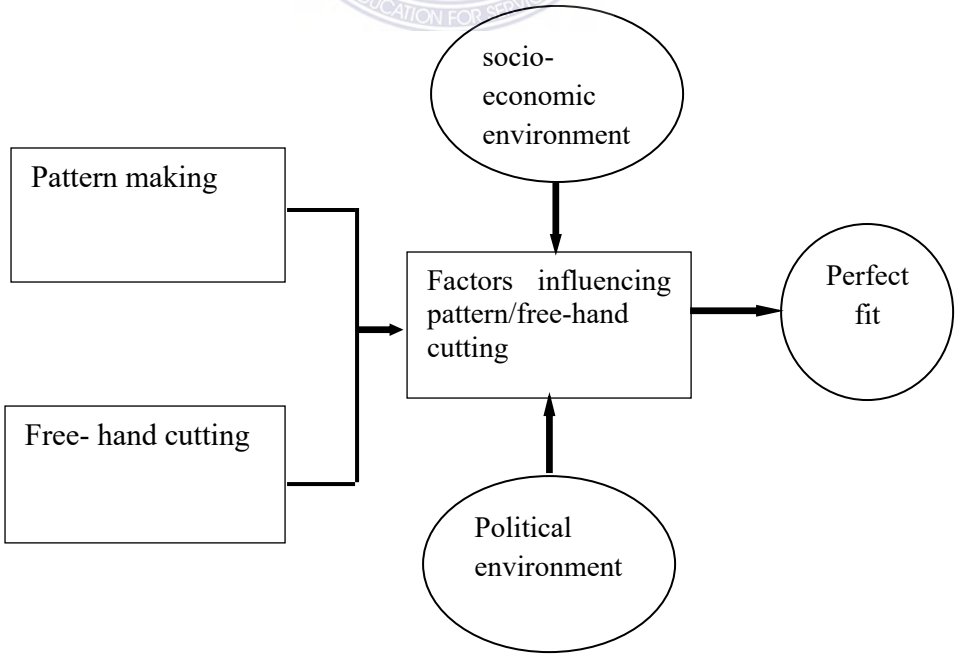

Figure 2.1: Effect of free-hand cutting and pattern on final garment
Source: Researchers construct, 2020

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter deals with the description of methods used in carrying out the study. This chapter specifically describes the research design, population, sample and sampling technique of the study, development of research instruments and technique for data analysis. It also deals with the validity and reliability of the instrument. The data collection procedure and method of data analysis were also described.

3.2 Research Approach

Research approach is a systematic and logical procedure for solving a problem with the support of facts (Yin, 2003). Denzin and Lincoln (2000), assert that research approaches may be categorized as qualitative, quantitative and mixed method. The quantitative research method adopts a deductive and objective view, which is characterized by tangible data such as counts, weight, mass, and other physical measures (Fellows & Liu, 2003). Qualitative research on the other hand, adopts the inductive and subjective view of knowledge of the real world. It views individuals or organizations in a holistic manner rather than isolated variables and hypotheses (Phoya, 2012). The qualitative method seeks to explore the meanings, attitudes, values, beliefs of people associate with a phenomenon in order to establish a better understanding, rather than to test to support or disprove a relationship (Boateng, 2014). The third approach as indicated by Denzin and Lincoln (2000); Creswell (2003) is the multi-methodology or mixed methods approach. As the name implies, it is the combination of both quantitative and qualitative approaches (methods) to

collect and analyse data in a particular study (Denzin & Lincoln 2000; Creswell & Clark 2007).

In this study, mixed method approach was adopted. This approach was adopted because it provides the researcher with an in-depth look at contexts, processes and interactions and it makes it possible to obtain a precise measurement of attitudes and outcomes. In addition, this research approach capitalises on the strengths of both quantitative and qualitative research and offers greater possibilities than a single method approach for responding to decision-maker agenda (Bryman, Becker, & Sempik, 2008). Furthermore, the aim of a mixed methods research approach is not to replace qualitative or quantitative research, but to make use of the strengths of both while minimizing their respective weaknesses in a particular research undertaking and across studies (Johnson & Onwuegbuzie, 2004). Moreover, a mixed method approach enables a researcher to obtain a more comprehensive understanding of educational phenomena, ranging from simple to complex, particular to general and from internal to external perspectives (Greene, 2005).

3.3 Research Design

Research design is a set out guidelines that linkup the elements of methodology adopted for a study namely; relating the paradigm to the research strategy and then the strategy to methods for collecting empirical data (Denzin & Lincoln, 2000). It is a plan that guides the researcher in the process of collecting, analyzing and interpreting observations (Nachmias & Nachmias, 1993).

The study utilised cross-sectional survey design. A cross-sectional survey was used for this study as it has the advantage of soliciting respondent's views on the nature of the situation as it existed at the time of a study (Creswell, 2012). The design

is an efficient way of collecting information of a large group of people within a short time using questionnaires. The survey design was deemed appropriate for this study as it has the advantage of seeking the views of informal dressmakers and tailors on the use of pattern and free-hand cutting in garment construction.

3.4 Population of the Study

The population of the study includes road side dressmakers and tailors, fashion designers and final year fashion students of public tertiary institutions in Kwadaso Municipality, Sunyani East Municipality and Asafo Area. The total target population was estimated at 1377 respondents, comprising; 276 registered road side dressmakers, 152 tailors, 108 fashion designers and 841 fashion students at University of Education, Kumasi Campus (UEW-K), Sunyani Technical University (STU) and Kumasi Technical University (KsTU). Level 200 and 300 fashion students were chosen from the Technical universities, whiles level 300 and 400 fashion students were selected from UEW-K. The category of fashion students were selected because they have better knowledge in patterns and free-hand cutting technique as compared to level 100 of fashion students. The fashion students were selected because they are acquiring skills to fit in the fashion industry. The target population details are as shown in Table 3.1.

Table 3. 1: Distribution of Dressmakers/Tailor and fashion designer's population

Group		Total population			Total
	Schools	Kwadaso	Sunyani East	Asafo Area	
Dressmakers		135	107	34	276
Tailors		83	51	18	152
Fashion Designers		58	39	11	108
Students	UEW-K	323	---	---	323
	KsTU	---	---	316	316
	STU	---	202	---	202
Total		**599**	**399**	**379**	**1377**

Source: Researcher field work, 2020

The total number of wayside dressmakers, tailors and fashion designers were collected from the Registration Record Book of the Ghana National Tailors and Dressmakers Association (GNTDA) (GNTDA, Record Book, 2019). The total number of fashion students was collected from fashion departments at University of Education, Kumasi Campus (UEW-K), Sunyani Technical University (STU) and Kumasi Technical University (KsTU).

3.5 Sampling Technique and Sample Size

Multi-stage sampling method was used for this study and it involved three stages. Due to the vastness of the study area (i.e. Kumasi and Sunyani), there was the need to narrow the study area by developing study stratas. The first stage involved purposive selection of communities from Kumasi and Sunyani area. The process of judgment or purposive sampling is based on the assumption that the researcher is able to select elements which represent a 'typical sample' from the appropriate target population. Purposive sampling also referred to as judgmental or selective or subjective sampling is a non-probability sampling that is characterized by a deliberate effort to gain representative samples by including groups or typical areas in a sample (Patton, 1990).

The second stage involved the selection of individual dressmakers and tailors as well as fashion designers from the selected communities using convenience sampling technique. Convenient sampling technique was used to pick respondents to talk about issues related to the free-hand cutting and patterns. Convenience sampling technique was employed because it helps in gathering useful data and information that were not possible using probability sampling techniques, which require more formal access to lists of populations. Also, convenient sampling technique was used in

selecting the fashion students from tertiary institutions in the selected area. During the COVID-19 pandemic, the researcher deemed it necessary to select students that could be reach.

The ever-increasing need for a representative statistical sample in empirical research has created the demand for an effective method of determining sample size. To address the existing gap, Krejcie and Morgan (1970) came up with a table for determining sample size for a given population for easy reference. According to the Krejcie and Morgan (1970), table of determining sample size, a population of 1377 requires a sample size of 302 bringing the percentage to 21.9% approximately 22.0%. The sample size comprised the dressmakers/tailors, fashion designers and fashion students. Table 3.2 shows the sample size determination.

Table 3. 2: Sample Size Determination

Respondents	Population	Sample size
Dressmakers	276	61
Tailors	152	33
Fashion Designers	108	24
Fashion Students	841	184
Total	**1377**	**302**

Source: Researcher field work, 2020

3.6 Data Collection Instruments

The study employed questionnaire, focus group interview, and observation as a data collection instrument.

3.6.1 Questionnaire

Questionnaire was used to collect data from dressmakers and tailors, fashion designers and fashion students. Questionnaire is a carefully designed tool, made of

questions and sometimes with or without alternatives to choose from. Questionnaires are useful with large sample sizes and research respondents who are usually difficult to contact. It also elicits more candid and more objective replies suitable for the respondent to check his or her information (Marshal et al., 2011).

The questionnaire for the respondents (i.e. dressmakers, tailors, fashion designers and fashion students) were divided into three subsections. Section A elicited data on respondents' demographics while Sections B and C were made up of questions on the use of pattern and free-hand cutting in garment construction. The use of questionnaire promotes the identity or privacy of the respondents and also resources and time which is crucial and adequately saved. It is for this reason that the questionnaire comprising of both open ended and close ended was chosen as a tool for collecting information for this work.

3.6.2 Focus Group Interview

An important step in the process of data collection is to find the right people, places and gain access to and establish rapport with subjects so that they can provide valuable information (Creswell, 2007). According to Kvale (1996), interviews are an interchange of ideas among two or more individuals on a topic of common interest, are based on the centrality of human interaction for knowledge production and emphasised the social situations of research data. Primarily, focus group interviews were designed for some dressmakers and tailors in Kwadaso Municipality and Sunyani East Municipality possibly because of low level of education. Focus group interviews have been used successfully in homogeneous groups of populations in order to determine the needs and preference of the groups (Ekblad & Baarnhielm, 2002). According to Kumepkor (2002), focus group interviews are types of interviews

that provide qualitative, descriptive data in the assessment of educational programmes. This point shows that interviews help with getting critical ideas from people who have detailed knowledge of the study under investigation.

A structured focus group discussion guide was used to collect information from selected dressmakers and tailors in Kwadaso and Sunyani East Municipality. The focused group interviews consisted of 6 participants from Kwadaso Municipality and 5 from Sunyani East Municipality that were present during the focused group interview. A focus group interview employed in this research was appropriate qualitative method for generating a range of ideas. For the focus groups, a semi-structured interview guide was developed to elicit dressmakers and tailors views about clothing items using pattern and free-hand cutting.

The focused group interviews consisted eleven (11) participants. The responses were recorded and later transcribed. The participants were named: Focused Group Interview (FGI) (FGI 1 - FGI 6) from Kwadaso Municipality and Focused Group Interview (FGI) (FGI 7 - FGI 11) from Sunyani East Municipality. The focused group interview conducted sought to compliment the questionnaire for the quantitative data.

3.6.3 Observation

Observation check list was given to judges to evaluate the procedure and processes in garment making both free-hand cutting and patterns methods. This instrument was used by judges to observe the fit of garment sewn by the selected dressmakers and tailors before evaluation. An observation checklist was developed which contained major constructional processes. These processes were graded good or poor depending on its accuracy as portrayed by the dressmaker.

An evaluation criterion was also used during the observation. This helps in evaluating garment made by some selected dressmakers and tailors using the two methods (free-hand cutting and patterns). The finished products were worn by a model. This instrument was used to assess the fit of three garments sewn (i.e. Princess Line Dress, Roll Collar Blouse, and Bra cap blouse) using free-hand cutting and pattern technique. The fitness of Princess Line Dress was assessed on the neckline, shoulder, bust, waist, nape to waist, panel lines, hips, dress length, sagging at the back, sleeve length, sleeve bicep (around arm), arm scye (armhole), and style drape. The Roll Collar Blouse was evaluated on the neckline, shoulder, roll line, break point, break line, style line, and fall. However, the bra cap blouse was assessed on the neckline, bust, bra cap size, and the bra cap appearance.

3.7 Validity and Reliability of the Instrument

Validity and reliability are important aspects of any research. Because of the difference between them, validity and reliability can be addressed in different ways. Their importance was discussed with respect to both qualitative and quantitative data.

3.7.1 Validity

In any research, 'validity' is an important concept to keep in mind. If a research has low validity, it is worthless (Cohen, et al., 2005). The study used content validity technique to assess the validity of the research instruments. This technique refers to the extent to which a measure or instruments adequately covers the topic it is supposed to cover under the study (Kothari, 2004). The technique ensures that the variables as stated in the objectives are being measured appropriately. Expert advice was sought from supervisors and their suggestions were used to make necessary

corrections in the instruments. Content validity was ensured through well-constructed items and well-edited statements to suit the level of understanding of the respondents.

3.7.2 Reliability

Reliability is another important measure of sound measurement. Reliability is another important element that determines the quality of the instruments and the measured results (Muijs, 2004). Best and Kahn (2005) define reliability as the extent that the instrument measures whatever it is measuring consistently. According to Kothari (2004), an instrument is reliable if it produces consistent results. To ensure a high internal consistency in this study, a reliability test was conducted using the Cronbach alpha technique. According to Santos (1999), the Cronbach's Alpha correlation coefficient may be used to describe the reliability of factors from multi-point formulated questionnaires or scales.

Santos (1999) further points out that though 0.7 is the most accepted and reliable threshold, above 0.5 is also acceptable. Six Cronbach's Alpha tests were computed for measuring pattern, free-hand cutting, and fit of garment by pattern and free-hand cutting, comfortability by pattern and free-hand cutting, appearance by pattern and free-hand cutting, and style modification by pattern and free-hand cutting. All items in different constructs were measured on a 5-point Likert-type scale and Cronbach's Alpha for all the constructs was presented.

3.9 Data Collection Procedure

The researcher obtained an introductory letter from the Department of Fashion Design and Textiles Education, University of Education, Winneba – Kumasi Campus to carry out the research work in the selected study area. The researcher visited the

dressmakers/tailors and fashion designers shops and when permission was granted, questionnaires were distributed. The questionnaire was self-administered to the dressmakers/tailors, fashion designers and fashion students at the study area. The respondents were given one week starting from the day of administering the questionnaire to answer the questionnaire. However, some of the respondents completed and delivered their questionnaire on the spot with concern that it might be misplaced due to their busy schedules.

The researcher prior to the interview established positive rapport with the dressmakers and tailors in order to obtain the right information from them. The interviews were conducted at the beginning of March, 2021. During the interview the responses of the participants were recorded using a mobile phone and the researcher noted all the relevant information during the discussions and transcribed them immediately after the discussions. The interview was conducted for half an hour.

For the observation, three fashion lecturers at Sunyani Technical University were contacted to be the Judges. These judges were available during the time of evaluation of finished garments. An appointment was booked with the Judges to be involved in evaluating the garment constructed with patterns and free-hand cutting. A model was contacted to display the garment constructed. The evaluation of the garment constructed with free-hand and pattern took place on 9th March, 2021 at Sunyani Technical University production room. The meeting for the evaluation was done on two different occasions.

3.10 Method of Data Analysis

Data analysis is the process of bringing order, structure and meaning to the mass of information collected (Mugenda & Mugenda, 2003). The data collected was

coded and the SPSS Version 23.0 was used for the analysis. The data from the focus group discussion guides were also transcribed and put into themes. The data collected were summarised and analysed using both quantitative and qualitative methods. The quantitative data was presented in a tabular form using descriptive statistics such as frequencies and percentages. In addition, ANOVA was used to test the difference between of the views of the respondents on the effect of integrating of pattern and free-hand cutting methods in garment production. The qualitative data obtained from the respondents during the interview sessions were presented in common themes to bring out similarities and differences. The qualitative data was analyze thematically.

3.11 Ethical Considerations

Ethical considerations can be specified as one of the most important parts of the research. For this study, the researcher sought for a research approval letter from the Department of Fashion Design and Textiles Education, University of Education, Winneba – Kumasi Campus in order to seek permission from the dressmakers and tailors. The researcher obtained full consent from the research participants prior to the study. Subsequently, selected participants were informed about the purpose of the study.

The researcher also informed the participants that their participation was voluntary and they had the rights to withdraw from the study at any stage if they wished to do so without any harm or risk. In order to protect the privacy, participants were not requested to indicate their names and those of their organizations. Moreover, the researcher assured participants confidentiality of the data they provided and assured them that, such information was solely going to be used for the purpose of this thesis only.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF RESULTS

4.1 Introduction

This chapter presents the results of the study. It focuses on the response of road side dressmakers and tailors, fashion designers and fashion students of public tertiary institutions in Kumasi and Sunyani Metropolis of Ghana. The results specifically relate to the effect of free-hand cutting on finished garment, effect of the use of patterns on finished garment, effect of fitting of free-hand cutting and patterns on finished garment, and the effective use of both free-hand cutting and patterns in garment construction.

4.2 Response Rate

In total, 302 questionnaires were sent out to collect data from respondents. These comprised 61 dressmakers; 33 tailors; 184 fashion students; and 24 fashion designers. However, after the data collection exercise and editing, it was realized that 242 out of the 302 questionnaires sent out were usable in the analysis. Whilst some of the questionnaires were not retrieved, key questionnaires that were critical in meeting the study objectives were not answered on some of the returned questionnaires.

Therefore, the analysis of the study was based on 80.1% response rate. This response rate was acceptable to make conclusions for the study. Mulusa (1998) says that 50.0% response rate is adequate, 60.0% is good and 70.0% very good. Therefore, 80.1% response rate was hence considered very good to provide required information for the purpose of data analysis. Table 4.1 shows how questionnaires were distributed and collected from the respective respondents chosen for the study.

Table 4. 1: Distribution and Collection of Questionnaires from Respondents

Sample area	Number Issued	Number Returned	Not Retrieved	Percentage Returned (%)
Dressmakers	61	59	2	96.7
Tailors	33	27	6	81.8
Fashion students	184	138	46	75.0
Fashion designers	24	18	6	75.0
Total	**302**	**242**	**60**	**80.1**

Source: Field Survey, 2021

4.3 Socio-Demographic Characteristics of Respondents

This section describes the general background information of the respondents. The background information is meant to make use of the respondents' characteristics in cross tabulations in order to establish more trends on the respondents' responses on comparing the use of free-hand cutting and patterns in garment industry.

4.3.1 Gender of Respondents

The responses with regard to the gender of the respondents are presented in Table 4.2.

Table 4. 2: Gender of Respondents

		Gender of respondents				Total	
		Male		Female			
		f	%	*f*	%	*F*	%
Job title of respondents	Dressmakers	0	0.0	59	100.0	59	24.4
	Tailors	22	81.5	5	18.5	27	11.2
	Fashion students	64	46.4	74	53.6	138	57.0
	Fashion designers	10	55.6	8	44.4	18	7.4
Total		**91**	**37.6**	**151**	**62.4**	**242**	**100.0**

Source: Field Survey, 2021

On the gender of respondents, the study shows that 37.6% of the respondents were males with the remaining 62.4% were females. As illustrated by Table 4.2, the

implication is that females dominated in the fashion industry in Ghana as of the time of carrying the research and in the areas review. The gender of the dressmakers selected, were all females. However, 81.5% of the tailors selected were males, whiles 18.5% were females. In addition, 46.4% of the fashion students sampled were males and 53.6% of them were females. In addition, with respect to the fashion designers, 55.6% were males, whereas 44.4% were females. This signifies that there are more females than their male counterparts in the clothing and textile industry.

4.3.2 Age Category of Respondents

Table 4.3 presents the responses with regard to the age category of the respondents.

Table 4. 3: Age Category of Respondents

		Age of respondents (years)								Total	
		18-25		26-35		36-45		Above 45			
		F	*%*	*f*	*%*	*f*	*%*	*f*	*%*	*F*	*%*
Job title of respondents	Dressmakers	0	0.0	28	47.4	25	42.4	6	10.2	59	24.4
	Tailors	1	3.7	7	25.9	15	55.6	4	14.8	27	11.2
	Fashion students	58	42.0	42	30.4	38	27.5	0	0.0	138	57.0
	Fashion designers	1	5.6	4	22.2	11	61.1	2	11.1	18	7.4
Total		**60**	**24.8**	**79**	**32.6**	**91**	**37.6**	**12**	**5.0**	**242**	**100.0**

Source: Field Survey, 2021

As depicted in Table 4.3, the respondents were fairly distributed among the age brackets set out on the questionnaire. With regards to age of dressmakers, the statistics in the Table 4.3 indicates 47.4% of the respondents were between 26-35 years; 42.4% were between the age categories of 36-45years. The remaining 10.2% of the respondents were between above 45years. From the statistics, it could be inferred that the majority of the dressmakers are at their youthful age. Concerning the Tailors age category, 3.7% were between the age range 18-25years; 25.9% of them were between the ages of 26-35years, whiles, 55.6% were in the age category of 36-

45years. In addition, 14.8% of the participants were above 45years. This suggests that majority of the Tailors were at their youthful age between 26-45 years.

With respect to the fashion students, 42.0% of them were between the ages of 18-25years, and 30.4% of the respondents were between the ages of 26-35year. However, 27.5% of the fashion students were between the ages of 36-45years. Moreover, 5.6% of the fashion designers sampled were 18-25years of age, 22.2% of them were between the ages of 26-35years. Conversely, 61.1% of the fashion designers were between the ages of 36-45years and the remaining 11.1% of the respondents were above 45years. This implies that the fashion designers included in the study were at their youthful age between 26-45years.

4.3.3 Educational Level of the Respondents

The data of the respondents on their education level were collected and is shown in Table 4.4.

Table 4. 4: Educational Level of the Respondents

		Highest level of education										Total	
		No formal education		Primary		JHS		SHS		Tertiary			
		F	*%*	*f*	*%*	*f*	*%*	*f*	*%*	*f*	*%*	*f*	*%*
Job title of respondents	Dressmakers	6	10.2	0	0.0	15	25.4	38	64.4	0	0.0	59	24.3
	Tailors	7	25.9	4	14.8	5	18.5	11	40.7	0	0.0	27	11.2
	Fashion student	0	0.0	0	0.0	0	0.0	0	0.0	138	100.0	138	57.0
	Fashion designers	0	0.0	0	0.0	0	0.0	6	33.3	12	66.7	18	7.4
Total		**13**	**5.4**	**4**	**1.7**	**20**	**8.3**	**55**	**22.7**	**150**	**61.9**	**242**	**100.0**

Source: Field Survey, 2021

In terms of the highest level of education of the dressmakers, the results pointed out that 10.2% of them had no formal education, 25.4% of the respondents had attained education up to the JHS; 64.4% of the respondents had attained education up to secondary level. The pattern of highest educational levels attained by the dressmakers indicates that they are not highly educated. Concerning the tailors 25.9%

of them had no formal education, 14.5% had attained education up to the primary level. However, 18.5% of them had attained education to the Junior High School level and 40.7% had attained education to the Senior High School level. This implies that majority of the tailors had attained some form of education.

On the educational level of the fashion students, all of them had education up to the tertiary level. Moreover, 33.3% of the sample fashion designers had attained education up to the senior high school level, whereas 66.7% had attained education to the tertiary level. This indicates that the fashion students and the fashion designers had high educational background to argue professionally on the issue relating to free-hand cutting and pattern in the garment industry.

4.3.4 Number of years practicing in the garment industry

The view of the respondents were solicited on the number of years they have been practicing as dressmaker/tailor or fashion designer. Table 4.5 presents the results

Table 4. 5: Respondents Years of Practice

		Years of practicing								Total	
		1-5years		6-10years		11-15years		Above 15years			
		F	*%*	*F*	*%*	*f*	*%*	*f*	*%*	*f*	%
Job title of respondents	Dressmakers	14	23.7	29	49.2	6	10.2	10	16.9	59	24.3
	Tailors	0	0.0	11	40.7	5	18.5	11	40.7	27	11.2
	Fashion students	87	63.0	51	37.0	0	0.0	0	0.0	138	57.0
	Fashion designers	2	11.1	9	50.0	4	22.2	3	16.7	18	7.4
Total		**113**	**46.7**	**100**	**41.3**	**15**	**6.2**	**24**	**9.9**	**242**	**100.0**

Source: Field Survey, 2021

Table 4.5 reveals that 23.7% of the dressmakers had been practicing for 1-5years, 49.2% of them had been practicing for 6-10years, whereas 10.2% of the dressmakers had been practicing for 11-15years. However, 16.9% of the dressmakers had been working for more than 15years. Moreover, concerning the tailors working

experience, 40.7% of them had been working for 6-10years, 18.5% of the tailors had been working for 11-15years. In addition, 40.7% of the tailors had been practicing for more than 15years. On the other hand, 63.0% of the fashion students have been practicing for 1-5years, and 37.0% had also been working for 6-10years. Conversely, 11.1% of the fashion designers have been practicing their trade for 1-5years, 50.0% of them have been in the business for 6-10years, whereas 22.2% of the fashion designers have been working for 11-15years. The remaining 16.7% of the fashion designers have been working for more than 15years. The finding implies that the dressmakers, tailors, fashion students and fashion designers included in the study have been in the garment industry for many years and are in the best position to give relevant information with regards to free-hand cutting and patterns in garment construction.

4.3.5 Training used by the Respondents

The results of the respondents on the training they used in teaching their apprentices are summarized in Table 4.6.

Table 4. 6: Training Used by Respondents

		Garment construction method						Total	
		Patterns		Free-hand cutting		Both			
		f	%	*f*	%	*f*	%	*f*	%
Job title of respondents	Dressmakers	15	25.4	44	74.6	0	0.0	59	24.3
	Tailors	6	22.2	21	77.8	0	0.0	27	11.2
	Fashion students	79	57.2	43	31.2	16	11.6	138	57.0
	Fashion designers	11	61.1	5	27.8	2	11.1	18	7.4
Total		**111**	**45.9**	**113**	**46.7**	**18**	**7.4**	**242**	**100.0**

Source: Field Survey, 2021

The study found out that 25.4% of the dressmakers had been constructing garment with patterns, and 74.6% of them had been using free-hand cutting technique in the construction of garment. The findings further revealed that none of the dressmakers employed both skills in the construction of garment. In addition, 22.2%

of the tailors included in the study employed patterns for construction garment, whereas 77.8% of them solely used free-hand cutting. However, none of the tailors used both technique in construction garment. From these results, it could be concluded that dressmakers and tailors were most comfortable in using free-hand cutting. For the fashion students, 57.2% of them used patterns in constructing garment, 31.2% of them affirmed that they employed free-hand cutting for construction garment, whiles 11.6% of the fashion students mentioned that they used both technique during garment construction. With respect to the fashion designers, 61.1% of them had been using patterns for constructing garment, 27.8% of them have been using free-hand cutting for constructing garment. However, the remaining 11.1% of the fashion designers posited that garments are constructed with the use of pattern and free-hand cutting technique. This clarifies that the majority of the fashion students and the fashion designers employed both technique in garment construction. This implies that in the next years to come Ghanaian fashion designers will produce garments that meet the consumers satisfaction in terms of perfect fit.

4.4 Effect of Free-hand Cutting on Finished Garment

The effect of free-hand cutting on the finished garment were measured by 9 statements and the results obtained were ranked in descending order as shown in Table 4.7. The effect of free-hand cutting on the finished garment were measured with mean and standard deviations and the significant mean level was fixed at 3.0. The statement above 3.0 threshold is considered as significant effect of free-hand cutting on the finished garment and those type below the cut-off point were rejected. ANOVA test was conducted to compare the view of the dressmakerstailors, fashion students, and fashion designers whether their view differ from each other or not.

Table 4. 7: Responses on the Effect of Free-hand Cutting on Finished Garment

Effect of free - hand cutting on finished garment	Descriptive		One – Way ANOVA[(a)]			Decision
	Mean	Std. Dev	F	Sig. (2-tailed)	Mean square	
Garment made with free-hand cutting look elegant on the body	3.95	1.106	15.340	.000[a]	15.903	Accepted
Free-hand cutting brings out the good style in garment	3.93	1.029	10.260	.000[a]	9.732	Accepted
Free-hand provides special features to garment	3.73	1.173	13.514	.000[a]	16.085	Accepted
The right side and wrong side appearance of garment made with free-hand cutting appeal to the user	3.70	1.080	15.348	.000[a]	15.182	Accepted
Free-hand cutting facilitates variations of styles	3.67	1.203	9.280	.000[a]	12.162	Accepted
Skills on free-hand cutting allow more room for future modification of style	3.52	1.252	5.406	.001[a]	8.030	Accepted
Garments made from free-hand cutting are faultless	2.86	1.345	5.470	.001[a]	9.373	Rejected
Free-hand cutting contributes to perfect fit of a garment	2.67	1.323	2.319	.129[c]	2.299	Rejected
Garment made from free-hand cutting makes the wearer comfortable than any other method	2.65	1.365	6.723	.000[a]	11.696	Rejected

Note: [a]P< 0.01, [b]P< 0.05, [c]P< 0.1 *x-bar ≥3.0 = Agreed*

Source: Field Work, 2021

Table 4.7 presents the mean value of the respondents response on the effect of free-hand cutting on the finished garment. The respondents accepted that garment made with free-hand cutting look elegant on the body. This statement attained a means score of 3.95 and a standard deviation of 1.106. From the ANOVA analysis, a significant difference between the views of the dressmakers tailors, fashion students, and fashion designers were attained (F= 15.340, p=0.000<0.01). In addition, with a mean score of 3.93 and a standard deviation of 1.029, the respondents accepted that free-hand cutting bring out the good style in garment. The ANOVA test showed a significant different between the view of the the dressmakers, tailors, fashion students, and fashion designers (F= 10.260, p=0.000<0.01).

According to the respondents free-hand provides special features to garment. This statement had a corresponding mean of 3.73 and a standard deviation of 1.173.

On this statement, the views of the dressmakers tailors, fashion students, and fashion designers differs at a significant value of 1% (F=13.54, p=0.000<0.01). Conversely, the respondents agreed that the right side and wrong side appearance of garment made with free-hand cutting appeal to the user. This statement attained a mean of 3.70 and a standard deviation of 1.080. ANOVA test shows a significant difference (F=15.348, p=0.000<0.01) between the views of the respondents on the issue that e right side and wrong side appearance of garment made with free-hand cutting appeal to the use.

Moreover, the respondents are of the view that free-hand cutting facilitates variations of styles. This statement attained a mean score of 3.67 and a standard deviation of 1.203. The view of the dressmakers, tailors, fashion students, and fashion designers differ with respect to each other (F=9.280, p=0.000<0.01). However, with a mean score of 3.52 and a standard deviation of 1.252, the respondents revealed that skills on free-hand cutting allow more room for future modification of style. The ANOVA test showed a significant difference (F=5.406, p=0.001<0.01) between the respondents on the statement that skills on free-hand cutting allow more room for future modification of style.

On the contrary, the respondents disagreed that garments made from free-hand cutting are faultless. The statement reflected a mean of 2.86 and a standard deviation of 1.345 with a significant difference at 0.001. This shows that the views of the dressmakers, tailors, fashion students, and fashion designers differ. Also, the respondents indicated that free-hand cutting contributes to perfect fit of a garment. This statement had a mean of 2.65 and a standard deviation of 1.365 which is below the predetermined cut-off point. There was an insignificant difference on the views of the respondents concerning the statement that free-hand cutting contributes to perfect fit of a garment. The respondents further disagreed that garment made from free-hand

cutting makes the wearer comfortable than any other method. This statement had a mean score of 2.65 and a standard deviation of 1.365 which is below the cut-off point. From the ANOVA analysis, a significant difference ($F=6.723$, $p=0.000<0.01$) was ascertain concerning the views of the dressmakers, tailors, fashion students, and fashion designers.

The result shows that with free-hand cutting method, garment look elegant on the body, brings out the good style in garment, provides special features to garment, right side and wrong side appearance of garment appeal to the user, facilitates variations of styles, and allow more room for future modification of style. However, the views of the dressmakers, tailors, fashion students, and fashion designers were significantly different from each other.

4.5 Effect of the use of Patterns on Finished Garment

In determining the effect of the use of patterns on finished garment, descriptive statistics were used to measure the variables. The results obtained were ranked in descending order as shown in Table 4.8. The statements were measured with mean and standard deviations and the significant mean level was pegged at 3.0. Anything above 3.0 bench marks is considered as strong effect and those below 3.0 cut-off point is rejected and considered as weak. ANOVA test was conducted to compare the views of the dressmakers, tailors, fashion students, and fashion designers whether their view differ from each other.

Table 4. 8: Responses on the Effect of Pattern on Finished Garment

Effect of pattern on finished garment	Descriptive		One – Way ANOVA[(a)]			Decision
	Mean	Std. Dev	F	Sig. (2-tailed)	Mean square	
Patterns used in garment making bring out the original style	4.36	.744	1.199	.311	2.662	Accepted
Patterns promote variations of styles	4.27	.868	0.868	.458	2.655	Accepted
Garment made with patterns fits well on the body	4.23	.857	0.931	.426	6.373	Accepted
The use of patterns gives special features to garment	4.20	.743	1.453	.228	.798	Accepted
Garment made with patterns looks outstanding on the body	4.19	.823	3.084	.028[b]	1.045	Accepted
The use of patterns makes the garment unique	4.17	.768	1.898	.131	1.107	Accepted
The right side and wrong side appearance of garment made by patterns looks nice	4.14	.813	2.644	.050[b]	1.712	Accepted
Garment made with patterns look elegant on the body	4.13	.799	1.652	.178	2.036	Accepted
Garment made from patterns feel more comfortable in wearing than any other method	4.05	.874	1.865	.136	1.411	Accepted
Garment made from patterns are faultless	2.73	1.252	2.684	.047[b]	4.118	Rejected

Note: [a]P< 0.01, [b]P< 0.05, [c]P< 0.1 *x-bar ≥3.0 = Agreed*

Source: Field Work, 2021

Presented in Table 4.8 are the mean score showing the effect of pattern on finished garment. This finding indicated that patterns used in garment making bring out the original style with a mean score of 4.36 and a standard deviation of .744. The ANOVA analysis shows no significant difference between the views of the dressmakers, tailors, fashion students, and fashion designers (F=1.199, p=0.311>0.05). However, the respondents agreed that patterns promote variations of styles. This statement attained a mean of 4.27 and a standard deviation of .868. The ANOVA test showed an insignificant difference (F=0.868, p=0.458>0.05) between the views of the dressmakers, tailors, fashion students, and fashion designers.

Again, the respondents agreed that garment made with patterns fits well on the body. This statement attained a mean score of 4.23 and a standard deviation of 0.857. However, the ANOVA test found no significant difference (F=0.931,

p=0.426>0.05) between the views of the dressmakers, tailors, fashion students, and fashion designers. With a mean score of 4.20 and a standard deviation of 0.743, the respondents agreed that the use of pattern gives special features to garment. The analysis of variance shows no significant difference (F=1.453, p=0.228>0.05) between the views of the respondents on the statement that the use of pattern gives special features to garment.

An indication from Table 4.8 revealed that garment made with patterns look outstanding on the body, with a mean score of 4.19 and a standard deviation of 0.823. However, the ANOVA analysis shows a significant difference (F=3.084, p=0.028<0.05) between the views of the respondents on the issue that garment made with patterns look outstanding on the body. Conversely, the respondents agreed that the use of patterns makes the garment unique. This statement attained a mean of 4.17 and a standard deviation of 0.768. There was no significant difference (F=1.898, p=0.131>0.1) between the view of the dressmakers, tailors, fashion students, and fashion designers on the statement that garment made with patterns look outstanding on the body.

Furthermore, the respondents mentioned that the right side and wrong side appearance of garment made by patterns looks nice. This statement attained a mean of 4.14 and a standard deviation of 0.813. The ANOVA analysis showed a significant difference (F=2.644, p=0.050<0.05) between the views of the dressmakers, tailors, fashion students, and fashion designers on the statement. With a mean score of 4.13 and a standard deviation of 0.799, the respondents agreed that garment made with patterns looks elegant on the body. The ANOVA analysis shows no significant difference (F=1.652, p=0.178>0.05) between the views of the respondents on the issue that garment made with patterns looks elegant on the body.

Again, the respondents reveal that garment made from patterns feel more comfortable in wearing than any other method with a mean score of 4.05 and a standard deviation of 0.874. There was no significant difference (F=1.865, p=0.136>0.05) between the views of the respondents on garment made from patterns feel more comfortable in wearing than any other method. Interestingly, the respondents disagreed to the statement that garment made from patterns are faultless. The view of the respondents on this issue was statistically significant (F=2.684, p=0.047<0.05). This means that the response of the dressmakers, tailors, fashion students, and fashion designers were different on garment made from patterns are faultless.

The finding shows that garment made with pattern brings out the original style, promotes variations of styles, fits well on the body, gives special features to garment, look outstanding on the body, and makes the garment unique. Also, it appears that with pattern technique, the right side and wrong side appearance of garment looks nice, garment look elegant on the body, and makes the wearer feel more comfortable than any other method.

4.6 Effect of Fitting of Free-hand Cutting and Patterns on Finished Garment

In ascertaining the effect of fitting of free-hand cutting and patterns on finished garment, descriptive statistics were used to measure the variables. The results obtained were ranked in descending order as shown in Table 4.9. The statements were measured with mean and standard deviations and the significant mean level was pegged at 3.0. Anything above 3.0 bench marks is considered as strong effect and those below 3.0 cut-off point is rejected and considered as weak. ANOVA test was conducted to compare the view of the dressmakers, tailors, fashion students, and fashion designers whether their view differ from each other.

Table 4. 9: Responses on Effect of Fitting of Free-hand Cutting and Patterns

Effect of fitting of free-hand cutting and patterns	Descriptive		One – Way ANOVA[(a)]			Decision
	Mean	Std. Dev	F	Sig. (2-tailed)	Mean square	
Free-hand cutting (*x*=3.75)						
Garment made with free-hand cutting fits better on the shoulder.	3.91	.909	8.642	.000[a]	6.522	Accepted
The sleeve of a garment made with free-hand cutting fits better on the arm.	3.90	.934	12.123	.000[a]	9.298	Accepted
The garment made with free-hand cutting fits better on the bust.	3.88	.970	12.851	.000[a]	10.537	Accepted
Garment made with free-hand cutting fits better on the waist	2.90	1.315	6.627	.000[a]	4.266	Rejected
Garment made with free-hand cutting fits better on the hip.	2.87	1.357	5.824	.001[a]	3.826	Rejected
Garment made with free-hand cutting drapes well on the body.	2.79	1.427	15.185	.000[a]	10.537	Rejected
Patterns (*x*=4.14)						
The garment made with pattern fits better on the bust.	4.23	.720	1.806	.147	.928	Accepted
The sleeve of a garment made with pattern fits better on the arm.	4.19	.760	.956	.414	.553	Accepted
Garment made with pattern fits better on the hip.	4.17	.768	1.731	.161	1.011	Accepted
Garment made with pattern fits better on the shoulder.	4.12	.772	1.898	.131	1.118	Accepted
Garment made with pattern drapes well on the body.	4.09	.883	2.439	.065[c]	1.869	Accepted
Garment made with pattern fits better on the waist	4.05	.882	2.810	.040[b]	2.137	Accepted

Note: [a]P< 0.01, [b]P< 0.05, [c]P< 0.1 *x-bar ≥3.0 = Agreed*

Source: Field Work, 2021

Presented in Table 4.9 shows the mean score on the fitting of garment made with free-hand cutting and patterns. On free-hand cutting, the respondents accepted that garment made with free-hand cutting fits better on the shoulder with a mean score of 3.91 and a standard deviation of 0.909. The ANOVA test found significant difference between the views of the respondents (F=8.642, p=0.000<0.01). Also, the respondents accepted that the sleeve of a garment made with free-hand cutting fits better on the arm. This statement reflected a mean score of 3.90 and a standard deviation of 0.934. The findings showed a significant difference between the views of the respondents (F=12.123, p=0.000<0.01).

Moreover, with a mean score of 3.88 and a standard deviation of 0.970, the respondents accepted that garment made with free-hand cutting fits better on the bust. ANOVA test showed a statistically significant (F=12.851 p=0.000<0.01). difference between the views of the respondents on garment made with free-hand cutting fits better on the bust. On the contrary, the respondents rejected that garment made with free-hand cutting fits better on the waist (mean=2.90), garment made with free-hand cutting fits better on the hip (mean=2.87), and garment made with free-hand cutting drapes well on the body (mean=2.79). These statements failed to meet the predetermined cut-off point of 3.0. However, the view of the respondents on these statements were statistically significant difference from each other at 1%. This indicates that garment made with free-hand cutting fits better on the shoulder, sleeve fits better on the arm, and fits better on the bust.

On the effect of fitting of garment made with pattern, the respondents accepted that garment made with pattern fits better on the bust. The respondents accepted all the statements relating to fitting of garment made with pattern. With a mean score of 4.23 and a standard deviation of 0.720, the respondents accepted that garment made with pattern fits better on the bust. There was no statistically significant difference between the views of the respondents (F=1.806, p=0.147>0.1). The statement that the sleeve of a garment made with pattern fits better on the arm had a mean of 4.19 and a standard deviation of 0.760. No significant difference (F=0.956, p=0.414>0.1) was found between the views of the respondents on the statement that the sleeve of a garment made with pattern fits better.

Also, the respondents accepted that garment made with pattern fits better on the hip. This statement had a mean score of 4.17 and a standard deviation of 0.768. The ANOVA test shows no statistically significant difference (F=1.731, p=1.161>0.1)

between the views of the respondents. It appears from the study that garment made with pattern fits better on the shoulder. The respondents accepted this statement with a mean score of 4.12 and a standard deviation of 0.772. The view of the respondents was statistically insignificant (F=1.898, p=0.131>0.01). An indication from Table 4.9 reveals that garment made with pattern drapes well on the body. The respondents accepted with a mean score of 4.09 and a standard deviation of 0.883. The view of the respondents was different at a significant level of 10% (F=2.439, p=0.065<0.1). The statement that garment made with pattern fits better on the waist reflected a mean score of 4.05 and a standard deviation of 0.882. There was a statistically significant difference (F=2.439, p=0.040<0.05) between the views of the respondents on garment made with pattern fits better on the waist. The findings show that garment made with pattern fits better on the bust, arm, hip, shoulder, waist and drapes well on the body.

The overall result shows that with an average mean score of 4.14, garment made with pattern fits better than garment made with free-hand cutting with a mean score of 3.75.

4.7 Effectiveness of Free-hand Cutting and Pattern in Garment Construction

In determining effectiveness of using both free-hand cutting and patterns in garment construction, descriptive statistics were used to measure the variables. The results obtained were ranked in descending order as shown in Table 4.10. The items were measured with mean and standard deviations and the significant mean level was pegged at 3.0. Anything above 3.0 bench marks is considered as strong factors and those below 3.0 cut-off point is rejected and considered as weak. ANOVA test was conducted to compare the view of the respondents.

Table 4. 10: Responses on Effective use of both Technique in Garment Construction

Effect of both techniques in garment construction	Descriptive		One – Way ANOVA[(a)]			Decision
	Mean	Std. Dev	F	Sig. (2-tailed)	Mean square	
Garment made from both free-hand cutting and patterns have similarities to ready-made clothes	4.09	.981	6.472	.000	5.833	Accepted
Free-hand cutting and patterns eliminate mistakes in garment construction	4.08	.863	3.830	.010	2.756	Accepted
The use of both free-hand cutting and patterns have the ability of restyling old patterns	4.05	.990	6.390	.000	5.872	Accepted
Free-hand cutting and patterns are both conveniently used for mass construction	4.05	1.029	6.389	.000	6.345	Accepted
The use of both free-hand cutting and patterns saves fabric in garment construction	3.96	.948	2.900	.036	2.547	Accepted
The use of free-hand cutting and patterns saves time in garment construction	3.80	.889	2.289	.079	1.780	Accepted

Note: [a]P< 0.01, [b]P< 0.05, [c]P< 0.1 *x-bar ≥3.0 = Agreed*

Source: Field Work, 2021

As displayed in Table 4.10, the mean score ranges from 3.80 – 4.09 which is above the cut-off point of 3.0 and therefore all the statements were accepted by the respondents. The respondents agreed that garment made from both free-hand cutting and patterns have similarities to ready-made clothes. This statement attained a mean of 4.09 and a standard deviation of 0.981. There was a significant difference between the views of the respondents (F=6.472, p=0.000<0.01). Also, it appears that free-hand cutting and patterns eliminate mistakes in garment construction with a mean score of 4.08 and a standard deviation of 0.863. The ANOVA test shows a statistically significant difference between of the respondents (F=3.830, p=0.010<0.05).

Furthermore, the respondents agreed that the use of both free-hand cutting and patterns have the ability of restyling old patterns. This statement had a mean of 4.05 and a standard deviation of 0.990. There was a statistically significant difference (F=6.390, p=0.000<0.01) between the views of the respondents that the use of both free-hand cutting and patterns have the ability of restyling old patterns. Conversely, it

finding shows that free-hand cutting and patterns are both conveniently used for mass construction. This statement attained a mean score of 4.05 and a standard deviation of 1.029. A statistically significant difference ($F=6.389$, $p=0.000<0.01$) was found between the views of the respondents. Again, with a mean of 3.96 and a standard deviation of 0.948, the respondents accepted that the use of both free-hand cutting and patterns saves fabric in garment construction. The opinions of the respondents differ from each at a significant level of 5%. According to the respondents, the use of free-hand cutting and patterns saves time in garment construction. This statement attained a mean of 3.80 and standard deviation of 0.889. There was statistically significant difference between the opinions of the respondents at the level of 10%.

These results show that garment made with both techniques (i.e. free-hand cutting and pattern) eliminate mistakes in garment construction, and have the ability of restyling old patterns. Also, it was discovered that both techniques are conveniently used for mass garment construction, saves fabric and time in garment construction.

4.8 Analysis of Qualitative Data

On the socio-demographic characteristics of 11 participants, 7(63.3%) of the participants were males with the remaining 4 (36.4%) being females. Concerning the age category, 6 (54.5%) were between the ages of 26-35years, 2 (18.2%) were between the age category of 36-45years. The remaining 3 respondents constituting 27.3% were above 45years. With regards to educational status, only 8 (72.7%) of the participants had no formal education and 2 (18.2%) and 1(9.1%) of the participants had completed primary and secondary level respectively. Lastly, 7 (63.3%) of the participants indicated that they had been practicing as a dressmaker or tailor 6-

10years. However, 2 (18.2%) each of the respondents have 1-5years, and 11-15years respectively.

4.8.1 Comparing Free-hand Cutting and Patterns in Garment Industry

To complement the quantitative data, qualitative data were gathered on comparing the use of free-hand cutting and patterns in garment industry. The respondents in this study spoke about many aspects of free-hand cutting and patterns in garment industry. As a whole, the 11 participants commented that free-hand cutting is the currently used method for designing a garment. They further revealed that they are comfortable with free-hand cutting for garment construction. Commenting on the general outlook of the final garment constructed with free-hand cutting, most of the participants reported that free-hand cutting gives good result and presents nice outlook of final garment constructed. Some of the view point of the respondents includes:

FGI 1 remarked:

> *".....I have mastered in free-hand cutting in male garment production…and free-hand cutting gives better result and accuracy which is about 85.0% fit.*
>
> *I prefer free-hand cutting because is simple method and avoids stress and also looks beautiful*…[FGI, 2, 2021]
>
> *"……..free-hand cutting is easy to use as compared to pattern. After the final work it works very well on the wearer……..even I do not have idea on how pattern are drafted*….[FGI, 3, 2021]

FGI 4 commented:

> *"…….with the use of free-hand cutting, the final garment constructed looks good on the wearer and has room for any adjustment. Free-hand cutting makes the final products looks nice and beautiful on the wearer……"*

> *The use of free-hand cutting is easy and simple. It also makes the garment look nice and fit the client too* [FGI, 7, and FGI, 10, 2021]

The respondents further reported that they hardly use pattern. It was clear that the dressmakers had limited knowledge in usage in pattern for cutting out garment pieces or construction. It was obvious that, most of the participants have heard about flat pattern in the fashion trade but greater number of the dressmakers/tailors interviewed do not use pattern at all when cutting out because those who are using patterns learnt it whiles they were in school as reported by the participants. The following were some views from participants:

FGI1 remarked:

> *".....have only use pattern once in my working years. It also gave good result but the technicalities were hard to understand. Again, it wastes a lot of time and money...."*

FGI 2 indicated:

> *".....using pattern for cutting out garment makes it looks attractive and beautiful more than the free-hand cutting....but the pattern waste more time....."*

> *".....pattern does not help when it comes to garment construction....more mistakes are seen after the final product...*[FGI 3, 2021].

> *"....I have not try my hand on pattern before....but I have seen the final garment before and it looks very good and perfect on the wearer.....[*FGI, 4 and FGI, 5....2021].

FGI 6 revealed:

> *"....pattern marking is long process, and sometimes I even become confused but is not all that bad. Using pattern technique makes the dress look elegant and nice on the client.*

> "*...Pattern makes the final garment look nice and perfect on the wearer, since every measurement is accurate...."* [FGI, 10 and FGI, 11, 2021]

On the view of the participants in comparing free-hand cutting and that of pattern, it became evident that both techniques end at one result. It was revealed that free-hand cutting and pattern remain the foundation of designing garment in the fashion industry which come with variances of fit and modifications of style. According to the respondents they are conversant with the free-hand cutting than the pattern. The free-hand cuttings is easy, saves time, money and give good fitting when the dressmaker/tailor is good at it. The respondents proffered the following in comparing free-hand cutting and that of pattern:

> *".....free-hand cutting give good fitting.....it does not waste time and money and that is why I prefer free-hand cutting than the use of pattern……..for pattern I cannot say much about it because I stop because it was confusing....[*FGI, 1, FGI, 6, 2021]

> *"...Pattern makes garment designs very neat as compared to free-hand cutting. In addition, free-hand cutting needs more calculation before cutting it….* [FGI, 2 and FGI 5, 2021].

FGI 3 reported that:

> *Free-hand is very fast to handle, whiles pattern is very slow for my liking.....I recommend that designers should use free-hand cutting because it saves time, fabric and energy if only you are good at using free-hand cutting*.

As indicated by FGI 4:

> *Free-hand is fast and easy to learn…illiterates or even people with no educational background can easily learn free-hand cutting……whiles pattern requires more education and understanding before it is being able to learn…meanwhile free-hand cutting and pattern end up the same result…"*

> *"……*Free-hand cutting is easy and fast….pattern is bit confusing because I have no idea about it….though pattern does not waste fabric it fit well than free-hand cutting*… "[*FGI, 7, FGI, 8, 2021]

> *"...free-hand cutting is what has been used since the beginning of my business but I can bet free-hand is far better than pattern due to time factor. Pattern may be somehow accurate but it waste time and money from the look of things...."*[FGI 9, 2021]

Finally, FGI 11 had this to say:

> *"...Free-hand is suitable for uneducated dressmakers/ tailors.....pattern is a little difficult to learn but I think it is accurate as compared to the free-hand cutting technique.....She said*"

The participants concluded that person who wish to learn how to sew whether educated or non-educated should learn pattern and free-hand cutting for a broader knowledge. Most dressmakers and tailors had little or no knowledge about pattern use in garment construction. Hence it uses for cutting out was not common among the dressmakers/tailors during the focused group interview. Some portion of the participants who had little knowledge on pattern, perceived pattern as difficult and time consuming and therefore prefer to use free-hand cutting technique for garment construction.

4.9 Evaluation of Garment using Free-hand Cutting and Patterns

For the observation, three fashion lecturers at Sunyani Technical University were contacted to be the Judges. These judges were purposively selected because they are professionals and experience in the fashion industry. In addition, two fashion designers and two dressmakers who are professionals in the fashion industry were selected to construct garment with Free-hand cutting and pattern. These designers

were conveniently selected to construct Princess Line Dress, Roll Collar Blouse, and Bra cap blouse using free-hand cutting and pattern.

An observation was undertaken to check the strength and weakness of free-hand cutting and patterns used in garment construction. The study assessed the fit of three garments sewn (i.e. Princess Line Dress, Roll Collar Blouse, and Bra cap blouse) using free-hand cutting and pattern techniques. Through the researcher's observation, many clients complaint about fit problems of these designs. The researcher's deemed it necessary to use Princess Line Dress, Roll Collar Blouse, and Bra cap blouse as indicators. The fitness of Princess Line Dress was assessed on the neckline, shoulder, bust, waist, nape to waist, panel lines, hips, dress length, sagging at the back, sleeve length, sleeve bicep (around arm), arm scye (Armhole), and style drape. The Roll Collar Blouse was evaluated on the neckline, shoulder, roll line, break point, break line, style line, and fall. However, the bra cap blouse was assessed on the neckline, bust, bra cap size, and the bra cap appearance.

4.9.1 Evaluation of Fit of Princess Line Dress by Judges

On the day of 21st March, 2021, the four (4) princess line dresses; 2 made with each technique was evaluated. The dresses were labelled: "Princess Line Dress Free-hand (PLDF 1 and PLDF 2)" for free-hand cutting and "Princess Line Dress Pattern (PLDP1 and PLDP2)" for the pattern. Plate 4.1 and 4.2 shows the two dresses constructed with free-hand cutting, and plate 4.3 and 4.4 shows the two dresses constructed with pattern.

Back view-free-hand cutting (1) **Front view-free-hand cutting (1)**

Plate 4. 1: Princess Line Dress Constructed with Free-hand Cutting (PLDF1)

Source: Researcher field work, 2021

Back view-free-hand cutting (2) **Front view-free-hand cutting (2)**

Plate 4. 2: Princess Line Dress Constructed with Free-hand Cutting (PLDF2)

Source: Researcher field work, 2021

Back view-pattern(1) **Front view-pattern (1)**

Plate 4. 3: Princess Line Dress Constructed with Patterns (PLDP1)

Source: Researcher field work, 2021

Back view-pattern (2) **Front view-pattern (2)**

Plate 4. 4: Princess Line Dress Constructed with Pattern (PLDP2)

Source: Researcher field work, 2021

An observation by the three judges on Princess Line Dresses revealed that neckline, shoulder, bust, waist, nape to waist, panel lines, hips, dress length, sleeve length, sleeve, and bicep (around arm) fitted better with the dresses constructed using pattern than free-hand cutting method. The judge 1 and 2 reported that the arm scye (Armhole) of the Princess Line Dresses (PLDF 1 and PLDF 2) made with the free-hand cutting was too big which created excess folds around the front and back arm scye. All the three judges also indicated that there was sagging at the back of the two dresses constructed with free-hand cutting method. It was revealed that the use of pattern brought the outstanding features in the areas such as; the waist, panel lines, hips, dress length, sleeve length, sleeve, and bicep (around arm) of the dress as compared to the dress constructed with free-hand cutting.

According to the findings, there were inconsistencies in some of the selected fit parameters, but these parameters were well achieved using pattern. It was also discovered that the two (2) Princess Line Dresses constructed with pattern fits better. On the other hand, the neckline, waist, dress length of the Princess Line Dress constructed with free-hand cutting according the Judge 1 had no fit problem. From Judge 2, the neckline, sleeve length, sleeve bicep of the Princess Line Dress also had no fit problem. Moreover, Judge 3 indicated that the neckline, bust, and sleeve bicep of the Princess Line Dress constructed with free-hand cutting had no fit problem. This implies that garment constructed with free-hand cutting had some good features in fit points such as the bust, full length and the sleeve length. The researcher is of the view that, the dresses constructed with free- hand cutting has the panel lines too close to the side seams which affected the fit of the dresses. Also, the dress two (PLDF 2) of the free-hand cutting method did not drape well. The dresses constructed with patterns fit better as compared to the free-hand cutting method.

4.9.2 Evaluation of Fit of Roll Collar Blouse by Judges

The fit of Roll Collar Blouses constructed using free-hand cutting and pattern was assessed. Four (4) Roll Collar Blouses; 2 from each technique were constructed. Plate 4.5 and Plate 4.6 show the Roll Collar Blouses constructed with free-hand cutting (RCBF), while Plate 4.7 and Plate 4.8 depict the Roll Collar Blouse constructed with pattern (RCBP).

Back view-free-hand cutting (1) **Front view-free-hand cutting (1)**

Plate 4. 5: Roll Collar Blouses Constructed with Free-hand Cutting (RCBF1)
Source: Researcher field work, 2021

Back view- free-hand cutting (2)

Front view- free-hand cutting (2)

Plate 4. 6: Roll Collar Blouses Constructed with Free-hand Cutting (RCBF2)

Source: Researcher field work, 2021

Back view-pattern (1)

Front view-pattern (1)

Plate 4. 7: Roll Collar Blouses Constructed with Pattern (RCBP1)

Source: Researcher field work, 2021

Back view-pattern (2) **Front view-pattern (2)**

Plate 4. 8: Roll Collar Blouses Constructed with Pattern (RCBP2)
Source: Researcher field work, 2021

An observation revealed that the use of patterns could make the Roll Collar Blouse fit better as compared to free-hand cutting. When the three (3) judges evaluated the pattern Roll Collar Blouses they agreed that the neckline and shoulder fitted better, whereas the roll line, breakpoint, break line, style line, and the fall was standard as compared to free-hand cutting.

The results from the Judge 1 revealed that the shoulder of all the two Roll Collar Blouses made with free-hand cutting was too close to the neck, whereas the roll line, break point, break line, style line were normal. According to Judge 2, the shoulder of the two Roll Collar Blouse constructed with free-hand cutting was too close to the neck and the neckline of the second Roll Collar Blouse (RCBF 2) was too deep. Judge 2 further indicated that roll line, break point, break line, and the style line of the second Roll Collar Blouse (RCBF 2) constructed with free-hand cutting was not up to standard. From the Judge 3, the shoulders of the Roll Collar Blouses were too close to the neck and the neckline of the second Roll Collar Blouse was too deep. In addition, the Judge 3 discovered that the roll line, break line, and style line of the

Roll Collar Blouses made with the two free-hand cutting dresses were not up to standard. All the three Judges indicated that the first Roll Collar Blouse constructed with free-hand cutting has no roll at the back neckline.

All the judges scored high marks for the Roll Collar Blouses constructed by the use of pattern. Most of the areas of Roll Collar Blouses made by the pattern technique was accepted as having a better fit and standard though there were some few areas such as the shoulder of the second Roll Collar Blouse (RCBP 2). The Judge 3 indicated that it was too close to the neck. Many fit points of Roll Collar Blouses constructed using the free-hand cutting method did not meet the standard requirements. The use of pattern method during construction contributed to appreciable fit as observed in this study. The researcher is of the view that, though the pattern Roll Collar Blouses fit better, the first blouse (RCBP 1) roll at the back neckline was too wide. Also, the first blouse (RCBF 1) constructed with free-hand cutting method has the style line too wide. On the other hand, the second blouse (RCBF 2) made with the free-hand cutting has the style line too small.

4.9.3 Evaluation of Bra Cap Blouse by Judges

The last garment considered for evaluation on fit was Bra Cap blouse. Four (4) Bra cap blouses; 2 from each technique were constructed. The evaluation was focused on the areas such as the neckline, bust, bra cap size, and the bra cap appearance were compared using bra cap blouses made with pattern and free-hand cutting methods. Plate 4.9 and Plate 4.10 show the Bra Cap Blouses constructed with free-hand cutting (BCBF), while Plate 4.11 and Plate 4.12 depicts the Bra Cap Blouses constructed with pattern (BCBP).

Back view-free-hand cutting (1) **Front view-free-hand cutting (1)**

Plate 4. 9: Bra Cap Blouses Constructed with Free-hand Cutting (BCBF1)

Source: Researcher field work, 2021

Back view-free-hand cutting (2) **Front view-free-hand cutting (2)**

Plate 4. 10: Bra Cap Blouses Constructed with free-hand Cutting (BCBF2)

Source: Researcher field work, 2021

Back view-pattern (1) **Front view-pattern (1)**

Plate 4. 11: Bra Cap Blouses Constructed with Patterns (BCBP1)

Source: Researcher field work, 2021

Back view-pattern (2) **Front view-pattern (2)**

Plate 4. 12: Bra Cap Blouses Constructed with Pattern (BCBP2)

Source: Researcher field work, 2021

An observation revealed that the pattern bra cap blouses had its neckline, bust, cap size and cap appearance free from fitting problems. The free-hand cutting bra cap blouse on the other hand, had its bust, bra cap size and cap appearance had fitting problems. As indicated by Judge 1, the neckline was too high, bust was too tight, bra cap size was too small and the cap appearance was too flattened for bra cap blouse constructed with free-hand cutting (BCBF 1). The Judge 1 further reported that the bra cap blouse points considered for evaluation made with patterns had no problems with the fit points in terms of neckline, bust, cap size and cap appearance (BCBP 1).

Further check on bra cap blouse points such as the neckline was too high, bust was too loose, bra cap size was too small and the bra cap appearance was too flattened (BCBF 2) constructed with free-hand cutting by Judge 2. It was noted that the Judge 2 recorded neckline of the first bra cap blouse (BCBP 1) constructed with free-hand cutting had no problem with fit points but the second bra cap blouses constructed with free-hand cutting (BCBF 2) has fitting problems.

The results from the Judge 3 revealed that the bust of the first bra cap blouses (BCBF 1) constructed with free-hand cutting (Plate 4.9) was too tight, cap size was too small and cap appearance was too flattened. Judge 3 further reported that the second bra cap blouses (BCBF 2) constructed with free-hand cutting (Plate 4.10) was oversized. All the three judges stated that free-hand cutting method for the second bra cap (BCBF 2) was not interpreted well. On the other hand, the Judge 3 further indicated that the areas such as the neckline, bust, bra cap size, and the bra cap appearance of bra cap blouses constructed with pattern had no fitting problems. However, all the Judges concluded that the bra cap blouse made with pattern fits better in terms of neckline, bust, bra cap size and bra cap appearance as compared to free-hand cutting. The researcher is of the view that, there were too many folds at the

back of the first Bra Cap Blouse (BCBF 1) constructed with free-hand cutting and also the bra cap size was too small. The second free-hand cutting Bra Cap Blouse (BCBF 2) was too big and the style line was not correct. The two bra cap blouses made from pattern fitted well.

Consideration the construction of Princess Line Dress, Roll Collar Blouse, and Bra cap blouse, the use of patterns makes the dresses fit better as compared to free-hand cutting. The dresses constructed with free-hand cutting has some fit points problems, i.e. either too loose or too close which affected the fit of the dresses. The use of pattern in the construction of the dresses helps to identify certain faults that might arise on the design and seek to adapt remedies to the problem before construction.

CHAPTER FIVE

DISCUSSION OF RESULTS

5.1 Introduction

This chapter discusses the major findings that emerged from the study. The discussions were carried out with the objectives and research questions set out in chapter one as the basis. For in-depth understanding, the discussions on the findings from the current study were linked to the related literature.

5.2 Effect of Free-hand cutting on Finished Garment

The study found that with free-hand cutting method, garment look elegant on the body, brings out the good style in garment, provides special features to garment, right side and wrong side appearance of garment appeal to the user, facilitates variations of styles, and allow more room for future modification of style. However, the views of the dressmakers, tailors, fashion students, and fashion designers were significantly different from each other. The results from the questionnaire were consistent with the focused group interview that "free-hand cutting gives good result and presents nice outlook of final garment constructed". The focused group interview revealed that free-hand cutting is easy, saves time, money and give good fitting, and when the dressmaker/tailor is good at it brings out the good style in garment and garment look elegant on the body. The finding agrees with the study conducted by Efajemue and Lily (2011) who found that free-hand cutting makes the whole process quicker and faster, and the dressmaker does not have to brainstorm through all the technicalities that comes with pattern. The use of free-hand cutting brings out the good style and provides special features to garment. According to Gizeski (2009)

employing free-hand cutting consumes less time in the process of constructing a garment. The use of free-hand cutting may facilitates variations of styles, and allow more room for future modification of style. Free-hand cutting involves garment construction without the use of a commercial pattern and it brings out the good style in garment and allow more room for future modification of style. Bakker-Edoh (2018) on the same issue mentioned that any types of garments worn these days are usually made from free-hand cutting and these garments look elegant on the wearer.

The view of the respondents contradicts with the study by Obinnim and Pongo (2015) that the use of free-hand cutting does not involve much precision, science and formal education and also, they do not put much emphasis on measurements and steps taken in measurements which leads to poor construction of garment. A study by Foster and Ampong (2012) indicated that garment made by free-hand cutting will not appeal nice to the wearer and also sometimes fabrics are wasted ending up rejecting the final garment by the client leading to negative cost implication. Bakker-Edoh (2018) also affirmed that the level of dissatisfaction with style modification of garment by clients of informal dressmakers, tailors and apprentices has increased. Boakye (2010) revealed that clients prefer ready-to-wear clothes due to the poor finished garment produced by dressmakers and tailors that use free-hand. This has made the budget for clothing in some cases increase for individuals as a result of fabric wastage or increase in cost when patterns are used.

The finding also opposes the study by Efajemue and Lily (2011) which compared the fit of a shoulder, sleeve and bust of a gown sewn by pattern and free-hand cutting in Nigeria. The same study also revealed that most informal dressmakers and tailors are not aware of the inaccuracy of garment sewn with the free-hand method. As a result, they prefer free-hand cutting to other sewing method which

seems to them faster, but sometimes pose a lot of problems in terms of fit, provides no special feature or variable of style for their clients when the garment is made.

The researcher is of the opinion that employing free-hand cutting consumes less time in the process of constructing a garment and that it facilitates variations of styles, and allow more room for future modification of style.

5.3 Effect of the use of Patterns on Finished Garment

The finding showed that garment made with pattern brings out the original style, promotes variations of styles, fits well on the body, gives special features to garment, look outstanding on the body, and makes the garment unique. Also, it appears that with the use of pattern, the right side and wrong side appearance of garment looks nice, garment look elegant on the body, and makes the wearer feel more comfortable than any other method. This implies that pattern gives the finished garment a tinge of professional touch. The finding from the focused group interview shows that pattern was not common among the dressmakers/tailors and some portion of the participants who had little knowledge perceived pattern as difficult and time consuming and therefore prefer to use free-hand cutting technique for garment construction.

The finding aligns with the study by Joseph-Armstrong (2010) who indicated that patterns used in garment construction bring out the good style of the garment and makes it fit better. The finding on the use of pattern in producing garment concurs with the assertion by MacDonald (2010) that when patterns are used in garment construction, it promotes variations of styles look outstanding on the body, and makes the garment unique and makes the garment fit well on the body. Pattern has the ability of restyling old patterns as well as out of date clothing into fashionable ones to suit

the demand of the time and also makes the right side and wrong side appearance of garment looks nice on the wearer (Larbi & Atta, 2009). The finding of Tamakloe (2011) outlined that pattern makes garment look elegant on the body, and makes the wearer feel more comfortable than any other method. Tamakloe further asserted that pattern helps to identify certain faults that might arise on the design and seek to adapt remedies to the problem before construction.

The finding was consistent with the studies of Effajemue and Lilly (2012) and Obinim and Pongo (2015) who asserted that the use of pattern in garment construction gives a better finishing of the garment. The garment made with pattern look elegant on the body, and makes the wearer feel more comfortable than any other method. On the other hand, Steele (2008) noted that the use of patterns gives special features to garments, makes the garment unique, makes the wearer feel more comfortable, and it possible to fit the body well, especially the male body, without resorting to custom-made clothing. Kiron (2016) also indicated that patterns are needed in dress-making in order to obtain a better fit and to save fabric.

The findings buttress with the study conducted by Aldrich (2014) that pattern making is based on basic patterns with standard measurements but when employed in designing garment it brings out the variations of styles, gives special features to garment, look outstanding on the body, and increase garment fitting. Anikweze (2013) added that pattern has several advantages which include the ability to design patterns to fit into economical fabric layouts, the possibility of restyling old patterns and out-of-date clothing into new ones, promotes variations of styles, and gives special features to garment. It also ensures ease in determining causes of mistakes during the making of the pattern and how to correct them.

This implies that with the use of pattern on garment construction it helps in getting the best outcomes in the finest possible way, brings out better garment fit, gives modification of styles and serves clients better. With this, the dressmakers and tailors should incorporate pattern in the construction of garments for their clients.

5.4 Effect of Fitting of Free-hand Cutting and Patterns on Finished Garment

The study revealed that garment made with pattern fits better on the bust, arm, hip, shoulder, waist and drapes well on the body than garment made with free-hand cutting. This finding agrees with the study by Shailong and Igbo (2009) who reported that most dressmaking industries in Nigeria were folding up mainly due to the use of free-hand cutting technique for constructing garment that resulted in poorly fitting of garment.The finding on pattern garment concurs with the assertion by MacDonald (2010) and Joseph-Armstrong (2010) that when patterns are used in garment construction, it helps to bring out the good style of the garment and makes it fit better as compared to free-hand cutting. According to Cizeski (2009), the unifying principle of pattern is that it fits well on the wearer and it makes the wearer look and feel wonderful in their clothes.

The finding concurs with the study conducted by Bray (2009). According to Bray, that the advantages of pattern outweigh that of free-hand cutting in the sense that the outcome of pattern making results in conformance to international designs whereas the free-hand cutting operates within the traditional settings and therefore, conforms to traditional design cues. Garment constructed with pattern fits better than garment made with free-hand cutting. Steele (2008) on the other hand noted that a system of sizes and patterns made it possible to fit the body, especially the male body, without resorting to custom-made clothing than free-hand cutting technique.

The results confirm with the fit evaluation made by the judges on the three garments constructed. An observation was undertaken to check the strength and weakness of free-hand cutting and pattern used in garment construction. The study assessed the fit of three garments sewn (i.e. of Princess Line Dresses, Roll Collar Blouses, and Bra cap blouses) using free-hand cutting and pattern technique. On the Princess Line Dresses, the judges indicated that the pattern technique brought the outstanding features in the areas such as; the waist, panel lines, hips, dress length, sleeve length, sleeve, and bicep (around arm) of the dress as compared to the dress constructed with free-hand cutting. According to the findings, there were inconsistencies in some of the selected fit parameters, but these parameters were well achieved using patterns.

An observation revealed that the use of pattern could make the Roll Collar Blouse fit better as compared to free-hand cutting. Many fit points of Roll Collar Blouses constructed using the free-hand cutting method did not meet the standard requirements. However, the judges indicated that bra cap blouses constructed with pattern had its neckline, bust, cap size and cap appearance free from fitting problems. The free-hand cutting bra cap blouse on the other hand, had its bust, bra cap size and cap appearance had fitting problem. However, all the judges concluded that the bra cap blouse made with pattern fits better in terms of neckline, bust, bra cap size and bra cap appearance as compared to free-hand cutting.

Though there were discrepancies and mismatch in most of the selected fit points, these parameters were well achieved using the pattern. This was in line with the findings of Efajemue and Lily (2011) whose study found that garment made by pattern fitted better than free-hand cutting in shoulder line, waist, panel lines, hips, dress length, sleeve length, sleeve, and bicep (around arm) of the dress. The study by

Anikweze (2012) revealed that bust, waist, hips, and back waist length of garment made with pattern fits well than the garment constructed with free-hand cutting. Anikweze pin point that clients with difficulty in getting fitting dress should probably derive the greatest benefit by making dresses patterns themselves at home, since they may not easily get their ready-to-wear garments from the shops, or from custom-made or made-to-measure garment.

The finding aligns with the study conducted by Efajemue and Lilly (2017) in Nigeria. The main purpose of this study was to analyse adult female gown made with adapted patterns and free-hand cutting. The study utilized an experimental design and thirty students were selected from the target population of 550. The findings showed that female gown made with adapted patterns fits better on the shoulder, sleeve, bust, waist, and hip than a gown made with free-hand cutting. Findings also revealed that the gown made with adapted pattern look more outstanding and dressier than the one made with free-hand cutting.

Bakker-Edoh (2018) studied the influence of pattern and free-hand cutting technique on garment fit among fashion designers in Koforidua, Ghana. Cross-section survey design was employed for the study. The total target population for the study was 843 informal dressmakers, tailors, apprentices and clients. The study makes an observation to dresses constructed with pattern and free-hand cutting. According to the study sheath dress showed that the bust, neck, waist, nape to waist and the hips fits better when constructed with pattern than free-hand cutting technique. The study indicates that the use of pattern technique brought outstanding features in areas such as shoulder line, nape to waist, dress and sleeve length, sleeve bicep and arm scye compared to free-hand cutting. With the Bustier panel blouse fitted better when constructed with pattern as compared to free-hand cutting. It was also discovered that

pattern panel long skirt dress fitted perfectly at the waist and hips as compared to the panel long skirt of free-hand which was sagging at the abdomen as a result of extra fullness. It was also revealed that the garment made with pattern produces better fit and style modification than free-hand cutting.

The implication is that fit in pattern garment is more recommended as it is likely to meet the satisfaction of both informal dressmakers and tailors and the clients. This is because if garment is ill-fitted as a result of the use of free-hand cutting method both the informal dressmaker or tailor and the clients are affected negatively. As the informal dressmaker or tailor faces a rejection of garment made and loss of clients, the clients may also incur cost of losing a fabric. There is the need to develop the potential that pattern seemed to bring into the garment construction as over-reliance on free-hand cutting could keep some dressmakers and tailors out of business with time. The researcher is of the view that making garment with appropriate method had better fit and generally more accepted by assessors compared to free-hand cutting.

5.5 Effective use of Free-hand Cutting and Patterns in Garment Construction

The results showed that garment made with both technique (i.e. free-hand cutting and pattern) have similarities to ready-made clothes, eliminate mistakes in garment construction, and have the ability of restyling old patterns. Also, it was discovered that both techniques are conveniently used for effective garment construction, saves fabric and time in garment construction. This implies that employing both technique during garment construction will give dresses a tinge of professional touch, and the process can be easily used by inexperienced dressmakers as the instructions are clearly provided. The use of patterns or free-hand cutting has its own advantages and disadvantages. While the advantages will favour garment

production, the disadvantages would constitute challenges to be overcome if both techniques are employed during garment constructions. On the advantage side, the use of both patterns and free-hand cutting saves time, saves fabrics, and eliminate mistakes in garment construction. Free-hand cutting and patterns are accurate to a point, but using both techniques help achieve perfect fit garment.

Christensen (2007) reported that good fitting is likely to be achieved by employing both techniques. If the accompanying instructions are carefully followed, the results are satisfactory. Tamakloe (2011) outlined that using both increase productivity and maximize profit and ensure business survival and growth. Larbi and Atta (2009) affirmed constructing garment with both techniques helps to identify certain faults that might arise on the design and seek to adapt remedies to the problem before construction. In contrary, the free-hand cutting skills only identify the problem through fitting after sewing which waste much time and resources.

Steele (2008) noted that the use of free-hand cutting and pattern is more possible for garment to fit the body. Dove (2016) also indicated that both techniques are needed in dress-making in order to obtain a better fit and to save fabric. Anikweze (2013) affirmed that the use of free-hand cutting and pattern making ensures ease in determining causes of mistakes during the making of the garment and how to correct them. MacDonald (2010) pinpointed that the use of both free-hand cutting and patterns in garment making bring out the good style of the garment and makes it fit better.

The researcher is of the view that employing both technique during garment construction will give the garment a professional touch. The use of both techniques helps to overcome the disadvantages of using one technique.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter describes the research's key results and the related conclusions drawn from the findings that demonstrate how the study has contributed to knowledge. It also makes recommendations based on the results and proposals for future studies.

6.2 Summary of Findings

A number of findings were made after a discussion of the responses. They are summarised as below;

6.2.1 Effect of Free-hand Cutting on Finished Garment

- The study found that with free-hand cutting method, garment looks elegant on the body, brings out the good style in garment, provides special features to garment, right side and wrong side appearance of garment appeal to the user, facilitates variations of styles, and allow more room for future modification of style.
- According to the study, the views of the dressmakers, tailors, fashion students, and fashion designers on the effect of free-hand cutting on finished garment were significantly different from each other.

6.2.2 Effect of the use of Patterns on Finished Garment

- The finding showed that garment made with pattern brings out the original style, promotes variations of styles, fits well on the body, gives special

features to garment, look outstanding on the body, and makes the garment unique.

- The study revealed that with pattern technique, the right side and wrong side appearance of garment looks nice, garment look elegant on the body, and makes the wearer feel more comfortable than any other method.
- The ANOVA analysis shows no significant difference between the views of the dressmakers, tailors, fashion students, and fashion designers on the effect of the use of patterns on finished garment.

6.2.3 Effect of Fitting of Free-hand Cutting and Pattern on Finished Garment

- The results showed that garment made with free-hand cutting only fits better on the shoulder, arm, and on the bust. However, the study revealed that garment made with pattern fits better on the bust, arm, hip, shoulder, waist and drapes well on the body. Furthermore, the study indicated that garment made with pattern fits better than garment made with free-hand cutting.
- From the observation of Princess Line Dress, the study indicated that the pattern technique brought the outstanding features in the areas such as; the waist, panel lines, hips, dress length, sleeve length, sleeve, and bicep (around arm) of the dress as compared to the dress constructed with free-hand cutting.
- Also, it was discovered that the use of pattern made the Roll Collar Blouse fit better as compared to free-hand cutting. Many fit points of Roll Collar Blouses constructed using the free-hand cutting method did not meet the standard requirements.

- The study further showed that bra cap blouses constructed with pattern fits better in terms of neckline, bust, bra cap size and bra cap appearance as compared to free-hand cutting.

6.2.4 Effective use of Free-hand Cutting and Patterns in Garment Construction

- The study showed that garment constructed with both free-hand cutting and pattern have similarities to ready-made clothes, eliminate mistakes in garment construction, and have the ability of restyling old patterns.
- The findings revealed that both techniques are conveniently used for mass garment construction, saves fabric and time in garment construction

6.3 Conclusions

As portrayed by the results of the findings, dressmakers and tailors agreed that free-hand cutting makes garment look elegant on the body, brings out the good style in garment, provides special features to garment, right side and wrong side appearance of garment appeal to the user, facilitates variations of styles, and allow more room for future modification of style. The study concluded that garment made with pattern brings out the original style, promotes variations of styles, fits well on the body, gives special features to garment, look outstanding on the body, and makes the garment unique. Also, the right side and wrong side appearance of garment constructed with pattern looks nice, elegant on the body, and makes the wearer feel more comfortable than any other method.

It was discovered that garment made with pattern fits better than garment made with free-hand cutting. The Princess Line Dress constructed with pattern technique brought the outstanding features as compared to the dress constructed with

free-hand cutting. Also, the use of patterns make the Roll Collar Blouse fit better as compared to free-hand cutting. Many fit points of Roll Collar Blouses constructed using the free-hand cutting method did not meet the standard requirements. The study further showed that bra cap blouses constructed with pattern fits better in terms of neckline, bust, bra cap size and bra cap appearance as compared to free-hand cutting.

It was also obvious from the findings that, garment constructed with both free-hand cutting and pattern have similarities to ready-made clothes, eliminate mistakes in garment construction, and have the ability of restyling old patterns. It was also apparent that dressmakers, tailors, and fashion designers both free-hand cutting and pattern can be conveniently use for mass garment construction, saves fabric and time in garment construction

6.4 Recommendations

On the evidence of the findings and conclusions achieved, the accompanying recommendations were made for the study.

- There should be an awareness programme organised by the government, quasi-governmental and non-governmental agencies to dressmakers/tailors who uses free-hand cutting to make use of patterns as well while sewing in order to produce garments that fits better.
- Ghana National Tailors and Dressmakers Association (GNTDA) should encourage and train their members on the use of pattern and this would improve and manifest in the high standard on fit of garment among the dressmakers and tailors in the informal sector in the near future.

- The informal dressmakers and tailors should incorporate pattern and draping methods of garment construction into the training of their apprentices to develop interest in the use of these methods right from the onset.
- Graduates of fashion design at the various universities in Ghana should be encouraged by the lecturers to establish industries where they can make use of patterns according to contemporary fashion in sizes for mass production.
- The study recommends the use of both free-hand cutting and pattern by the dressmakers, tailors and fashion designers in the construction of garment to contribute to perfect fit of final garment.

6.5 Suggestions for Further Research

In a study such as this, recommendations for future research would address the issues generated from this study. Based on these findings, future research may start from a relatively higher level of knowledge.

- A replication of this study would be helpful in re-examining the validity of its findings for which the researcher was not able to investigate. Further empirical studies using larger sample sizes from different and greater geographical diversity would be helpful in validating of free-hand cutting and pattern for garment construction.
- Subsequent research needs to be engaged in the development of more valid and reliable operational definitions on the tested variables and overcoming the limitations posed by the data source used in this study. In addition, more structured interviews should be conducted in different regions of Ghana, in order to continuously improve the informal dressmakers and tailors perception about pattern.

- It is important to identify and empirically evaluate the factors that potentially influence dressmakers and tailors usage of free-hand cutting.

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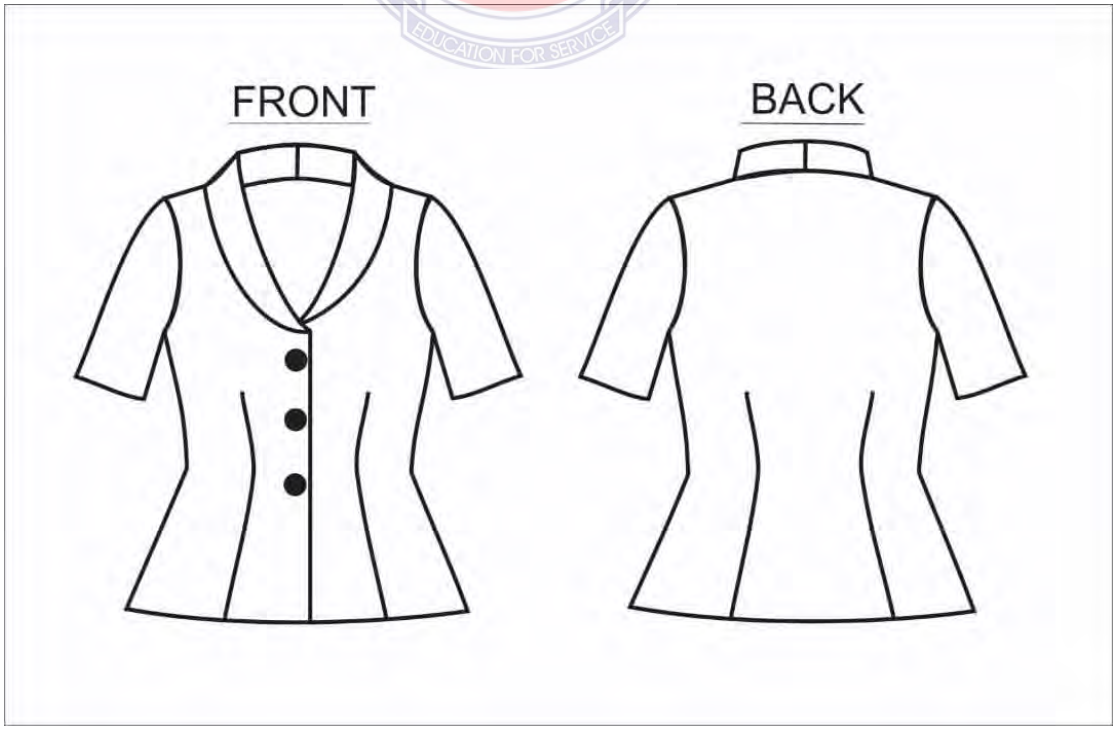
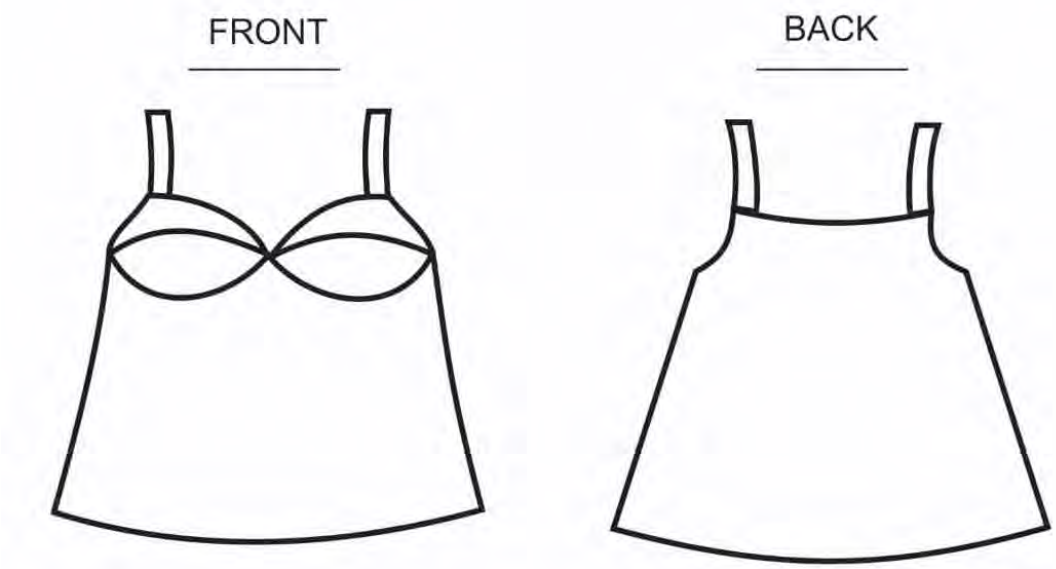
APPENDIX A

TECHNICAL DRAWINGS





APPENDIX B

UNIVERSITY OF EDUCATION, WINNEBA

COLLEGE OF TECHNOLOGY EDUCATION – KUMASI

TOPIC

COMPARING FREE-HAND CUTTING AND PATTERNS IN GARMENT INDUSTRY

PREAMBLE: The researcher, a student of the University of Education, Winneba - Kumasi Campus is seeking information relating to the abovementioned topic. The information that you are to provide is purely for an academic exercise and would be treated with necessary confidentiality. Please offer answers to all the questions in all frankness as much as possible and to the best of your knowledge. You may tick (√) where applicable or give a brief explanation where necessary.

Section A: Background Information

1. Age: 18-25 ( ) 26-35 ( ) 36-45 ( ) 46 and above ( )

2. Gender: Male ( ) Female ( )

3. What is your highest level of education?
   No formal education ( ) Primary ( ) JHS () SHS ( ) Tertiary ( )
   Others (specify): .....

4. How long have you been practicing as dressmaker/tailor or fashion designer?
   1-5years ( ) 6-10years ( ) 11-15years ( ) 15years and above ( )

5. What is your job title?
   Dressmakers ( ) Tailor ( ) Fashion student ( )Fashion designers ( )

6. Does your formal education have link with this profession?
   Yes ( ) No ( )

7. What garment construction method have you been trained to use?

Patterns () Free-handing cutting ( ) Both ( )

Section B: Effect of free-hand cutting on finished garment

8. For each of the following statements, please tick [√] the number that indicates the effect of free-hand cutting on finished garment. Using a scale from 1-5, 1=Strongly disagree, 2=Disagree, 3=uncertain, 4=Agree, 5= Strongly Agree

S/No	Effect of free-hand cutting on finished garment	SCALE				
		1	2	3	4	5
1.	Free-hand cutting contributes to perfect fit of a garment					
2.	Free-hand provides special features to garment					
3.	Garment made with free-hand cutting look elegant on the body					
4.	Free-hand cutting brings out the good style in garment					
5.	Garments made from free-hand cutting are faultless					
6.	The right side and wrong side appearance of garment made with free-hand cutting appeal to the user					
7.	Garment made from free-hand cutting makes the wearer comfortable than any other method					
8.	Skills on free-hand cutting allow more room for future modification of style					
9.	Free-hand cutting facilitates variations of styles					

Section C: Effect of the use of patterns on finished garment

9. For each of the following statements, please tick [√] the number that indicates the effect of the use of patterns on finished garment. Using a scale from 1-5, 1=Strongly disagree, 2=Disagree, 3=uncertain, 4=Agree, 5= Strongly Agree

S/No	Effect of the use of patterns	SCALE				
		1	2	3	4	5
1.	Garment made with patterns fits well on the body					
2.	Garment made with patterns looks outstanding on the body					
3.	The right side and wrong side appearance of garment made by patterns looks nice					
4.	Garment made from patterns feel more comfortable in wearing than any other method					
5.	Garment made with patterns looks elegant on the body					
6.	Patterns used in garment making bring out the original style					
7.	Patterns promotes variations of styles					
8.	The use of patterns gives special features to garment					
9.	Garment made from patterns are faultless					
10.	The use of patterns makes the garment unique					

Section D: Effect of fitting of free-hand cutting and patterns on finished garment

8.0. For each of the following statements, please tick [√] the number that indicates the effect of fitting of free-hand cutting and patterns on finished garment. Using a scale from 1-5, 1=Strongly disagree, 2=Disagree, 3=uncertain, 4=Agree, 5= Strongly Agree

S/No	Effect of fitting of free-hand cutting and patterns	SCALE				
		1	2	3	4	5
	Free-hand cutting					
1.	Garment made with free-hand cutting drapes well on the body.					
2.	Garment made with free-hand cutting fits better on the waist					
3.	Garment made with free-hand cutting fits better on the hip.					
4.	Garment made with free-hand cutting fits better on the shoulder.					
5.	The sleeve of a garment made with free-hand cutting fits better on the arm.					
6.	The garment made with free-hand cutting fits better on the bust.					
	Patterns					
7.	Garment made with patterns drapes well on the body					
8.	Garment made with patterns fits better on the waist.					
9.	Garment made with patterns fits better on the hip					
10.	Garment made with patterns fits better on the shoulder					
11.	The sleeve of a garment made with patterns fits better on the body.					
12.	Garment made with patterns fits better on the bust					

Section E: Effective use of both free-hand cutting and patterns in garment construction

10. For each of the following statements, please tick [√] the number that indicates the effective use of both free-hand cutting and patterns in garment construction. Using a scale from 1-5, 1=Strongly disagree, 2=Disagree, 3=uncertain, 4=Agree, 5= Strongly Agree

S/No	Effective use of both free-hand cutting and patterns	SCALE				
		1	2	3	4	5
1.	Garment made from both free-hand cutting and patterns have similarities to ready-made clothes					
2.	The use of both free-hand cutting and patterns saves fabric in garment construction					
3.	Free-hand cutting and patterns are both conveniently used for mass construction					
4.	The use of free-hand cutting and patterns saves time in garment construction					
5.	The use of both free-hand cutting and patterns have the ability of restyling old patterns					
6.	Free-hand cutting and patterns eliminate mistakes in garment construction					

11. In general, how would you rate the performance of garment constructed with both free-hand cutting and patterns interms of the four factors listed below?

s/no.	Factors	Poor	Good	Very good	Excellent
1.	Fit				
2.	Drape				
3.	Comfort				
4.	Personal satisfaction				

Any Addition comments:

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Thank you

UNIVERSITY OF EDUCATION, WINNEBA

COLLEGE OF TECHNOLOGY EDUCATION – KUMASI

INTERVIEW GUIDE FOR INFORMAL DRESSMAKERS AND TAILORS

TOPIC: COMPARING FREE-HAND CUTTING AND PATTERNS IN GARMENT INDUSTRY

Preamble: This interview collects data on the comparing free-hand cutting and patterns in garment industry. Your response is assured of utmost confidentiality since the result will be used only for academic purposes.

Section A: Background Information of Respondents

1. What is your gender?
2. What is your age range?
3. What is your level of education?
4. How long have you been practicing as a dressmaker, tailor or fashion designer?
5. What type of method did your master used during your training as an apprentice?

Section B: Comparing free-hand cutting and patterns in garment industry

6. What type of method are you using currently as a dressmaker, tailor or fashion designer?
7. Which garment construction method are you comfortable in using.
8. How do you see the general outlook of the final garment constructed with free-hand cutting?

9. How do you see the general outlook of the final garment constructed with patterns?
10. Comparing garment made with free-hand cutting and that of patterns, what is so unique about the two?
11. What are your general conclusions about your designs?

Thank you for your time and good information provided

UNIVERSITY OF EDUCATION, WINNEBA
COLLEGE OF TECHNOLOGY EDUCATION – KUMASI
OBSERVATION
Garment Evaluation Criterion
Checklist for Princess line dress

Fit Point	Observation	Free-hand cutting (1) Fit problem	Pattern (1) Fit problem	Remarks
Neckline	Too low			
	Too high			
	No problem on fit			
Shoulder	Too far away from neck			
	Too close to the neck			
	No Problem on fit			
Bust	Too tight			
	Too loose			
	No Problem on fit			
Waist	Waistline raised			
	Waistline dropped			
	No Problem on fit			
Nape to Waist	Too high			
	Too low			
	No Problem on fit			
Panel lines	Too far from bust point			
	No Problem on fit			
Hips	Too tight			
	Too loose			
	Not on the fullest part			
	No Problem on fit			
Dress length	Too short			
	Too long			
	No Problem on fit			
Sagging at the back	Yes			
	No			
Sleeve length	Too short			
	Too long			
	No Problem on fit			
Sleeve bicep (Around arm)	Too tight			
	Too loose			
	No Problem on fit			
Arm scye (Armhole)	Too tight			
	Too loose			
	No Problem on fit			
Style drape	No drape			
	Not fully draped			
	Fully draped			

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OBSERVATION
Garment Evaluation Criterion
Checklist for Princess line dress

Fit Point	Observation	Free-hand cutting (2) Fit problem	Pattern (2) Fit problem	Remarks
Neckline	Too low			
	Too high			
	No problem on fit			
Shoulder	Too far away from neck			
	Too close to the neck			
	No Problem on fit			
Bust	Too tight			
	Too loose			
	No Problem on fit			
Waist	Waistline raised			
	Waistline drop			
	No Problem on fit			
Nape to Waist	Too high			
	Too low			
	No Problem on fit			
Panel lines	Too far from bust point			
	No Problem on fit			
Hips	Too tight			
	Too loose			
	Not on the fullest part			
	No Problem on fit			
Dress length	Too short			
	Too long			
	No Problem on fit			
Sagging at the back	Yes			
	No			
Sleeve length	Too short			
	Too long			
	No Problem on fit			
Sleeve bicep (Around arm)	Too tight			
	Too loose			
	No Problem on fit			
Arm scye (Armhole)	Too tight			
	Too loose			
	No Problem on fit			
Style drape	No drape			
	Not fully draped			
	Fully draped			

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OBSERVATION
Garment Evaluation Criterion
Checklist for Roll collar Blouse

Fit Point	**Observation**	**Free-hand cutting (1) Fit problem**	**Pattern (1) Fit problem**	**Remarks**
Neckline	Too low			
	Too high			
	No problem on fit			
Shoulder	Too far away from neck			
	Too close to the neck			
	Too sloppy			
	No Problem on fit			
Roll line	Too low			
	Too high			
	Standard/ Normal			
Break point	Too low			
	Too high			
	Standard/ Normal			
Break line	Too straight			
	Too slanted			
	Standard/ Normal			
Style line	Too wide			
	Too small			
	Standard/ Normal			
Collar fall	Too wide			
	Too small			
	No fall			
	Standard/ Normal			

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OBSERVATION
Garment Evaluation Criterion
Checklist for Roll collar Blouse

Fit Point	**Observation**	**Free-hand cutting (2) Fit problem**	**Pattern (2) Fit problem**	**Remarks**
Neckline	Too low			
	Too high			
	No problem on fit			
Shoulder	Too far away from neck			
	Too close to the neck			
	Too sloppy			
	No Problem on fit			
Roll line	Too low			
	Too high			
	Standard/ Normal			
Break point	Too low			
	Too high			
	Standard/ Normal			
Break line	Too straight			
	Too slanted			
	Standard/ Normal			
Style line	Too wide			
	Too small			
	Standard/ Normal			
Collar Fall	Too wide			
	Too small			
	No fall			
	Standard/ Normal			

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OBSERVATION
Garment Evaluation Criterion
Checklist for Bra cap blouse

Fit Point	**Observation**	**Free-hand cutting (1) Fit problem**	**Pattern (1) Fit problem**	**Remarks**
Neckline	Too low			
	Too high			
	No problem on fit			
Bust	Too tight			
	Too loose			
	No Problem on fit			
Bra cap size	Too small			
	Too big			
	No Problem on fit			
Bra cap appearance	Too flattered			
	Too raised			
	No Problem on fit			

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OBSERVATION
Garment Evaluation Criterion
Checklist for Bra cap blouse

Fit Point	**Observation**	**Free-hand cutting (2) Fit problem**	**Pattern (2) Fit problem**	**Remarks**
Neckline	Too low			
	Too high			
	No problem on fit			
Bust	Too tight			
	Too loose			
	No Problem on fit			
Bra cap size	Too small			
	Too big			
	No Problem on fit			
Bra cap appearance	Too flattered			
	Too raised			
	No Problem on fit			

APPENDIX C

Table for determination of sample size (Source Krejcie and Morgan 1970)

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size.
S is sample size.