

**PATTERNMAKERS' PROFESSIONAL QUALIFICATION AND PATTERN
MAKING PRACTICES IN NAIROBI FASHION HOUSES, KENYA**

OTIENO VERAH ACHIENG' (B.Sc)

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**A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF
SCIENCE (FASHION DESIGN AND MARKETING) IN THE SCHOOL OF
APPLIED HUMAN SCIENCES OF KENYATTA UNIVERSITY**

NOVEMBER, 2017

DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

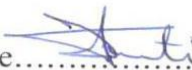
Signature.....

Date.....17/11/2017

Otieno Verah Achieng' - H60/10170/2007
Department of Fashion Design and Marketing

SUPERVISORS

We confirm that the work reported in this thesis was carried out by the candidate under our supervision.

Signature.....

Date.....17/11/2017

Dinah W. Tumuti (PhD)
Department of Fashion Design and Marketing
Kenyatta University

Signature.....

Date.....17/Nov/2017

Bosibori Oigo (PhD)
Department of Fashion Design and Marketing
Kenyatta University

DEDICATION

To my loving husband William Maganga Malalo and our blessed children Grace, Gratia, and David. Thank you all for the sacrifices you made.

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I am highly grateful to God Almighty who enabled me to successfully complete this study. Without Him and His sufficient grace my efforts would have been in vain. My most sincere gratitude goes to my supervisors Dr. Dinah W Tumuti, and Dr. Bosibori Oigo for their counsel, patience, encouragement, constructive and innumerable suggestions as well as personal interest in my progress.

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OPERATIONAL DEFINITION OF TERMS

Computer Aided Design and Drafting (CADD) is the use of computer software to come up with clothing patterns.

Custom fitted clothing are clothing made from an individual customer's specifications.

Draping is the manipulation of fabric on a three-dimensional form by a designer to obtain perfect fit and harmony between the fabric and design of the garment and silhouette of the individual.

Fashion design is an applied art dedicated to clothing and lifestyle accessories created within the cultural and social influences of a specific time.

Fashion house is a term used to refer to companies that deal in creation of exclusive custom fitted clothing. For this study they are those that participated in fashion shows in the last three years preceding the study.

Free hand cutting involves drawing the pattern direct onto the fabric based on customer measurements and cutting out along the lines drawn.

Level of experience refers to the number of years one has been practicing pattern making.

Pattern drafting is the method of obtaining patterns by drawing a shape on paper or card, and working from the measurements of the figure, according to a set of instructions. For purposes of this study, pattern drafting will also include flat patternmaking.

Patternmaker is one who takes a garment drawing or adapts patterns to create a pattern template that can be cut out on fabric and made into clothes.

Pattern making practices are the methods used to manipulate and shape a flat piece of fabric to conform to one or more curves of the human figure. They include free hand cutting, pattern drafting, draping, Computer Aided Design and Drafting (CADD) and reverse engineering.

Professional qualification is the possession of appropriate technical or business knowledge and skills, and the ability to apply it in practice. It includes one's training background and level of experience in the specific type of job.

Reverse engineering is the process of making patterns from existing garments.

Training background refers to how and where the skills, knowledge and competencies in pattern making were acquired. It includes on the job apprenticeship, government trade test, craft certificate, diploma and degree programs related to patternmaking.

Toile is a sample garment, or a prototype, made to check the fit of the pattern on the body, and how it reflects the designer's initial idea.

ACRONYMS AND ABBREVIATIONS

CAD	Computer Aided Design
CADD	Computer Aided Design and Drafting
CRPM	Centre for Research and Policy Making
CUE	Commission of University Education
FAFA	Festival for African Fashion and Arts
KICD	Kenya Institute of Curriculum Development
KNEC	Kenya National Examination Council
SPSS	Statistical Package for Social Sciences

ABSTRACT

Patternmakers are the technical backbone to the clothing manufacturing process and as such require a solid mastery of the technique. This can be ensured with proper training and experience, yet in Kenya little has been done to ascertain the levels of qualification of patternmakers in the fashion industry and whether these have any relationship with actual practices. This study adopted a descriptive research design to assess the relationship between the patternmakers' professional qualifications and pattern making practices within fashion houses in Nairobi. Specific objectives of the study were to: describe the patternmakers' demographic profile, describe the categories of clothes produced in the fashion houses, determine types of pattern making practices, assess patternmakers' professional qualification, and to establish the relationship between patternmakers' professional qualification and patternmaking practices. The study was based on a conceptual framework of education and training with labour market outcomes contextualized within fashion design. The target population was all patternmakers in the fashion houses within Nairobi. Sampling unit was one patternmaker per fashion house using criterion based sampling to reach a total of 44 patternmakers. Structured questionnaires were used to collect the data from each patternmaker. Statistical Package for Social Sciences aided in data analysis. Descriptive statistics were used to summarize variables related to demographic characteristics, categories of clothes, patternmaking practices and levels of professional qualification. Chi-square (χ^2) with an alpha level set at 0.05 was used to establish the relationship between professional qualification and the patternmaking practices. The results revealed that the majority of the patternmakers (90.9%) were below 45 years, and had tertiary education and above. Most were female (76%) and more than half of them (69.7%) were earning below 40,000 Kenya shillings per month. All of the fashion houses made dresses; pattern drafting was the most frequently used method of patternmaking, followed by freehand cutting while CADD was the least used. Majority of these patternmakers had at least a diploma or a degree. More than half of the respondents had less than 10 years of experience in patternmaking. There appeared to be a significant relationship between patternmakers' training background and use of pattern drafting method (χ^2 (8, n = 33) = 20.573, $p < 0.008$). Patternmakers with higher levels of training tended to frequently use pattern drafting. Also, there was a statistically significant relationship between patternmakers' years of experience and use of pattern drafting as a method (χ^2 (6, n = 33) = 13.265, $p = 0.039$). Majority of the patternmakers (90.9%) with less than 5 years experience frequently used pattern drafting. It was however clear that besides the training undertaken, experience had contributed more to the improvement of skills. This study therefore recommends that, men should be sensitized to take up pattern making jobs, patternmakers should be versatile enough to make a wide range of clothing, patternmakers should upgrade their knowledge in patternmaking so as to be at par with technological development, curricula developed for fashion design courses should include all pattern making methods and training opportunities should be availed to those already in the job market. For further research, it was recommended that a research should be conducted on those with several years of working experience in order to gain deeper insight into the profession, research should be conducted on patternmakers in the garment industry, the Micro and Small enterprises sector to establish their qualification and methods of patternmaking used and a similar study should be conducted in other towns outside Nairobi to provide better picture of the fashion industry in terms of patternmaking across Kenya.

CHAPTER ONE: INTRODUCTION

1.1 Background Information

Fashion house is a term used to refer to companies that deal with the creation of exclusive custom fitted clothing (Carr & Pomeroy, 1992). These are made to order for specific customers and are usually of high quality fabric and sewn with extreme attention to detail and finish. Fashion design unlike some other areas of design demands a specific framework for fashion research (Skjold ,2008). This is why according to Rust (2007), it is important that research in fashion design be rooted in the specific practice that characterize the profession.

The design process in fashion includes all facts of the process undertaken in advance of perceiving, constructing and marketing fashion (Au, 2004). The process of designing a garment often involves three major steps. First, the design which is often in form of a sketch or done by draping fabric on a model or dress stand is developed. The second step is pattern making which comes after a specific design has been established. This is done by a professional pattern maker. Finally, the finished garment is sewn in the fashion fabric (Bray, 2003).

Pattern making is one of the key areas characterizing fashion design and is a bridge between the design and final garment. Pattern making is the art of manipulating and shaping a flat piece of fabric to conform to one or more curves of the human figure (Bhati, 2016). Patterns can be made by drafting on paper, ‘free hand cutting’ (drafting directly on the fabric), modeling/draping on a body form, computer aided

design and drafting (CADD) and reverse engineering. Each pattern making method being particularly adapted to making certain types of garments.

A patternmaker creates patterns that are used to cut out fabric in order to make a complete garment. Patternmakers can work at industrial level; work with designers in fashion houses or as freelancers. Patternmakers serve as the backbone or skeleton of the fashion industry since the patterns they create are very important to produce the final garment (Fashion Schools, 2011). Pattern making in the industrial set up is a highly developed technical skill, requiring precision in the drafting and development process (Bhati, 2016). If fabric is not cut precisely, quality of finished garment can be seriously damaged resulting in great loss on the respective companies (Centre for Research and Policy Making [CRPM], 2005).

Fasanella (2005) asserts that a good patternmaker should have a solid background in designing for manufacture. Rei Kawakubo is one of the most influential fashion designers (Fury, 2017). She often gives her patternmakers written clues and instructions which they translate and make into a toile. Most often, she expects her patternmakers to bring out different design ideas out of her clues (Thurman, 2005). Patternmakers must therefore be very versatile in order to cope with the demands of their type of work.

The large number and variety of styles produced in the fashion industry; influenced by sociological, ethnic and ergonomic factors, as well as the periodic fashion changes; demands from today's designer and pattern maker a greater degree of versatility. This includes knowledge of bridal wear; bias cut garments, cowl drapery and boned

bodices, of jacket development, various trouser constructions, lingerie, beachwear and maternity wear (Stanley, 1991). Skills in patternmaking can be learnt through specialized courses or by doing an apprenticeship/on-the-job training (Pritchard, 2013). Patternmakers can take up certificate, diploma or degree courses to learn the skills.

In their study, Forster and Ampong, (2012) established a mismatch between patternmaking methods taught in Ghanaian universities and those practiced in small scale garment industries. In Kenya, some study of pattern making is included in all the fashion design courses offered at various levels. These include government trade test, artisan, craft, and diploma and degree courses. The range of skills taught at the different levels is however not all inclusive.

Isika (2014), in her study found out that real fabric draping was not prescribed in most of the curricula in Kenyan public institutions offering fashion design courses. The same study revealed that fashion designers did use real fabric draping as a patternmaking method. Her study though focused on draping as a patternmaking method, highlighted that there is a disconnect between what is taught in the institutions and what is actually in practice. A good patternmaker should be all rounded and able to use a variety of the basic patternmaking methods. This research therefore looked into the professional qualification of the patternmakers and the methods of pattern making they used.

1.2 Problem Statement

There are no strict academic requirements for entry into the pattern making profession. Patternmaking in most developed countries is highly advanced with several learning institutions offering such courses. In Kenya however, despite efforts to have both formal and vocational training in fashion design, there exists a mismatch between training and practice. There is no clear picture of the qualifications of patternmakers, the different methods practiced and why they use these methods.

New entrants in the pattern making profession may continue to struggle not knowing which patternmaking method would be economically viable or even what to expect in the labour market. Besides, institutions offering pattern making related courses may continue to provide training that is not in line with the labour market needs.

This study was therefore conducted to position some of the critical factors like training background and experience in relation to the pattern making practices. It was to establish the existing situation and identify critical points in the market value chain for appropriate interventions.

1.3 Purpose of the Study

The purpose of this study was to find out the levels of professional qualification of patternmakers and the pattern making practices as a way of assessing part of the human resource base in Kenya. Critical exploration was focused on the training background of the patternmakers, and their experience levels in relation to pattern making practices.

1.4 Objectives of the Study

The objectives of this study were:

1. To describe the demographic profile of patternmakers in Kenyan fashion houses.
2. To describe the category of clothes the fashion houses produce.
3. To determine the types of pattern making practices used in the fashion houses.
4. To assess the training background of the patternmakers.
5. To determine the level of experience of patternmakers in pattern making practices.
6. To establish the relationship between training background and experience of patternmakers and the pattern making practices used.

1.5 Research Hypotheses

The study was guided by the following hypotheses:

H₀₁ There is no significant relationship between training backgrounds and pattern making practices.

H₀₂ There is no significant relationship between levels of experience and pattern making practices.

1.6 Significance of the Study

This study sought to establish the link between patternmakers' professional qualification with pattern making practices within fashion houses in Nairobi. The findings of this study provide information which may be utilized by the Ministry of Education and Department of Gender and Youth Affairs in developing vocational training curriculum as well as revising or redesigning critical policies related to fashion industry education. The findings may provide some useful insights to guide

the Kenya Institute of Curriculum Development (KICD) in designing fashion education programs for schools and middle level colleges.

The findings may also be useful to tertiary education institutions that offer fashion design in terms of availing data on qualification levels in the market and the current status of fashion design practice. This information will be beneficial to trainers in these institutions to revise and improve their training programme. The findings have also identified the training needs that exist in the industry.

The findings have provided information on methods used in the labour market, the challenges to expect with each method, therefore new entrants in the pattern making profession can know what to expect on the job.

1.7 Limitations of the Study

This study was limited to patternmakers of fashion houses within Nairobi County; therefore, the results generated here may not be generalized to those from fashion houses in the other parts of the country. The findings can only be applicable to the study sample and to some extent patternmakers in Nairobi though with caution.

1.8 Assumption of the Study

The research assumed that:

1. The respondents would provide honest and accurate information.

2. All respondents use at least one of the known five basic pattern making practices.

1.9 Conceptual Framework

This study adopted a conceptual framework used by Walter Van Trier (2006) to evaluate transition from school to work. Patternmakers have a range of options for reaching the labour market since there are no strict academic requirements to this job. Experience is a factor that may come in at any one point. That is, one can start to have experience as early as at primary education level.

Independent Variables

Dependent Variables

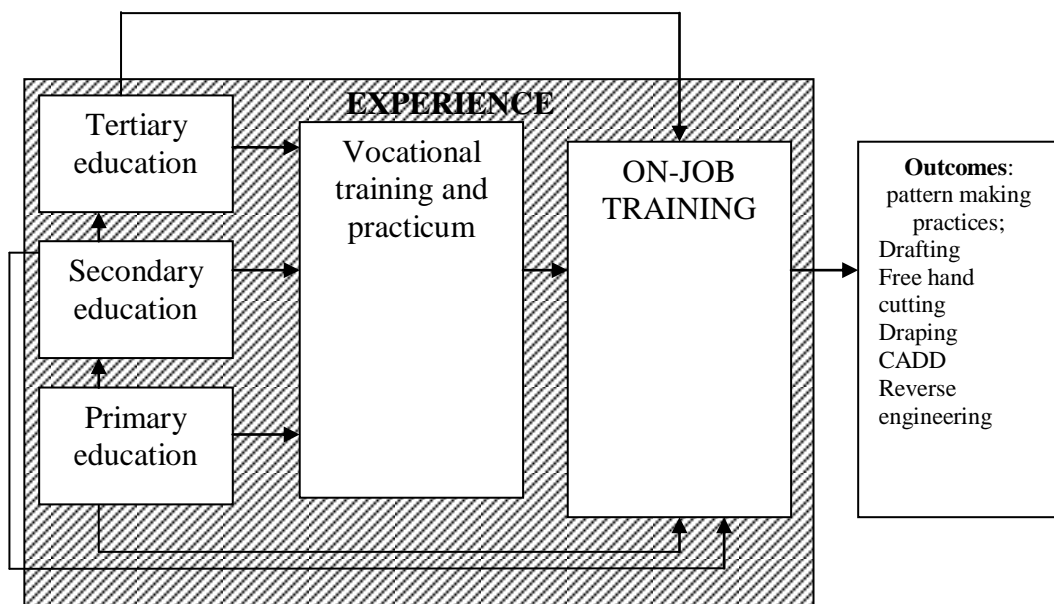


Figure 1.1: Education, training, experience and labour market outcomes in the context of fashion design.

Adapted from: Van Trier, W. (2006). *Transition from School to Work*. European Training Foundation

The difference in the various entry levels as well as years of experience may reflect on the pattern making practices. This conceptual framework allowed the explanation of

the relationships between the independent variable; training background and experience and the dependent variable which were the pattern making practices.

CHAPTER TWO: LITERATURE REVIEW

The literature review covered the following subtopics: the status of the fashion industry in Kenya, categories of fashion design, pattern making, and pattern making as a career, training for pattern making in Kenya and a summary of literature reviewed.

2.1 Status of the Fashion Industry in Kenya

The fashion industry in Kenya has been viewed as stagnant; this is partly due to the fact that many Kenyans have had the mentality that designers are expensive (Banda, 2009). Events such as Smirnoff International Fashion Design Awards and Kenya Fashion Week that previously raised the profile of designers' works in the 1990s wound up in 2004.

Nevertheless, Kenyans have become quite fashion conscious with more consumers going after more personalized designs and this calls for more professionals to meet the demands of the market. Fashion design courses are increasingly being offered at various levels. These are from the lowest government trade test, artisan, craft, ordinary diploma (Kenya National Examination Council, 2015), higher national diploma to bachelor's, masters and PhD degree levels in various institutions.

Events such as Redds Africa Fashion Design Awards and Samantha Bridal Show on Kenyan television also provide a platform for budding designers to develop their talent. According to television personality Patricia Amira, Kenyans love fashion and events such as Fashion for Peace by FAFA, are some of the local initiatives that could encourage locals as well as those in the diaspora to buy and promote local designers.

2.2 Categories of Fashion Design

There are three main categories of fashion design, although these may be split up into additional, more specific categories: (1) Mass market, which involves the production of clothes in large quantities and standard sizes for a wide range of customers. (2) Ready-to-wear clothes where designers work on garments that are sold in small numbers to guarantee exclusivity and therefore often at a high price. (3) Made to measure (Haute couture). A couture garment is made to order for an individual customer, and is usually made from high-quality, expensive fabric, sewn with extreme attention to detail and finish, often using time-consuming, hand-executed techniques (Kawamura, 2005).

2.3 Pattern Making

Pattern making is the art of manipulating and shaping a flat piece of fabric to conform to one or more curves of the human figure (Bhati, 2016). It is a bridging function between design and production. A sketch can be turned into a garment via a pattern which interprets the design in the form of garment components (Cooklin, 1997). A pattern is an original garment from which other garments of similar style are made. Patterns are made on paper or cardboard templates from which parts of the garment are traced onto fabric before cutting out and assembling. Pattern making is the art of designing patterns.

2.3.1 History of Pattern Making

For centuries, obtaining fashionable clothing that also fit properly was difficult. The wealthy hired tailors or professional dressmakers to sew custom-fit fashions. However, those of lesser means wore old clothes, makeshift fashions that were ill-fitting, or made do with re-made hand-me-downs (Alabama Chanin, 2016). Patterns have been used in constructing garments for hundreds of years. The earliest surviving pattern was made in 1580 (Steele, 2005). By 1830s, small diagrams appeared in various professional journals and womens magazines. A decade later, full size patterns as free supplements with fashion periodicals emerged in Germany and France. Demorest patterns were the first commercial patterns in the United States of America (Steele, 2005).

Pattern making is one of the earliest steps in development of a garment and a crucial step in the manufacturing process. Hence a good understanding of the various methods is important. According to Roberts & Cheung (2003), different fashion designers and pattern makers may use different approaches to reach the final garment. It is therefore necessary to begin developing types of pattern making practices to ensure accessibility to patternmakers with different ways of practicing.

2.3.2 Types of Pattern Making Practices

Competency in pattern cutting is a major factor in the production of well-fitting garments (Forster & Among, 2012). Patterns can be formed by either two dimensional or three dimensional processes. Often, a combination of methods is used to create a pattern. The most common two dimensional pattern making methods are pattern drafting, free hand cutting and reverse engineering. Pattern drafting is the

method of obtaining patterns by working from the measurements of the figure according to a set of instructions and drawing a shape on paper or card.

There are two stages in pattern drafting. These are: the making of a set of block patterns and these blocks which are in five pieces are later used for adapting to any style of garment as desired for onward transfer to the fabric, then sewing can commence (Omoavowere & Gloria, 2011). It is important to check the fit of the block patterns by making a toile for a sure fit of the adapted pieces.

Free hand cutting involves drawing the pattern based on customer measurements direct onto the fabric and cutting out along the lines drawn. This method eliminates use of a paper pattern and can result in wastage of fabric and time particularly on repeat orders.

Reverse Engineering is also known as garment deconstruction or a knock-off. In this method, patterns are made from existing garment (Bensussen, 1985). This method is used especially if one is interested in a particular design. The garment is taken apart, analyzed and pattern pieces are made (Anderson, 2005). On the other hand according to Kirke (1998) it is also possible to trace a pattern from a garment without taking it apart. Rissanen (2007) describes this as copying and has witnessed this practice occurring within the Australian designer ready-to-wear market. In some instances this practice may have merit. Vivienne Westwood states that: "By trying to copy technique, you build your own technique." (Wilcox, 2004).

In the three dimensional pattern making processes, the pattern pieces are generated from a 3D form such as a mannequin or a live model. The most common methods are, draping and Computer Aided Design and Drafting (CADD). Draping is one of the oldest methods used to generate a pattern, (Macdonald, 2009). Originally, draped clothing were not stitched or cut to fit but wrapped around the body using simple panels of cloth arranged according to the tastes and needs of the individual wearer (Boulanger, 2003).

According to Burns and Nancy (1997), in traditional draping process, a garment is produced by molding, cutting and pinning fabric to a mannequin or individual. It is a method used for more elaborate and unique designs that are hard to obtain through 2D pattern methods. This is because it is nearly impossible to account for the way a fabric will drape or hang on the body without an actual three dimensional test run.

Draping involves creating muslin mock up pattern by pinning fabric directly on a dress form, then transferring the muslin outline markings onto a paper pattern or using the muslin as the pattern itself (Amarden-Crawford, 2012). Anikweze (2012), 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.

Computers Aided Design and Drafting (CADD) is the use of computer technology for the process of drafting (Gaur, 2017). It has been used by apparel companies since the early 1980's (Cooklin, 1997). According to Anderson (2005), CADD pattern design systems have become invaluable tools to the patternmaker assisting in much of the

repetitive tasks associated with pattern making. Using a mouse or stylus, patternmakers are able to swiftly add details and make changes.

CADD software or environment provides the user with input-tools for the purpose of streamlining the drafting process. Chapman (2014) categorizes pattern making software tools into three: CAD-based software for the fashion industry. These include Gerber, Lectra, Optitex and others which are based on CAD technology. They are very specialized and costly. Another category is the scaled down CAD software for custom clothing makers which are also CAD based but with fewer options making them affordable. Some of the scaled down software are: Wild Ginger PatternMaster, PatternMaker, FashionCAD, Telestia Creator and Marvelous Designer. The third category is the vector drawing software, with this kind of software, one can freely draw patterns. It has speed, therefore is much faster than paper drafting. Some examples are Adobe Illustrator, Inkscape and CorelDraw.

Benefits of these systems include speed, accuracy, ease of data transmission and storage. The patternmaker can change the styling with ease according to their preferences, for example, adding darts and dropping necklines. Therefore, styles can be adjusted according to customer preferences and the effect seen (Volino, Cordier & Magnenathalmann, 2005).

2.4 Pattern Making as a Career.

A clothing patternmaker uses a designer's drawing to create a prototype template (Rosen, 2004). According to Fasanella (2005), patternmakers are the technical

backbone to the manufacturing process and have more control than any other single person to produce quality outcome. Therefore, a good patternmaker must have a solid background in designing for manufacture. According to the Bureau of Labor Statistics, U.S. Department of Labor (2008), there are no formal academic requirements to become a patternmaker although employers usually expect some related experience in the fashion clothing business. An apprenticeship is a common route for young people.

Mastering the different pattern cutting and grading techniques comes with experience. The combination of working alongside skilled patternmakers/graders and attending various courses can also enhance practical knowledge. City and Guilds and ABC qualifications are available in patternmaking and grading. According to Fasanella (2005), a good pattern maker should have a minimum of 24 credit hours of pattern work, 3 hours of grading, 3 hours of draping, 3 hours textile sciences, 6 hours of design development, 6 hours of production sewing methods, 3 hours of production plan and scheduling and 3 hours of advanced mathematics. Pattern making skills help the designer to observe the three-dimensional form and accurately translate that form into the two dimensional component (Kim &Uh, 2002)

2.4.1 Training for Pattern Making In Kenya.

In Kenya, though there is no specific course geared towards pattern making, some study of this is included at all levels of garment making courses. Fashion design is taught in public/ government sponsored and private institutions including, Evelyn's College of Design, Mcensal School of Fashion Design, Buruburu Institute of Fashion and Arts, Vera Beauty College, Unity College and Tijan College of Design in Mombasa. A number of the universities in Kenya also offer these courses including

Kenyatta University, Maseno University, Eldoret University and Egerton University. The Kenya Institute of Curriculum Development (KICD) has also come up with a new curriculum in Fashion Design and Garment Making Technology at levels I and II.

From the Kenya Institute Curriculum Development, the following are the courses pertaining to pattern making at level I and II: Pattern drafting I which includes an introduction to the concepts of pattern drafting, taking of body measurements, basic blocks and pattern finishing. Pattern drafting and grading II includes introduction to pattern making, tools and equipments used, finishing and storage of patterns, pattern alterations, pattern grading and copying patterns from made up garments.

A look at the Kenyatta University curriculum for fashion design reveals the following as the courses related to pattern making: pattern drafting which includes the basics of patterns that are drafting tools, body measurements, production of block patterns for men women and children, advanced skills, and knowledge in drafting tailored garments.

Pattern grading equips the students with reproduction of patterns in different sizes. Flat pattern design I and II helps in mastering the principles involved in changing block patterns to create patterns for various designs. Garment design by draping involves application of draping principles and techniques to create original garment designs.

2.5 Summary

From the literature reviewed, the following gaps were identified which the study hoped to fulfill: No research was found on the training background of pattern makers in Kenya. Neither was there literature on the levels of experience for patternmakers in Kenya. There was no all-inclusive research on the methods of patternmaking used and why these methods were most preferred.

In order to understand the labour market and to make necessary progressive changes, this research was necessary so as to avail the necessary information in regards to professional qualification of patternmakers and the patternmaking practices. This information would be beneficial to training institutions in ensuring that their training is labour market oriented.

CHAPTER THREE: METHODOLOGY

This chapter describes the research design, measurement of variables, location of the study, the target population, sample selection and sample size, explains the development of questionnaires. It elaborates on the pre-testing, how validity and reliability was ensured, the process of data collection, show how data collected was analyzed and finally the logistical and ethical considerations made.

3.1 Research Design

The study adopted a descriptive research design to establish the professional qualification and the pattern making practices among different patternmakers in Nairobi County. Descriptive researches are used in preliminary and exploratory studies to allow researchers to gather information, summarize, present and interpret for the purpose of clarification at a particular point in time (Orodho, 2005).

According to University of Southern California Libraries (2016), this method is used to obtain information concerning the current status of the phenomena and to describe what exists with respect to variables or conditions in a situation.

3.2 Measurements of Variables

Pattern making practices was the dependant variable and was polychotomus in nature. This was measured using a three point Likert scale showing the frequency of use of each pattern making practice but treating it as nominal. The respondents were asked to choose under each method either, 'frequently', 'rarely', or 'never' used. The

procedures they followed and the challenges faced with each method were also established.

The independent variables of the study were demographic characteristics of the patternmakers, categories of clothing, training background in fashion design and levels of experience in an input, through put and output format. The independent variables were categorical in nature and were measured by close ended and open-ended items and Likert scales.

The demographic characteristics were age, gender, income level and education level. The respondents were asked to tick yes or no under each category of clothes they made. The training background of the pattern makers was measured by asking them to tick from the list given, indicating the type of training they had under gone. Closed ended items indicating number of years of experience were used and the respondents were asked to tick from the list given.

3.3 The Study Area

The location of the study was Nairobi County. A large number of fashion houses exist in this city. Furthermore, areas within the city such as Hurligham, Ngong Road and Westlands host expatriates and high income earning Kenyans. Popular shopping centres including Sarit Centre and Yaya Centre are located in this area. These form a client base for the fashion houses. Purposive criterion based sampling technique was used to select Nairobi County due to the larger number of fashion houses in this area, compared to other parts of Kenya.

3.4 Target Population

Target population is the specific group with which the researcher would like to use their findings for desired purposes (Serekan, 2003). It is from this population that researchers select the sample, (Hittleman and Simon, 2006). The study target population was the patternmakers of all the fashion houses in Nairobi.

3.5 Sampling Procedures

The researcher intended to have all fashion houses in Nairobi represented in the sample. In order to establish the total number of fashion houses, the researcher drew a list from the final two consecutive years of Kenya Fashion Week (2007 and 2008), the last three years of Samantha Bridal shows (2009, 2010 and 2011) and 2008 and 2009 FAFA Fashion for Peace shows, giving a total of 20. From these fashion houses, second round of snowballing was done, giving a total of 17 other fashion houses. From the 17, a third round of snow balling was done and 7 other fashion houses were obtained. On the fourth round, there were no new entries. Therefore the researcher obtained a total number of 44 fashion houses. One pattern maker from each of the fashion houses in Nairobi was selected using criterion based purposive sampling in the case of fashion houses with more than one patternmaker, giving a total of 44 patternmakers.

3.6 Sample Size

Snowballing was used to select 44 fashion houses, randomly selecting one patternmaker from each fashion house in cases where there was more than one. A total

number of 44 patternmakers made up the sample. The sample size excluded three patternmakers who had participated in the pretesting of the questionnaire. Out of the 44 patternmakers, 33 returned fully completed questionnaires making the response rate to be 75%.

3.7 Research Instrument

Self-administered questionnaires were used to collect data. A questionnaire ensures elimination of interviewer and associated biases. The instrument consisted of both open and closed ended questions (see Appendix B). These were in line with the objectives of the study. Part One of the questionnaire covered the respondent's demographic characteristics; Part Two consisted of questions on their pattern making practices. Finally, part three sought to find out the professional qualification of the pattern makers.

3.8 Pre-testing

Pre-testing forms an important part of the research process. The questionnaires were administered to three patternmakers in selected fashion houses to determine the validity and reliability of the instrument being used. During the design and pre-test of the instrument, items were checked for consistency in the interpretation of questions, and ambiguous items eliminated, to ensure the response was sufficient in meeting the objectives of the study.

3.9 Validity and Reliability

Validity is the degree to which a test measures what it purports to be measuring (Orodho, 2009). The items in the questionnaires for the study were corrected by the researcher and invalid responses rejected. Through a pretest, feedback was provided and modifications done. In case of bias and inconsistency in the interpretation of questions the instrument were restructured accordingly to ensure content validity. This would ensure the responses are sufficient in meeting the objectives of the study and to eliminate ambiguous items. Reliability indicates the accuracy and precision of an instrument (Radhakrishna, 2007).

3.10 Data Collection Techniques

Structured questionnaires were used to collect the desired information. To ensure quick and high response rate, the researcher physically delivered questionnaires to the patternmakers and picked them up within the agreed time of the week.

3.11 Data Analysis and Presentation

Statistical Package for Social Sciences (SPSS) was used to facilitate data analysis. Descriptive statistics were used to summarize variables relating to demographic characteristics, categories of clothing, patternmaking practices, and the levels of professional qualifications and experience of the patternmakers. The open-ended questions were analyzed by identification of common themes, developing coding categories for the different themes, after which each response was labeled with a

coding category, and finally patterns and trends were identified. Data was grouped and summarized in tables, graphs and pie charts. Chi-square test of association was used at 0.05 level of significance to establish the relationship between training background, experience and the patternmaking practices (Table 3.1).

Table 3.1: Measurement of Variables

Objective	Dimensions	Measure	Scale
Demographic profile	Age	Age group they belong	Interval
	Gender	Male or female	Nominal
	Income level	Salary range per month	Interval
	Education level	Highest education level	Nominal
Categories of clothes	Clothes made	Yes/no to making range of clothes	Nominal
Patternmaking practices	Pattern drafting Free hand cutting Draping CADD Reverse engineering	Frequency of use	Likert
		How knowledgeable	Likert
		Procedures followed	Nominal
		Challenges faced	Nominal
Training Background	Highest qualification	Highest qualification in fashion design or related course	Nominal
		Subjects taught	Nominal
		Other Courses done	Nominal
		Interest in other courses	Nominal
		Was training applied	Nominal
		Skills improved with training	Nominal
Experience	Experience	Number of years worked	Interval
		Time taken patternmaking	interval
		Attributes	nominal
		Skills improved with experience	Likert
Relationship between professional qualification and patternmaking practices	χ^2 (Chi- square test of association)		

3.12 Logistical and Ethical Consideration

A research approval was sought from Kenyatta University Graduate School, and a research permit was obtained from the National Commission for Science Technology and Innovation (NACOSTI) (Appendix C) in order to adhere to research regulations and guidelines before commencement of data collection period. Verbal permission was sought from the owners of the fashion houses to allow the patternmakers to participate in the research. An introduction letter from the researcher was attached to each data collection instrument to seek for consent from each respondent (Appendix A). Anonymity was assured by concealing the names of respondents and that of the fashion houses.

CHAPTER FOUR: FINDINGS

4.1 Introduction

This chapter contains findings on patternmakers' demographic profile, categories of clothing that they make, the type of pattern making practices they used, their training background in pattern making and level of experience. Hypothesis testing was done to test the relationship between the training background, experience and the types of patternmaking practices used. The results from the open-ended questions in the questionnaire were used to obtain qualitative data to strengthen quantitative aspects. The total sample was 44 patternmakers, from whom 33 fully answered the questionnaires. This represented a response rate of 75%. This number was still considered appropriate given the exploratory nature of this study.

4.2 Demographic Profile of Patternmakers

The researcher deemed it necessary to establish the respondents' demographic profile which more often than not affects their skills as professionals. This section reveals the demographics of the respondents including age, gender, income level and education level.

4.2.1 Age

Table 4.1: Distribution of patternmakers by age

Age (years)	Frequency	Percentage
18 - 25	6	18.2
26 - 35	12	36.4
36 - 45	12	36.4
Above 45	3	9.1
Total	33	100.0

Age composition is a major structural aspect of the labour force (Lichter & Constanzo, 1987). The study sought to examine the patternmakers' age distribution. Ninety point nine percent (90.9%) of the respondents were below 45 years of age (Table 4.1).

This age distribution may denote that this segment employs a higher proportion of young people. It could also be an indication that the pattern makers quit the profession as they grow older.

4.2.2 Patternmakers' Gender

Table 4.2: Distribution of patternmakers by gender

Gender	Frequency	Percentage
Male	8	24.2
Female	25	75.8
Total	33	100.0

The study sought to examine the gender of patternmakers in the fashion houses. 75.8% of the respondents were female, while 24.2% were male (Table 4.2).

4.2.3 Income Level of Patternmakers.

Table 4.3: Distribution of patternmakers by income level

Income Level (kshs)	Frequency	Percentage
Less than 10,000	2	6.1
10,000 – 19,999	10	30.3
20,000 – 29,999	6	18.2
30,000 – 39,999	5	15.2
40,000 and above	10	30.3
Total	33	100.0

The information about the income revealed that 69.7% of the respondents had monthly income of less than Kshs 40,000 (Table 4.3).

This shows that the income levels of patternmakers are still relatively low. This could be as a result of the fact that the patternmakers in the fashion houses have different

levels of academic qualification but have the same job description. In this case remuneration is on the basis of results and not academic background. It is possible that those with lower levels of education easily accept lower pay and these trickles down to those with higher academic qualifications who are unable to bargain for higher pay due to competition.

Other income

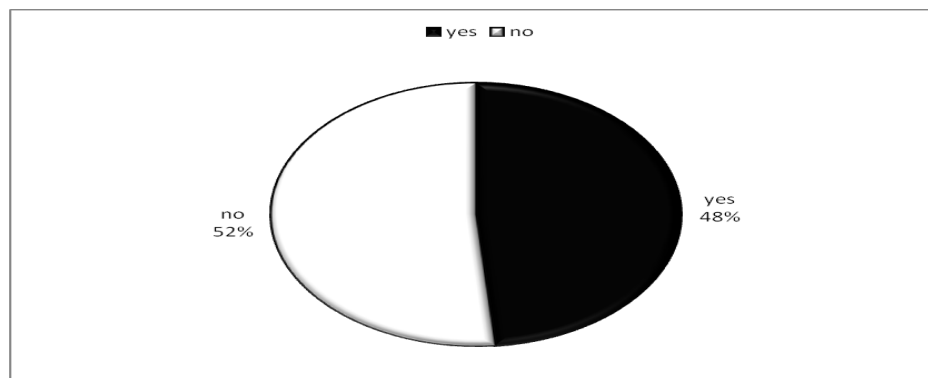


Figure 4.1: Distribution of patternmakers by other income

The study sought to establish whether the patternmakers had other sources of income. Slightly less than half (48.5 %) of the respondents had other sources of income while the remaining 51.5% indicated that they did not have other sources of income (Figure 4.1).

As observed on table 4.3 above, the patternmakers' earnings are relatively low, as a result a number of them going for other sources of income.

Patternmakers' other sources of income

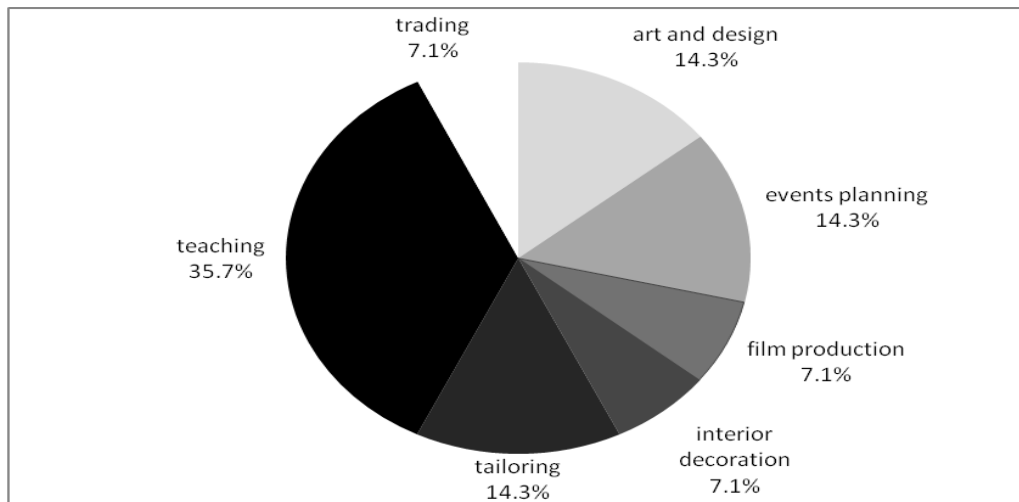


Figure 4.2: Distribution of patternmakers by other sources of income.

Other income generating activities that pattern makers were involved in included events planning, fashion design, film production, interior decoration, tailoring, teaching and trading. The highest numbers were involved in teaching as another source of income at 35.7% (Figure 4.3). The additional sources of income are mostly related to fashion design perhaps with the exception of event planning (14.3%), trading (7.1%) and film production(7.1%), all totaling to 28.5%.

4.2.4 Education Level

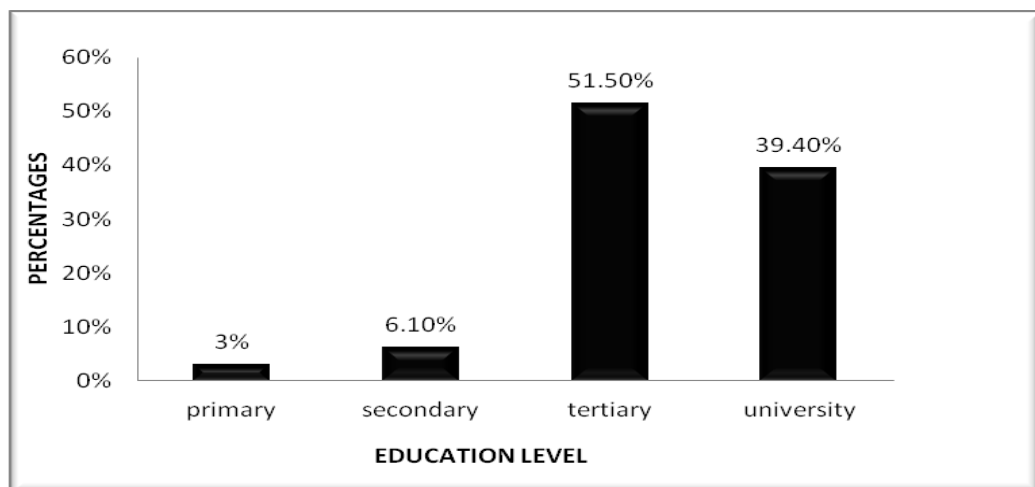


Figure 4.3: Distribution of patternmakers by education level.

The results indicate that as relates to formal education, the respondents had secondary, tertiary, as well as university education with 90.9% having had tertiary education and above (Figure 4.3).

Having all the above levels of education represented attests to the fact that there are no strict entry requirements to the patternmaking profession as regards academic background.

4.2.5 Entry into Pattern making Practice

Table 4.4: Distribution of patternmakers by when they begun practice

Begin practice	frequency	percentage
In/ after primary	2	6.1
In/ after high school	3	9.1
In tertiary college/ university	8	24.2
After tertiary college/ university	20	60.6
Total	33	100.0

The study sought to find out at what point the respondents begun their practice of patternmaking. Most of them (60.6%) begun to practice after college or university (table 4.4).

4.2.6 Source of Inspiration in Patternmaking

Table 4.5: Distribution of patternmakers by source of inspiration into patternmaking profession

Source of inspiration	frequency	percentage
Family business	2	6.1
Teacher's influence	4	12.1
Talent	5	15.2
Self interest	20	60.6
No other option	2	6.1
Total	33	100.0

A look at the source of inspiration to pursue patternmaking as a career revealed that 60.6% started as a result of self interest (Table 4.5).

4.3 Category of Clothes the Fashion Houses Produce.

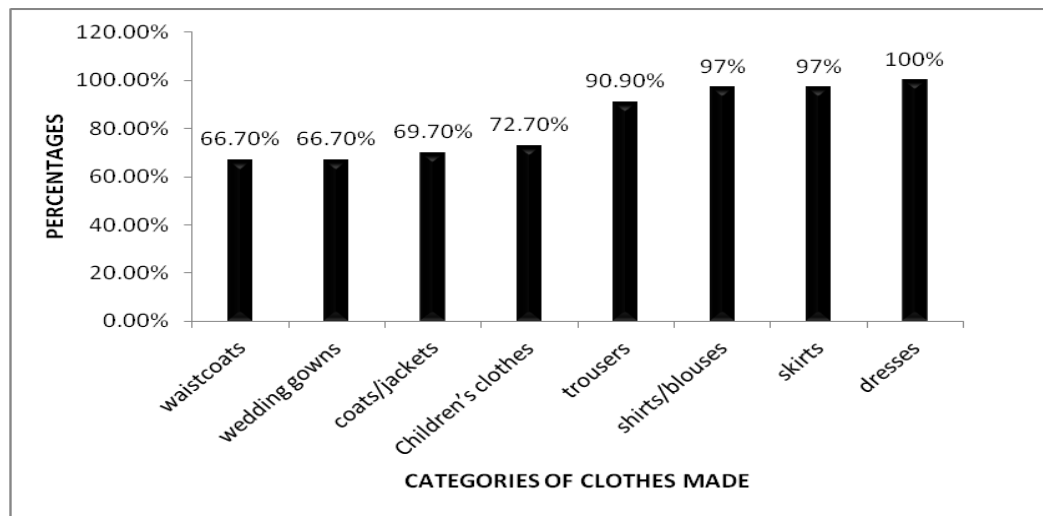


Figure 4.4: Distribution of patternmakers by categories of clothes made in the fashion houses

*Multiple responses allowed

The results indicated that the fashion houses made a variety of clothes, ranging from wedding gowns, children's clothes, to jackets, skirts and dresses. Dresses were the most popular category being made by all, 100% of the respondents, while wedding gowns and waistcoats were the least popular made by 66.7% of the respondents (Figure 4.4).

Dresses are in essence a combination of skirt and bodice in one garment. It is not surprising that all the fashion houses make dresses because perhaps it eliminates the many pieces one has to put on. It could also mean that a lot of women make dresses as such the business is worthwhile. It was important to establish the range of clothes because different types of garments are made using different pattern making methods.

4.4 Pattern Making Practices in the Fashion Houses.

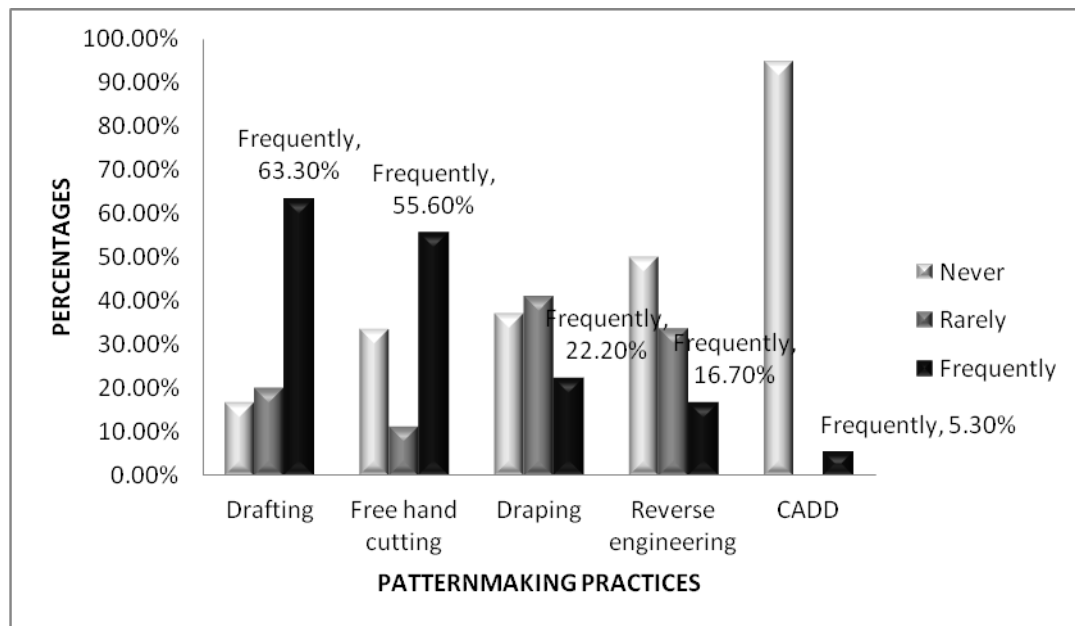


Figure 4.5: Distribution of patternmakers by frequency of use for pattern making practices

Pattern drafting ranked as the most frequently used method at 63.3%, followed closely by free hand cutting at 55.60%, while CADD method was the least frequently used at 5.3% (Figure 4.5). Pattern drafting being the most frequently used could be attributed to the high percentage of patternmakers having diplomas and degree education; since at this level, some pattern drafting is taught. CADD as a method has not been adopted yet by patternmakers and as such not in use by many as evidenced by the low percentage of use (5.3%).

4.4.1 Pattern Making Procedures used in the Fashion Houses

Table 4.6: Distribution of patternmakers by pattern making procedures

Patternmaking Procedures	Utilize	Do not utilize
Pattern drafting (n=27)		
Sketch – pattern - toile - pattern alteration- sample garment	17(63%)	10(37%)
Conceptual idea – pattern – toile – pattern alteration – sample garment	5 (18.5%)	22(81.5%)
Pattern – toile – pattern alteration – sample garment	5 (18.5%)	22(81.5%)
Freehand cutting(n=24)		
Sketch – pattern drawn on fabric – sample garment	24 (100%)	0 (0%)
Draping (n=25)		
Sketch – draping – pattern – toile – pattern alteration – sample garment	14 (56%)	11 (44%)
Draping – pattern – toile – pattern alteration – sample garment	1 (4%)	24 (96%)
Draping – toile – pattern alteration – sample garment	5 (20%)	20 (80%)
Textile print on paper – draping paper on body – pattern – toile – pattern alteration – Sample garment	0 (0%)	25 (100%)
CADD (n=2)		
Sketch by hand – pattern– toile – pattern alteration- sample garment.	1 (50%)	1 (50%)
sketch on computer - pattern– toile – pattern alteration- sample garment	1(50%)	1(50%)
Reverse engineering (n=23)		
Existing garment- sketch – pattern – toile – pattern alteration – sample garment	8 (35%)	15 (65%)
Existing garment – pattern – toile – pattern alteration – sample garment	14 (61%)	9 (39%)

Table 4.6 shows that the fashion houses used various pattern making procedures. In pattern drafting, the process of ‘Sketch – pattern - toile (trial garment) - pattern alteration- sample garment’ was the most utilized by sixty three percent (63%). All the respondents who used free hand followed the process of ‘Sketch – pattern drawn on fabric – sample garment.’ The most utilized method in draping was ‘Sketch – draping – pattern – toile – pattern alteration – sample garment’ at 56% which also had the longest steps (six). It was also observed that free hand cutting had the least number of steps (three) to arriving at the final garment whereas pattern drafting and draping had up to six steps in getting to the final garment.

4.4.2 Knowledge in Pattern Making

Knowledge in pattern making practices

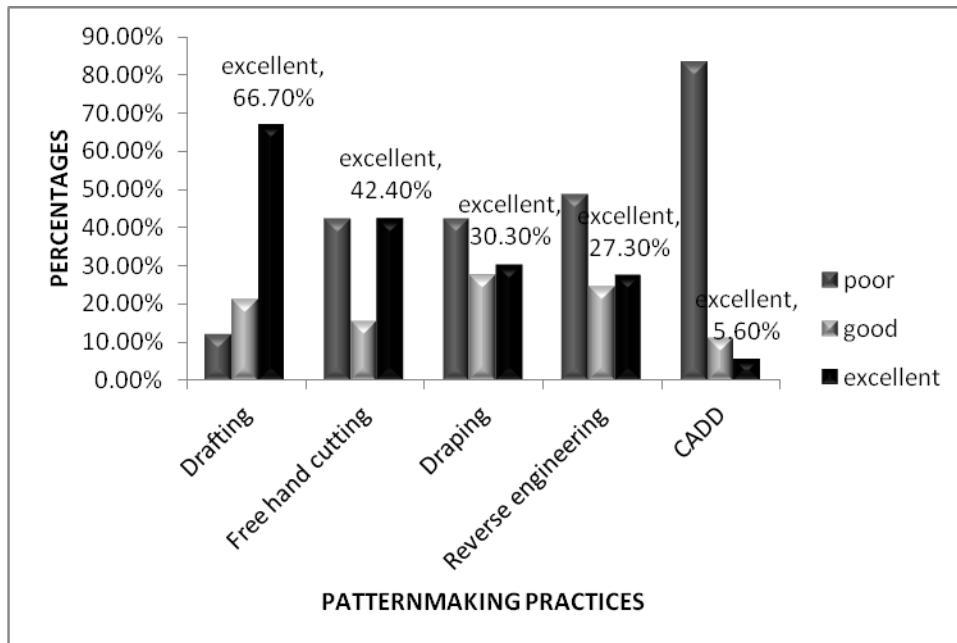


Figure 4.6: Distribution of patternmakers by how knowledgeable they are in the practice.

The study further sought to establish how knowledgeable the patternmakers were in the different pattern making methods. Most patternmakers (66.7%) indicated that they were excellent at pattern drafting while 83.3% were poor at CADD (Figure 4.6). It is clear that a big number of the pattern makers used pattern drafting often and as such have perfected the skill.

4.4.3 Challenges Experienced in Patternmaking

Table 4.7: Distribution of patternmakers by challenges experienced in patternmaking practice

Challenges experienced in practice	Frequency	Percentage
Pattern drafting n=32		
It is time consuming	24	75
Requires lots of skill	17	51.5
Its cumbersome	9	28.1
It is expensive	5	15.6
Free hand cutting n=27		
Difficulty in making complex original design	17	63
Does not give room for error	13	48.1
A style once cut leaves no record for future reference	11	40.7
Fabric wastage	10	37.0
Draping n=25		
It is a laborious process	13	52
Consumes a lot of fabric	11	44
Limited skills in draping	8	32
It is expensive	3	12
Computer Aided and Design Drafting (CADD)n=17		
Lack of skills to use the software	7	41.2
Expensive Software and hardware	6	35.3
Limited skill in CADD	6	35.3
Limited awareness of available software	5	29.4
Reverse engineering n=26		
It is a tedious process	17	65.4
It is time consuming	11	42.3
It is wasteful	2	7.7

The study sought to establish the challenges that the pattern makers experienced. The most stated challenge was related to pattern drafting. Seventy five percent (75%) indicated that pattern drafting was time consuming, sixty three percent (63%) were of the opinion that it was difficult to make complex original designs using free hand cutting. For draping, fifty two percent (52%) indicated that it was a laborious process, while around forty one percent (41.2%) indicated that they lacked skills in CADD. Sixty five percent (65.4%) were of the opinion that making patterns from an existing garment was a tedious process (Table 4.7).

Some other challenges pointed out by respondents included the fact that pattern drafting required a lot of working space. Others felt that free hand cutting was not accurate in shaping ladies' garments and does not result in perfect fit especially around the bust area and also that it requires a lot of skill. Other respondents pointed out that draping was challenging because it requires body forms which were not always available to them, and that the method was time consuming. On the other hand, CADD had not been introduced in the learning institutions that some of the respondents attended and as such they indicated that they did not have prior knowledge on it. As for reverse engineering, some felt that it was mere copying of other people's designs which limits ones designing skills and is not challenging.

4.5 Training Background of the Patternmakers.

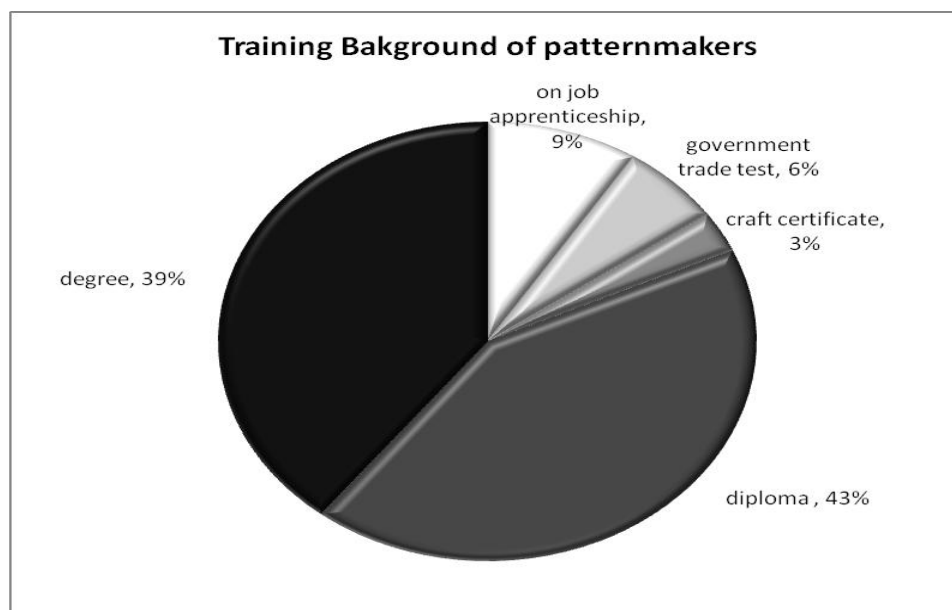


Figure 4.7: Distribution of patternmakers by training background

Overall, 81.8% of the pattern makers were trained at least up to diploma level, while those with craft certificate had the least representation at 3% (figure 4.7). This result indicates that over 80% of the patternmakers have attained higher levels of education i.e. diploma and degree.

4.5.1 Topics Covered During Training for Pattern Making.

Table 4.8: Distribution of patternmakers by topics covered during training

Topics covered	Frequency	Percentage
Body measurements	32	100.0
Pattern drafting	30	93.8
Flat pattern design	28	87.5
Patternmaking tools and equipment	27	84.4
Pattern alteration	26	81.3
Pattern grading	24	75
Garment fitting	22	68.8
Draping	19	59.4
Free hand cutting	13	40.6
Reverse engineering	7	21.9
Computer Aided Drafting (CADD)	5	15.6

Topics covered during pattern making training were important so as to give insight as to why certain pattern making methods were utilized or not utilized. Taking body measurements had been taught to all the respondents at 100% while CADD was the least taught at 15.6% (Table 4.8). Body measurements are a prerequisite for pattern making and as such it is not surprising that all had been taught how to take body measurements. It is also clear that teaching of CADD is yet to be implemented in institutions.

4.5.2 Additional Courses Done by Patternmakers.

Results indicate that 44% had done other courses related to pattern making during their years of practice while 56% had not undertaken any extra course. The details of the additional courses are shown on table 4.9.

The additional courses

Table 4.9: Distribution of patternmakers by additional courses done

Other courses done	Frequency	Percentage
Textile technology	2	15.4
Beauty therapy	1	7.7
Clothing technology	1	7.7
Craft/textile science/ modeling	1	7.7
Draping/product development	1	7.7
Education clothing technology	1	7.7
Event decoration	1	7.7
Fabric and clothing craft	1	7.7
Free hand cutting	1	7.7
Master cutting and draping	1	7.7
Soft furnishing/tie & dye	1	7.7
The design process	1	7.7
Total	13	100.0

Table 4.9 shows the list of some of the courses that the patternmakers undertook. The patternmakers did a wide range of other courses; this is an indication of how diverse the fashion field is.

4.5.3 How Often Training is Applied

The study results reveal that 87.5% of patternmakers always applied the training they had received in pattern making while 12.5% occasionally did so.

4.5.5 Interest in Other Courses Related to Patternmaking

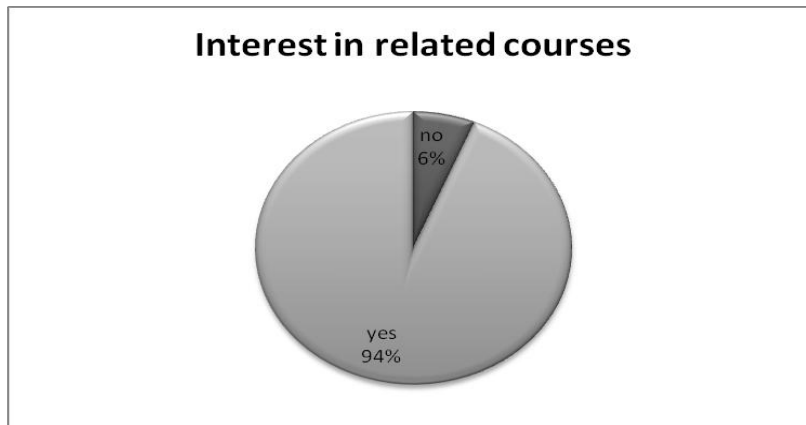


Figure 4.8: Distribution of patternmakers by interest in related courses

When asked if they were interested in pursuing other courses related to pattern making, 94% of the respondents indicated that they were interested.

Other courses of interest

Table 4.10: Distribution of patternmakers by other courses of interest

Course	Frequency	Percent
CADD	10	30.3
Fashion design	8	24.4
draping	2	6.1
Pattern grading	2	6.1
Accessories	2	6.1
Haute couture	1	3.0
Fabric manipulation	1	3.0
Advanced art of tailoring	1	3.0
Illustration	1	3.0
Fashion show production	1	3.0
Event organizing	1	3.0

Some of the courses that the patternmakers indicated they were interested in pursuing include; Computer Aided Design and Drafting 30.3%, fashion design 24.4% draping, pattern grading and other fashion related courses (Table 4.10).

4.6 Level of Experience of Patternmakers

4.6.1 Years of Experience

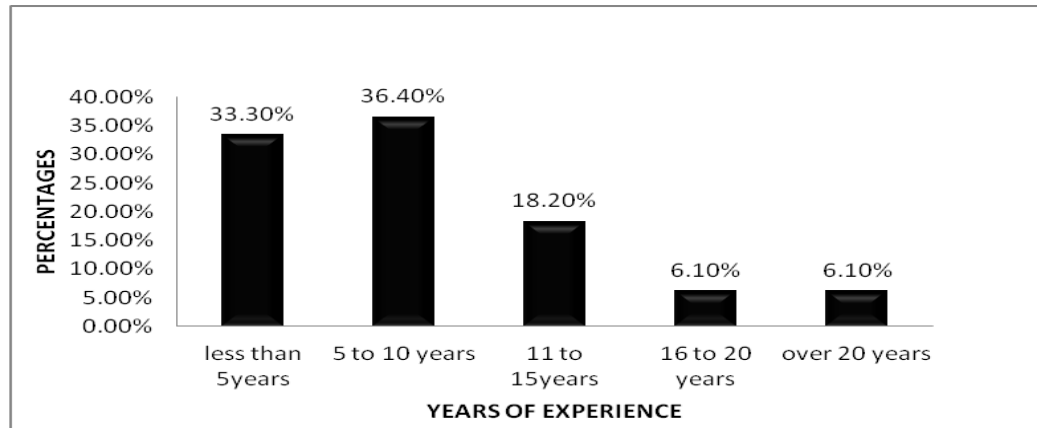


Figure 4.9: Distribution of patternmakers by years of experience

Of all the respondents, 33.3% had less than five years of experience, 36.4% had five to ten years experience, and this percentage decreases significantly with the increase in the number of years of working experience (Figure 4.9). This could be an indication that either this career is not sustainable for longer years or that many have started to embrace it recently as such the higher percentages with fewer years of experience. Equally, it is possible that those with more years of working experience may no longer be patternmakers; they may have moved on to being business owners or employers.

4.6.2 Efficiency in Pattern Making Practices

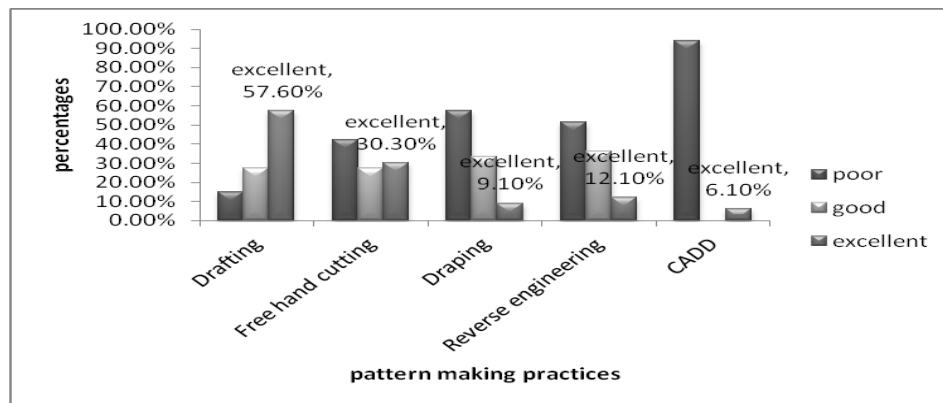


Figure 4.10: Distribution of patternmakers by level of efficiency with each method

A look at patternmakers' level of efficiency in each method revealed that fifty seven point six percent (57.6%) felt their efficiency in pattern drafting was excellent while CADD was the method they were least efficient in. Only 6.1% stated that their efficiency was excellent in CADD (Figure 4.10).

4.6.3 Time Taken Pattern Making

Table 4.11: Distribution of patternmakers by time taken patternmaking (in minutes)

Method	N	Median
Free hand cutting	16	20
CADD	1	45
Reverse engineering	13	60
pattern drafting	27	60
Draping	10	75

The results indicate that free hand cutting takes the least time, with a mean average of 20 minutes (Table 4.11). It is frequently used by 55.6% of the patternmakers. Draping takes the most time (75 minutes) and was frequently used by 22.2% of the patternmakers. Pattern drafting took three times (60 minutes) the amount of time taken for free hand cutting.

Reverse engineering took the same amount of time as drafting. CADD method was only used by one respondent.

4.6.4 Attributes of Patternmakers

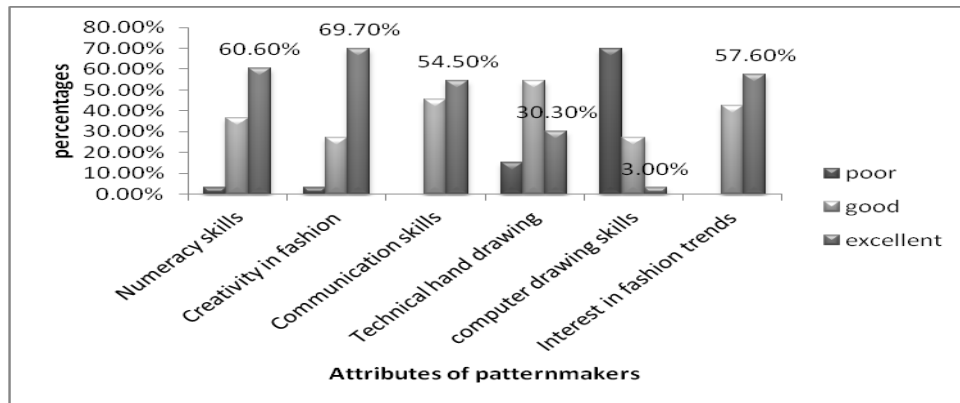


Figure 4.11: Distribution of patternmakers by attributes they possess

The results show that creativity in fashion trends and design were the attributes that 69.7% felt they were excellent at. Only three percent (3%) felt that they were excellent at technical computer drawing skills (Figure 4.11). It is clear from earlier results that CADD is the least used method and as such it is not surprising that the technical computer drawing skills are lacking amongst most of the patternmakers.

4.6.5 Experience Contribution to Skill Improvement

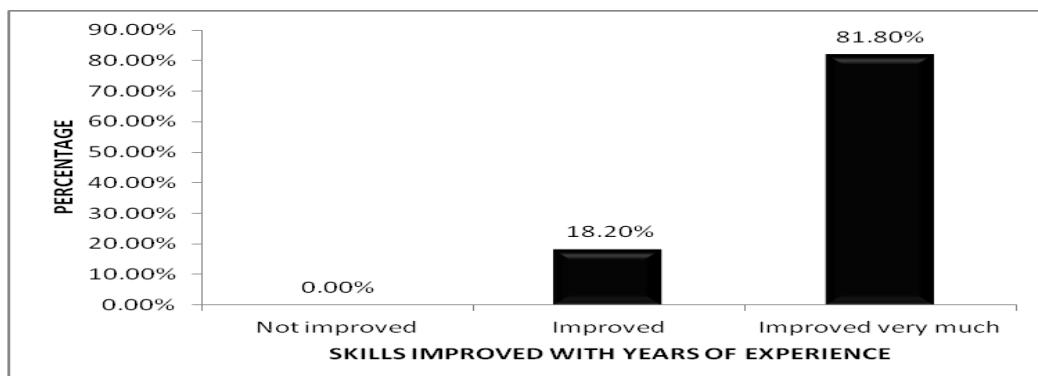


Figure 4.12: Distribution of patternmakers by skills improved with years of experience

When asked whether their skills had improved with the years of practice, 81.8% of the respondents indicated that they had improved very much, and 18.2% had just improved. It was clear that with the subsequent years of practice, all of the respondents had had some level of improvement in their skill.

4.7 Relationships between Training Background and Experience of Patternmakers and the Pattern Making Practices Used

4.7.1 Hypothesis Testing for Pattern Making Practices

The Chi-Square test of independence was used to test relationship between the variables. It was used to establish whether there was a significant difference in pattern making practices at different levels of training and experience. The null hypothesis of the independence assumption was rejected if the *P*-value was lower than the significance level of 0.05.

H₀₁ There is no significant relationship between training backgrounds and pattern making practices.

Pattern Drafting

Table 4.12: Relationship between pattern drafting and training background

Training background	Pattern drafting use (percentage)			Total
	Never	Rarely	Frequently	
On the job	66.7	33.3	0.0	100
Government trade test	100	0.0	0.0	100
Craft certificate	100	0.0	0.0	100
Diploma	0.0	15.4	84.6	100
Degree	8.3	25.0	66.7	100

(χ^2 (8, n = 33) = 20.573, $p < 0.008$) * Significant at < 0.05

Results of the Chi-Square test indicated a statistically significant relationship between patternmaker's training background and the use of pattern drafting method. The Chi – Square test results ($\chi^2 (8, n = 30) = 20.573, p < 0.008$).

The null hypothesis was rejected at level of significance of 0.008. None of the respondents with government trade test and craft certificate ever used this pattern drafting method, while 84.6% of those with a diploma frequently used pattern drafting (Table 4.12). As can be seen, those with higher levels of training tended to frequently use pattern drafting as a method, while those of lower training, rarely used this method.

Free hand cutting

Table 4.13: Relationship between free hand cutting and training background

Training background	Free hand cutting use (percentage)			Total
	Never	Rarely	Frequently	
On the job	0.0	0.0	100.0	100
Government trade test	0.0	0.0	100.0	100
Craft certificate	0.0	0.0	100.0	100
Diploma	54.5	9.1	36.4	100
Degree	27.3	18.2	54.5	100

($\chi^2 (8, n = 27) = 6.873, p = 0.550$)

Results of the Chi-Square test indicated no significant relationship between the level of patternmaker's qualification and the use of free hand cutting method. The Chi – Square test results ($\chi^2 (8, n = 33) = 6.873, p = 0.550$) show that the test was not significant ($p = 0.550$).

The null hypothesis was not rejected. All the respondents (100%) with craft certificate and below frequently used free hand cutting (Table 4.13). In comparing the diploma and degree holders, a higher number of the latter frequently used free hand cutting than the former. Although there was no statistically significant relationship between free hand method of pattern cutting and level of training, it is clear that those with lower training preferred free hand cutting.

Draping

Table 4.14: Relationship between draping and training background

Training background	Draping use (percentage)			Total
	Never	Rarely	Frequently	
On the job	66.7	33.3	0.0	100
Government trade test	100.0	0.0	0.0	100
Craft certificate	100.0	0.0	0.0	100
Diploma	18.2	54.5	27.3	100
Degree	36.4	36.4	27.3	100

(χ^2 (8, n = 33) = 6.694, p = 0.570)

Results of the Chi-Square test indicated no significant relationship between the level of patternmaker's training and the use of draping method. The Chi – Square test results (χ^2 (8, n = 33) = 6.694, p = 0.570) show the chi-square test was not significant.

The null hypothesis was not rejected. Draping was not widely used by the respondents. A small percentage of those with diploma and degree, (27.3%) in both cases frequently used draping as a method of pattern cutting. Those with government trade test and craft certificate did not use the method at all (Table 4.14). This appears to be a less popular method of pattern cutting among the respondents.

Computer Aided Design and Drafting (CADD)

Table 4.15: Relationship between CADD and training background

Training background	Computer Aided Design and Drafting use (percentage)			
	Never	Rarely	Frequently	Total
On the job	100.0	0.0	0.0	100
Government trade test	100.0	0.0	0.0	100
Craft certificate	100.0	0.0	0.0	100
Diploma	100.0	0.0	0.0	100
Degree	92.3	0.0	7.7	100

$$(\chi^2 (4, n = 33) = 1.451, p = 0.835)$$

Results of the Chi-Square test indicated no significant relationship between the level of patternmaker's qualification and the use of CADD method. The Chi – Square test results ($\chi^2 (4, n = 33) = 1.451, p = 0.835$) which show the test was not significant ($p = 0.835$).

The null hypothesis was not rejected. Only 7.7% of the respondents who had a degree qualification used CADD frequently (Table 4.15). All of those with a diploma and lower qualification never used this method at all. This is a clear indication that the adoption of CADD as a method of cutting is still very low among the fashion houses. The chi-square tests also show that there is no significant relationship between the level of qualification and the use of CADD as a method of cutting. The low percentages cannot be used to arrive at a conclusion. Most of the patternmakers indicated that they did not have enough skill in using CADD software.

Reverse engineering

Table 4.16: Relationship between reverse engineering and training background

Training background	Reverse engineering use (percentage)			Total
	Never	Rarely	Frequently	
On the job	33.3	66.7	0.0	100
Government trade test	100.0	0.0	0.0	100
Craft certificate	100.0	0.0	0.0	100
Diploma	60.0	30.0	10.0	100
Degree	33.3	33.3	33.3	100

$(\chi^2 (8, n = 33) = 6.167, p = 0.629)$

Results of the Chi-Square test indicated no significant relationship between the level of patternmaker's qualification and the use of reverse engineering method. The Chi – Square test results ($\chi^2 (8, n = 33) = 6.167, p = 0.629$) show the test was not significant (table 4.16). The null hypothesis was not rejected. None of the respondents with craft certificate and below frequently used reverse engineering as a method of pattern cutting. 33.3% of those with a degree frequently used this method, while only 10% of diploma holders frequently used the same.

H0₂ There is no significant relationship between levels of experience and pattern making practices.

The hypothesis that there is no significant relationship between levels of experience and pattern making practices was tested at 0.05 significance level. The results of the Chi-square test were as follows;

Pattern drafting

Table 4.17: Relationship between pattern drafting and years of experience

Years of experience	Pattern drafting use (percentage)			Total
	Never	Rarely	Frequently	
Less than 5 years	0.0	9.1	90.9	100
5 to 10 years	33.3	16.7	50.0	100
11 to 15 years	0.0	60.0	40.0	100
Over 15 years	50.0	0.0	50.0	100

$$(\chi^2 (6, n = 33) = 13.265, p = 0.039)$$

Results of the Chi-Square test indicated a statistically significant relationship between patternmaker's years of experience and the use of pattern drafting method. The Chi – Square test results ($\chi^2 (6, n = 33) = 13.265, p = 0.039$) show the relationship was significant. The null hypothesis was rejected at level of significance of 0.039. The results revealed that 90.9% of respondents with less than 5 years of experience frequently used pattern drafting; this percentage seems to reduce with the subsequent years of practice. At over 15 years of experience there is a balance between those who never use the method (50%) and those who frequently used the method (50%) (Table 4.17). This can be attributed to specialization at this stage, since with more experience; one easily knows what works best for them.

The higher number of respondents using pattern drafting at an early stage of their career could mean that because most are fresh from the colleges, they are more familiar with pattern drafting, a core method is taught in the institutions.

Free hand cutting

Table 4.18: Relationship between free hand cutting and years of experience

Years of experience	Free hand cutting use (percentage)			Total
	Never	Rarely	Frequently	
Less than 5 years	50.0	30.0	20.0	100
5 to 10 years	20.0	0.0	80.0	100
11 to 15 years	20.0	0.0	80.0	100
Over 15 years	50.0	0.0	50.0	100

$(\chi^2 (6, n = 33) = 10.800, p = 0.095)$

Results of the Chi-Square test indicated that there is no significant relationship between patternmaker's years of experience and the use of free hand cutting method. The Chi – Square test results ($\chi^2 (6, n = 33) = 10.800, p = 0.095$) show the relationship was not significant ($p = 0.095$).

The null hypothesis was not rejected. Only 20% of those with less than 5years of experience frequently use free hand cutting. It's important to note that this percentage increases with the subsequent years of practice (table 4.18).

Draping

Table 4.19: Relationship between draping and years of experience

Years of experience	Draping use (percentage)			Total
	Never	Rarely	Frequently	
Less than 5 years	10.0	70.0	20.0	100
5 to 10 years	50.0	30.0	20.0	100
11 to 15 years	60.0	20.0	20.0	100
Over 15 years	50.0	0.0	50.0	100

$(\chi^2 (6, n = 33) = 7.707, p = 0.260)$

Results of the Chi-Square test indicated that there is no significant relationship between patternmaker's years of experience and the use of draping method. The Chi – Square test results ($\chi^2 (6, n = 33) = 7.707, p = 0.260$) show the relationship was not significant ($p = 0.260$). The null hypothesis was not rejected. Draping is not very popular amongst the respondents with only about 20% frequently using it in each category (Table 19).

Computer Aided Design and Drafting (CADD)

Table 4.20: Relationship between CADD and years of experience

Years of experience	Computer Aided Design and Drafting use (percentage)			
	Never	Rarely	Frequently	Total
Less than 5 years	83.3	0.0	16.7	100
5 to 10 years	100.0	0.0	0.0	100
11 to 15 years	100.0	0.0	0.0	100
Over 15 years	100.0	0.0	0.0	100

($\chi^2 (3, n = 33) = 2.287, p = 0.515$)

Results of the Chi-Square test indicated that there is no significant relationship between the patternmaker's years of experience and the use of CADD. The Chi – Square test results ($\chi^2 (3, n = 33) = 2.287, p = 0.515$) show the relationship was not significant ($p = 0.515$). The null hypothesis was not rejected.

CADD is frequently used by only 16.7% of those with less than five years of experience. None of the other categories ever use CADD (table 4.20). It is clear that this is a new method that has not yet been adopted by the fashion houses.

Reverse Engineering

Table 4.21: Relationship between reverse engineering and years of experience

Years of experience	Reverse Engineering use (percentage)			Total
	Never	Rarely	Frequently	
Less than 5 years	33.3	33.3	33.3	100
5 to 10 years	44.4	44.4	11.2	100
11 to 15 years	75.0	25.0	0.0	100
Over 15 years	100.0	0.0	0.0	100

(χ^2 (6, n = 33) = 5.806, $p = 0.445$)

Results of the Chi-Square test indicated that there is no significant relationship between the patternmaker's years of experience and the use of reverse engineering method of pattern making. The Chi – Square test results (χ^2 (6, n = 33) = 5.806, $p = 0.445$) show the relationship was not significant ($p = 0.445$). The null hypothesis was not rejected.

The highest percentage (33.3%) of those with less than 5 years of experience frequently used reverse engineering. With the increase in the number of years of experience, less of the respondents used this method, with only 11.1% of those with 5-10 years' experience, using the method (Table 4.21). This can be attributed to the fact that one's skills improve with more experience and as a result, they no longer need to rip open clothes to make others.

CHAPTER FIVE: DISCUSSION OF FINDINGS

The discussions of the results were based on the findings of the study as presented in chapter four, in line with the objectives of the study (Section 1.4).

5.1 Demographic Profile of Patternmakers

The results of this study show that a majority (90.9%) of the patternmakers were below 45 years of age (Table 4.1). This could be an indication that this segment of the fashion industry employs a higher proportion of younger people. A possible explanation to this would be the fact that patternmaking is a very painstaking job and as such requires younger minds that are equally physically agile. The results further show that there are a higher percentage of female (76%) than male (24%) patternmakers in the fashion houses (Table 4.2).

In general, these findings are similar to those of The British Fashion Council that states that by breaking down the UK fashion labour force by gender, it is clear that the UK fashion industry directly employs a far higher proportion of women in comparison to the rest of the economy. Overall, they estimate that 71.6% of workers in the UK fashion industry are female; more than two in every three workers in the manufacture of clothing is female.

In an effort to explain this imbalance, Paul-Majumder and Begum (2000), in their Policy Research Paper on Gender Balance found out that some gender-specific concerns are also influential in encouraging garment employers to employ more women than men in their firms. These are as follows: (a) women are more patient and

nimble; (b) women are more controllable than men; (c) women are less mobile and less likely to join a trade union. Furthermore, Kamau (2012) found that ninety percent (90%) of the apparel design students in Kenyan public universities were female. Isika (2014) also established that 83% of Kenyan fashion design students were female whereas only 17 were male. This can be seen as a reflection of what is on ground.

Data on the income level of the patternmakers revealed that close to seventy percent (69.7%) of the patternmakers were earning below 40,000 Kenya shillings per month (table 4.3). As compared to international standards, these rates are low. According to Bureau of Labour and Statistics (2009), the mean annual wage of a patternmaker is \$45,700, which is about 300,000 Kshs per month. This cannot compare to close to 70% of the patternmakers in the sample who earn less than 40,000 Kshs per month. A possible explanation would be that the pattern making profession is not yet fully recognized as a worthy profession and as such, employers may not be willing to pay well. In addition, the fact that just about anyone with the skill, education level notwithstanding; can be a patternmaker in Kenya makes the profession very noncompetitive in terms of wages. As such, it is understandable why a number of the patternmakers choose to engage in other income generating activities (Figures 4.1 and 4.2). Some activities like film production, events planning are totally out of their area, and this can result in non-perfection of one's patternmaking skills.

The education level revealed that 90.9% of the patternmakers had tertiary education and above, while it was surprising to find a few with primary and secondary education represented in the sample. This clearly shows that there are no strict entry requirements to the pattern making profession as regards educational background. This

concur with Bureau of Labor Statistics, U.S. Department of Labor that, there are no formal academic requirements to become a pattern maker. It is however important to note that, in recent years, many organizations have realized that in order to survive in a world which is changing very fast with new technologies employee education is essential for new types of job and new forms of working which require a different combination of skills. Employee education is crucial for both the organizations and the macroeconomic performance of a nation (Bakan, 2004).

The higher percentage of respondents being at the tertiary level also clearly indicates that pattern making is being taken seriously and more people are going to college to study it. The results further revealed that a higher percentage (60.6%) of the patternmakers started practicing after graduating from college/university (Table 4.4). It is no doubt that after college, most people are ready for the job market, and the training they may have undergone at this point gives them a good basis to start work. As for the source of interest in patternmaking, it was noted that most of the patternmakers (60.6%) were in the profession out of self-interest (Table 4.5).

5.2 Categories of Clothes Made in the Fashion Houses

The study revealed that all the patternmakers in the fashion houses made dresses. Other garments made included skirts, shirts/blouses, wedding gowns, trousers and children's. It was clear that some fashion houses specialized in certain garments and hence the differing percentages of clothes made in each category (Figure 4.4). Wedding gowns and waistcoats were the least popular with a percentage of 66.7. Wedding gowns are occasional wear and it is therefore not surprising that not all

fashion houses make them. This similarly applies to waistcoats which are not a common daily wear in Kenya.

5.3 Pattern Making Practices

The results show that pattern drafting was the most frequently used method at 63.3% followed closely by free hand cutting at 55.6%, while CADD was the least frequently used at 5.3% (Figure 4.5). These results differ from those of a research conducted in Ghana by Forster and Ampong (2012) that indicated that 100% of the patternmakers used freehand cutting while only 4% of those used pattern drafting. In the same study, most of the pattern cutters even after being taught pattern drafting in school went ahead to vocational training institutes to learn free hand cutting.

In contrast, most (81.8%) of the patternmakers in Nairobi fashion houses had been through diploma and degree courses. They were more conversant with pattern drafting as that is what had been taught to them in college. The research can also not ignore the fact that free hand cutting is frequently used by more than half of the respondents (55.6%) and as such it is a method that should be given much attention even in terms of formal training. Computer Aided Design in Drafting and draping ranked very low (20% and 5.3% respectively). A possible explanation could be that very few respondents had been taught these techniques during their training (Table 4.8) with 59.4% taught draping and only 15.6% taught CADD). Isika (2014) confirms that draping design is the least popular pattern development technique taught in fashion colleges in Kenya.

Regarding the procedures used in the different methods of patternmaking, draping had the longest procedure; sketch – draping – pattern – toile – pattern alteration – sample garment. It was followed by pattern drafting, ‘sketch – pattern – toile – pattern alteration – sample garment’ which was most utilized by 63% of the respondents. On the other hand free hand cutting method only involved three steps that is, ‘sketch – pattern drawn on fabric – sample garment’ (Table 4.6). Forster and Ampong (2012) confirmed this in their study, concluding that while drafting entailed a lot of work, free hand cutting instructions were fewer and easier to commit to memory.

The patternmakers faced some challenges while using each of these methods. The respondents were of the opinion that pattern drafting was a time consuming process (75%). This concurs with Gulati et al (2009). Forster and Ampong (2012) had documented that the demonstrators complained that while using pattern drafting, they wasted too much time on the pattern work. This adversely affected their production rates and increased service charges.

On the other hand, 63% of the patternmakers in Nairobi were of the opinion that it was difficult to make complex original designs using the free hand cutting method. This inefficiency attributed to free hand cutting is clear in Forster and Ampong’s (2012) study where the demonstrators resorted to pattern drafting instead of free hand cutting whenever clients requested designs that were very complicated. Another major challenge identified by Nairobi patternmakers was that draping was a laborious process and most also stated that they did not have skills to use the CADD

software. The challenge they faced with reverse engineering (patterns from existing garments), was that it was a tedious process (Table 4.7).

5.4 Training Background of Patternmakers

The current study revealed that 81.8% of the patternmakers in the Nairobi fashion houses had at least a diploma and above. A large number had gone through training at higher level institutions. It is important to note that on job apprenticeship, government test, craft certificate all had representation in the sample (Figure 4.7). It is evident that there are no strict academic requirements to enter this profession given the disparity in training background.

In the various training institutions, body measurements were taught to all. Regarding methods taught, pattern drafting scored the highest (93.8%), followed by draping (59.4%), free hand cutting, patterns from existing garments, while CADD was the least taught (Table 4.8). It is evident that pattern drafting is a core unit in fashion design and related studies.

Aldrich (2008) indicates that beginners all over the world (be it students who are starting practical pattern drafting and cutting as part of Fashion Degree or Diploma courses, or City and Guilds Examinations) start with the use of the basic pattern draft and cutting for individual figures. This also explains the trend in methods used that had pattern drafting scoring highest, while CADD scored lowest. This finding is similar to research by Kamau (2012) where less than 10% of Kenyan fashion students rated as good, the content they had received in CADD. In the same study, the fashion lecturers also rated their exposure to CADD as poor (81%).

Another important finding to note was the fact that though free hand cutting as a subject did not score so high. It was however the second most practiced method whose possible explanation could be that free hand cutting for most people is a skill acquired on the job. Forster and Armpong (2012) in their research found out that free hand cutting was only taught as theory in Ghanaian higher institutions, while CADD was not taught but all the respondents in Forster and Armpong's study used free hand cutting.

The current study also revealed that only 44% of the respondents had studied other courses related to pattern making during their years in the practice while the rest had not. This scenario could be due to the fact that pattern making jobs can be very involving and as such not allow time for pursuit of other courses. Some of extra courses include: textile technology, modeling, draping, product development, free hand cutting, master cutting and the design process (Table 4.9). Nonetheless, majority (94%) were interested in pursuing other courses (Figure 4.8) including CADD, fashion design, draping, grading and several others (Table 4.10).

It is important to note that as today's labour market becomes more and more competitive, jobseekers will need to continually find ways to stand out from the crowd, and training is one of the ways to do so (<http://www.dol.gov/odep/topics/youth/softskills/Professionalism.pdf>). In addition, most of the patternmakers (87.5%) indicated that they always applied the training they received while the rest occasionally did so. It is therefore clear that training is vital in this profession.

5.5 Level of Experience of Patternmakers

Sixty nine point seven percent (69.7%) of the respondents had up to 10 years of experience (figure 4.9); this percentage decreases significantly with the increase in years of experience. A possible indication that the profession has only begun to be embraced or perhaps those with more years of experience are no longer pattern makers. The fact that pattern making is painstaking may result in fewer experienced people being involved as their energy levels go down. Looking at the pattern makers' efficiency revealed that 57.6% were excellent at pattern drafting (figure 4.10).

This study also revealed that free hand cutting process took the least average amount of time (20minutes), pattern drafting took three times the time taken free hand cutting (60 minutes) while draping took the longest average time, 75 minutes (table 4.11). A further look at the attributes possessed by pattern makers showed a higher percentage (69.7%) being excellent in creativity in fashion trends and design while a very low percentage (3%) were excellent at technical computer drawing skills. The lower proportion is evidence as to why CADD is less popular among the respondents. The pattern makers' skills had greatly improved with subsequent years of practice.

5.6 Relationship between Training Background and Pattern Making Practices

The results indicate that there is a relationship between training background and some methods of pattern making. From the results, there is a relationship between training background and pattern drafting method ($\chi^2 (8, N = 33) = 20.573, p < 0.008$).

It was clear that those with diploma and higher, frequently used pattern drafting while those with craft certificate, government trade test, and on the job training

almost never used this method. This is not surprising because in Kenya, pattern drafting is taught majorly to fashion design students in institutions of higher learning while at the lower levels, it is less emphasized. Also, interesting to note was the fact that more diploma holders than degree holders used pattern drafting. A possible explanation would be the fact that degree holders are more open to new knowledge and are bold enough to try different other methods.

On the other hand, there was no significant relationship between freehand method of pattern cutting and the respondents' level of education ($\chi^2 (8, N = 33) = 6.873, p = 0.550$). It was however clear that those with lower levels of training preferred free hand cutting method. It is important to note that a higher number of degree holders frequently used free hand cutting compared to those with diplomas, although it was used to some extent at all levels of training. Forster and Ampong(2012) in their study revealed that 100% (fifty) of the respondents indicated that they used freehand cutting and 96% of these went through apprenticeship training in order to acquire the freehand cutting skills after learning pattern drafting in college.

The results also revealed that there was no significant relationship between draping method of pattern cutting and the respondents' level of education ($\chi^2 (8, N = 33) = 6.694, p = 0.570$). Only a small percentage (27.3%) of diploma and degree holders in both cases frequently used the draping method. Those with craft certificate and government trade test did not use draping method at all. Earlier, Isika (2014) found that the teacher's area of training is associated with the use of real fabric draping. Therefore, if the pattern makers are exposed to draping training, they are more likely to use it.

There was no significant relationship between CADD method of pattern cutting and the respondents' level of education, ($\chi^2 (4, N = 33) = 1.451, p = 0.835$). CADD was only used by a very small percentage of respondents (7.7%) who had a degree. All those with the other levels of education did not use this method.

Reverse engineering is a rather controversial method as it is viewed by some as 'copying'. The results in this study indicated that there was no significant relationship between training background and the use of reverse engineering, ($\chi^2 (8, N = 33) = 6.167, p = 0.629$). It is only 33% of those with degree and above who frequently used this method. However, it's a method that is used to some extent by all, save for those at government trade test. The method involves deconstructing a clothing item and using it as a pattern. As such reverse engineering may not need much of prior training but rather, the will to go through the tedious process.

5.7 Relationship Between Levels of Experience and Pattern Making Practices.

There was a significant relationship between levels of experience and pattern drafting practice, ($\chi^2 (6, N = 33) = 13.265, p = 0.039$). Results indicate that pattern drafting is practiced more frequently by those with less than 5 years of experience. This could be because most patternmakers at this point are fresh from college and tend to rely more on pattern drafting as it is what was majorly taught in the learning institutions. This percentage appears to reduce with the subsequent years of practice. It is possible that as one progresses in their career, they are prone to try out a variety of methods in order to achieve a good product and as such not limited to pattern drafting method only.

On the other hand, there was no significant relationship between levels of experience and free hand cutting, ($\chi^2 (6, N = 33) = 10.800, p = 0.095$). It was interesting to note from the study that those with more years of experience tended to use freehand cutting. Only 20% of those with less than 5 years of experience used it as a method. However, only half those with the highest level of experience used this free hand cutting.

As shown in the results (Table 4.19), there was no relationship between level of experience and use of draping as a method ($\chi^2 (6, N = 33) = 7.707, p = 0.260$). Draping was less popular among the respondents at almost all levels of experience. Important to note though was the fact that 50% of those with over 15 years of experience did use it frequently. With many years of experience, comes perfection of skill and the ability to effectively use the draping method.

From the study, there was no relationship between the level of experience and use of CADD as a method ($\chi^2 (3, N = 33) = 2.287, p = 0.515$). CADD is a method yet to be adopted, with only 16.7% of those with less than 5 years of experience using it frequently. All the rest with several years of experience never used it.

Reverse engineering use had no relationship with the level of experience ($\chi^2 (6, N = 33) = 5.806, p = 0.445$). It was frequently used by those with less than 5 years of experience and none of those with more than 10 years of experience frequently used it. It is clear that for beginners, this can be used as a method of cutting especially when one is not confident at making patterns of a certain design. After identifying a

garment of the desired design, they rip it apart and use it as a pattern. Pattern makers with up to 15 years of experience rarely used this method. This shows that though not popular, this method comes in handy once in a while for the patternmakers at different levels of experience. A chi-square test result of $p < .05$ shows that there is no relationship between levels of experience and reverse engineering as a method.

In comparing the contribution of training and experience to skill improvement, 46.9% felt that their skill had improved very much because of training, while 81.8% felt their skills had improved very much because of experience. It is therefore clear that among the pattern makers in Nairobi fashion houses, experience is a greater contributor to skill improvement. This was evidenced by the greater range of pattern making practices that the respondents with more years of experience used.

CHAPTER SIX: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary of Main Findings

This study has given an account of the qualifications of patternmakers in the fashion houses in Nairobi County and the pattern making practices they employ. The main focus was to outline pattern makers professional qualification, their pattern making practices and establish whether there is a relationship between these qualifications and the pattern making methods they used. This would give insights on the status of the pattern making labour market and guide in designing programs for colleges and schools to ensure what students are being taught prepares them for the labour market. It was hypothesized that there was no relationship between professional qualification and pattern making practices.

The study adopted a descriptive research design which involved administering questionnaires to 44 patternmakers. The variables measured were demographic characteristics of the patternmakers, categories of clothing made, pattern making practices, training background of patternmakers in fashion design and levels of experience. The findings indicated that there was a significant relationship between professional qualification and pattern drafting method; however other methods such as free hand cutting, draping, CADD and reverse engineering did not have a significant relationship with professional qualification.

The results revealed a majority (90.9%) of the patternmakers were below 45 years of age (Table 4.1). A higher percentage (76%) was female. Most (69.7%) were earning below 40,000 Kenya Shillings per month. Almost all (90.9%) had tertiary education and above, although some with only primary education (3%) were present in the

sample. Most of the respondents started pattern making after college (60.6%) and most (60.6%) joined the profession out of self-interest (Tables 4.4 and 4.5).

All (100%) of the fashion houses made dresses (Figure 4.4). A variety of other garments including skirts, shirts/blouses, wedding gowns, trousers, children's clothing were also made in the different fashion houses.

Pattern drafting was the most frequently used patternmaking method at 63.3%, followed by freehand cutting (55.6%). CADD (5.3%) was the least frequently used method (Figure 4.5). Pattern drafting involved six (6) steps while free hand only involved three (3) steps to the final garment. The pattern makers identified challenges associated with the various methods. Drafting was found to be time consuming while freehand presented difficulties in making complex original designs. Free hand was the fastest of the patternmaking methods. Draping was laborious, while CADD posed a challenge due to lack of skill. Reverse engineering was majorly described as tedious by the patternmakers.

A big percentage (81.8%) of patternmakers had at least a diploma and above. Taking of body measurements was taught to all pattern makers while pattern drafting was taught to 93.8%. Only 44% of the respondents undertook other courses during their years of practice. Most of the patternmakers (87.5%) indicated that they always applied in practice the training they had received.

Most of the respondents (69.7%) had up to 10 years of experience. The same percentage (69.7%) stated that they were excellent at creativity in fashion trends and

design. Only 3% considered themselves to be excellent at technical computer drawing skills. About eighty two percent (81.8%) indicated that their skills had improved very much with subsequent years of practice.

The results revealed a relationship between training background and the use of pattern drafting as a method ($\chi^2 (8, N = 33) = 20.573, p < 0.008$). All pattern makers with degrees and diploma used pattern drafting but none of those with on-job training and grade test certificate used it. They had no training in drafting and were not able to learn it informally. However, this was not the case for the other methods of pattern making. Those with degrees were able to explore in varying percentages all methods of patternmaking. This was in contrast with those with craft certificate and below who tended to specialize in free hand cutting.

There was a relationship between experience and the use of pattern drafting as a method ($\chi^2 (6, N = 33) = 13.265, p = 0.039$). Almost all (90.9%) patternmakers with less than 5years of experience used pattern drafting as a method frequently and this reduced with subsequent years of practice. Free hand cutting was less popular among those of few years of practice. It came out clearly that, most pattern makers always applied the training they had undergone. They reported that although their skills had improved with the training received, experience had contributed more to improving their skills.

6.2 Conclusions

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

- i. Majority of the patternmakers were female. Most of the patternmakers were young adults and had different levels of education from primary to university, with relatively low income.
- ii. All the patternmakers in Nairobi's fashion houses made dresses. The patternmakers also made a variety of other clothes ranging from men's wear, wedding gowns to children's clothes.
- iii. Pattern drafting was the most frequently used method, while free hand cutting was also considerably in use. CADD was the least used method.
- iv. Draping had the longest procedure as it was laborious. It was followed closely by pattern drafting which was time consuming, while free hand cutting had the shortest procedure but it was difficult to make complex original designs with the latter. The major challenge with CADD was lack of skills and of the patternmakers felt that reverse engineering was a tedious process.
- v. Most of the patternmakers had trained in patternmaking at diploma or degree level. Majority of those formally trained had undergone pattern drafting course. Almost all the patternmakers were interested in pursuing other

courses related to pattern making, especially CADD. Most of the patternmakers applied skills gained during training.

- vi. A large number of the patternmakers had less than 10 years of experience in patternmaking. There were very few patternmakers who had several years of working experience and this may be an indication of a shift from the profession, or that the patternmakers have moved on to be business owners. Majority of the patternmakers felt that their skills had improved very much with the subsequent years of practice.
- vii. There was a significant relationship between the patternmakers training background and use of pattern drafting as a method. Those with higher levels of training used the pattern drafting method more. However, free hand cutting was highly in use among those with lower levels of training while CADD was only used by those at degree level of training. Patternmakers at degree level were more versatile in terms of patternmaking practices, and used all the different practices to some extent.
- viii. There was also a significant relationship between patternmaker's years of experience and pattern drafting. Pattern drafting was the preferred method amongst those with fewer years of experience. Patternmakers with more years of working experience were able to utilize several methods of pattern making.

6.3 Recommendations for Policy and Practice

The following recommendations were made for policy and practice from the study findings:

- i. There should be sensitization for more males to take up pattern making jobs. This can be done through career talks in the institutions offering fashion design course and this should involve long serving patternmakers in the industry.
- ii. There is need to sensitize patternmakers through fashion shows and seminars to be versatile enough to make a wide range of clothes. This can cushion them during shaky economic times or as fashion trends change and they will be able to take advantage of opportunities that arise for making different garments and as a result enjoy a wider market share.
- iii. Patternmakers should ensure they are knowledgeable in a wide range of pattern making methods. They should make concerted efforts to acquire skills in technologically advanced methods like CADD which would ensure faster production time and ability to make a variety of designs.
- iv. The Commission of University Education (CUE) and Kenya Institute of Curriculum Development (KICD) should ensure curricula developed for fashion design courses include all of the pattern making methods this would offer the students a variety to choose from.
- v. The learning institutions should diversify the methods of pattern making taught at each level. Apart from pattern drafting that appears to be popular,

emphasis should be equally put other methods such as CADD, draping, freehand in order to ensure graduates acquire skills in all these methods making them ready for the job market.

- vi. Training opportunities should be availed for those already in the job market to ensure they also get a chance develop their skills further. Institutions that offer fashion design can come up with short courses geared towards the job market needs and develop the pattern making skills of those already practicing.
- vii. Institutions offering fashion design as a course in which pattern making is a major component, should take a more practical approach to the course. From the initial stages of the course, tutors should engage students in creating complete garments using the different methods of pattern making. In addition, institutions should avail more practicum opportunities to students with emphasis on the various pattern making methods, as a way of ensuring that the students gain more experience in these skills.

6.4 Recommendations for Further Research.

- i. There is need for a follow up study on patternmakers who have been practicing pattern making for several years in order to gain deeper insight into the pattern making profession.

- ii. Research should be conducted on patternmakers in the garment industry, the Micro and Small enterprises sector to establish their qualification and methods of pattern making used.

- iii. A similar study should be conducted in other towns outside Nairobi to provide better indication of the status of the fashion industry in terms of pattern making across Kenya.

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APPENDICES

APPENDIX A: REQUEST LETTER TO PARTICIPATE IN RESEARCH

Verah Achieng Otieno

Kenyatta University
P. O. Box 43844 Nairobi.
Cell No. 0720231887

Date.....

Dear Sir/Madam,

RE: REQUEST FOR YOUR PARTICIPATION IN RESEARCH

I am a postgraduate student at Kenyatta University pursuing studies for the degree of Master of Science (Fashion Design and Marketing).

As part of the requirements of this degree, I am required to carry out research and present my findings to the school board for approval. My topic is “Patternmakers’ Professional Qualification and Pattern Making Practices”. I would appreciate it if you would complete the questionnaire enclosed. I will collect it upon completion.

Any information given will be treated with confidentiality.

Thank you in advance for your cooperation.

Yours sincerely,

VERAH ACHIENG OTIENO

APPENDIX B: QUESTIONNAIRE FOR PATTERNMAKERS**QUESTIONNAIRE FOR PATTERNMAKERS****QUESTIONNAIRE NO:..... DATE.....****Section 1 – Demographic characteristics (answer by ticking where appropriate)**

1. What is your gender?

- Male
 Female

2. In which of the following age brackets do you fall?

- (18-25)
(26-35)
(36-45)
(Over 45)

3. What is your marital status?

- Single
 Married
 Separated
 Divorced

4. What is your average monthly income from this job?

- Less than Kshs 10,000
 Kshs. 10,000 - Kshs. 19,999
 Kshs.20, 000- Kshs.29, 999
 Kshs 30,000 – 39,999
 Kshs.40, 000 and above

5. (a) Do you have any other source(s) of income?

YES () NO ()

5. (b) if yes, please indicate the type of job and how much you earn?

Job type..... (b) Amount in Kshs.....

6. What is your highest level of education?

- Primary
 Secondary
 Tertiary
 University
 others (specify).....

7. How did your interest in pattern making begin?

- () Family business
 () teacher's influence
 () talent
 () self interest
 () Others (specify).....

8. At what point in life did you start practicing professional pattern making?

9. How long have you been working as a pattern maker?.....years.....months

. Section 2 – Pattern making practice

10. Do you make the following categories of clothing in your fashion house? Tick appropriately.

Clothing categories	YES	NO
Trousers		
Coats and jackets		
Waistcoats		
Shirts and blouses		
Skirts		
Dresses		
Wedding gowns		
Children's wear		
Others (specify).....		

11. For each category of clothing you make, how often do you use the various methods of pattern making listed? On a scale of 1-3. 3. Frequently 2. Rarely and 1. Never.

Practices Clothing categories	Pattern drafting on paper	Free hand cutting on cloth	Draping on body form	Computer Aided Drafting	Patterns from existing garment
Trousers					
Coats and jackets					
Waistcoats					
Shirts and blouses					
Skirts					
Dresses					
Wedding gowns					
Children's wear					
Others specify).....					

12. How knowledgeable are you in each of the following pattern making practices as relates to each category of clothing? On a scale of 1-3. 3. excellent, 2. good, 1. poor

Practices Clothing categories	Pattern drafting on paper	Free hand cutting on cloth	Draping on body form	Computer Aided Drafting	Patterns from existing garment
Trousers					
Coats and jackets					
Waistcoats					
Shirts and blouses					
Skirts					
Dresses					
Wedding gowns					
Children's wear					
Others (specify).....					

13. For each of the following categories of cloths, how long do you take to come up with the final pattern using the pattern making practices familiar to you? Indicate number of hours or minutes.

Practices Clothing categories	Pattern drafting on paper	Free hand cutting on cloth	Draping on body form	Computer Aided Drafting	Patterns from existing garment
Trousers					
Coats and jackets					
Waistcoats					
Shirts and blouses					
Skirts					
Dresses					
Wedding gowns					
Children's wear					
Others (specify).....					

14. For each category of clothing you make, how would you judge your efficiency in relation to the method of pattern making you use? On a scale of, 1-3 i.e. 3. Excellent, 2. Good and 1. Poor.

Practices Clothing categories	Pattern drafting on paper	Free hand cutting on cloth	Draping on body form	Computer Aided Drafting	Patterns from existing garment
Trousers					
Coats and jackets					
Waistcoats					
Shirts and blouses					
Skirts					
Dresses					
Wedding gowns					
Children's wear					
Others (specify).....					

15. Which procedures do you follow to arrive to the final pattern for each of the following method(s) that you use? Tick appropriately or otherwise specify.

a) Pattern drafting

- Sketch – pattern - toile (trial garment) - pattern alteration- sample garment
 () Conceptual idea – pattern – toile – pattern alteration – sample garment
 () Pattern – toile – pattern alteration – sample garment
 () Others (specify).....

b) Free hand cutting

- () Sketch – pattern drawn on fabric – sample garment
 () Others (specify).....

c) Draping

- () Sketch – draping – pattern – toile – pattern alteration – sample garment
 () Draping – pattern – toile – pattern alteration – sample garment
 () Draping – toile – pattern alteration – sample garment
 () textile print on paper – draping paper on body – pattern – toile – pattern alteration – Sample garment
 () others (specify)

d) CADD

- () Sketch by hand – pattern (computer generated) – toile – pattern alteration- sample garment
 () sketch on computer - pattern (computer generated) – toile – pattern alteration- sample garment
 () others (specify).....

e) Patterns from existing garments

- Existing garment- sketch – pattern – toile – pattern alteration – sample garment
 Existing garment – pattern – toile – pattern alteration – sample garment
 Others (specify).....

16. Which of the challenges below do you face in practice of pattern making, or that limit your practice of each of the methods? Tick appropriately or otherwise specify.

a) Pattern drafting

- It is time consuming
 It is expensive
 It is cumbersome (having to use paper patterns)
 Requires a lot of skill
 Others (specify).....

b) Free hand cutting

- A style once cut leaves no record for future reference
 Does not give room for error
 Fabric wastage
 Difficulty in making complicated and original design
 Others (specify).....

c) Draping

- Consumes a lot of fabric
 It is a laborious process
 It is expensive
 limited skills in draping
 Others (specify).....

d) CADD

- Expensive software and hardware
 Limited skills in pattern making using computer.
 limited awareness of packages that are available.
 Lack of skill to use the software
 others (specify).....

e) Patterns from existing garment

- It is a tedious process
 It is wasteful
 It is time consuming
 Others (specify).....

Section 3- Professional Qualifications and Experience

17. What is your highest qualification(s) in fashion design or related courses? Give the title and the institution.

Qualification	Title	College/ Institution
Government Trade test		
Craft certificate		
Diploma		
Degree		
On-the-job training.		
Others (specify).....		

18. Which of the following subjects in pattern making did you cover during your study?

- Pattern making tools and equipments Body measurements
 Pattern drafting Pattern grading
 Pattern alteration Flat pattern design
 Draping Free hand cutting
 Garment fitting Patterns from existing garments
 Computer aided drafting Others (specify).....

19. a) During your years of practice have you done any other courses related to fashion design?

Yes () No ()

19. b) If yes, indicate the title of the course, duration and the institution from which you undertook the study.

Course title	Course duration	Institution

20. Are you interested in pursuing any other courses related to fashion design/ pattern making?

()Yes ()No

Explain your answer above.....

21. How often do you apply the training you have received? Tick appropriately.

- () Always
 () occasionally
 () Never

22. How much have your pattern making skills improved with the courses you have undertaken.

- () Very much
 () improved
 () not improved

23. As a patternmaker, on a scale of 1-3 (3. Excellent, 2. Good, 1. Poor.) which of the following attributes do you possess?

Attributes	Scale
<ul style="list-style-type: none"> • numeracy skills for taking measurements and making calculations 	
<ul style="list-style-type: none"> • creativity in fashion, trends and design 	
<ul style="list-style-type: none"> • communication skills to clearly interpret the wishes of designers 	
<ul style="list-style-type: none"> • technical hand drawing skills 	
<ul style="list-style-type: none"> • technical computer drawing skills 	
<ul style="list-style-type: none"> • An interest in current and future fashion trends. 	

24. Have your pattern making skills improved with the subsequent years of practice?

- () Very much
 () improved
 () not improved

Thank you for taking time to fill in this questionnaire.

APPENDIX C: RESEARCH AUTHORIZATION FROM NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

REPUBLIC OF KENYA



NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telegrams: "SCIENCETECH", Nairobi
Telephone: 254-020-241349, 2213102
254-020-310571, 2213123.
Fax: 254-020-2213215, 318245, 318249
When replying please quote

P.O. Box 30623-00100
NAIROBI-KENYA
Website: www.ncst.go.ke

Date: **1st March 2011**

Our Ref: **NCST/RR1/12/1/SS-011/176/4**

Verah Achieng Otieno
Kenyatta University
P. O. Box 43844
NAIROBI

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Effects of patternmakers' professional qualification on pattern making practices: A case of fashion houses in Nairobi, Kenya*" I am pleased to inform you that you have been authorized to undertake research in **Nairobi Province** for a period ending **30th June 2011**.

You are advised to report to **The Registrar of Companies, Nairobi and the Chief Executive Officers in the selected Patternmakers' Fashion houses in Nairobi** before embarking on the research project.

On completion of the research, you are expected to submit **one hard copy and one soft copy** of the research report/thesis to our office.


P. N. NYAKUNDI
FOR: SECRETARY/CEO

Copy to:

The Registrar of Companies
NAIROBI

The Chief Executive Officers
Selected Patternmakers' Fashion Houses in Nairobi

APPENDIX D: STUDY LOCATION MAP

