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Pattern Making Skills Training and Technical Universities Graduates' Performance in Freehand Cutting in the Indigenous Ghanaian Fashion Industry

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Abstract

Purpose: The purpose of this study was to establish pattern making skills training and technical university graduates' performance in freehand cutting in the indigenous Ghanaian fashion industry.

Methodology: A cross-sectional survey design was employed to carry out this study. The target population for this study was lecturers teaching pattern making and garment technology in technical universities in Ghana and B-Tech and HND self-employed graduates of the fashion design programme respectively. Purposive sampling and snowball sampling techniques were used to select the study participants. The sample size for the study was 228 (fashion graduates 200 & 28 lecturers). A questionnaire, interview guide and non-participant observation were the research instruments used for data collection. The data collected was analysed quantitatively and qualitatively to address the objectives. Statistical Package for Social Sciences (SPSS) version 21 was used to analyse the quantitative data obtained from a close-ended questionnaire. The qualitative data obtained through interviews and non-participant observation were analysed manually under various themes.

Findings: The results of the study indicated that flat pattern drafting and draping were the drafting skills always used by lecturers of technical universities in training their students while the reverse engineering technique was rarely used in technical universities. The study also established that the majority of self-employed fashion graduates were unable to perform freehand cutting since there were not exposed to the freehand cutting technique when they were in technical universities.

Unique contribution to theory, practice and policy: The study recommended that freehand cutting should be introduced into the curriculum of technical universities which did not have it in their curriculum. The study also recommended that technical universities should organize workshops for their self-employed graduates who do not have freehand pattern making skills.

Keywords: *Pattern, Pattern Making, Freehand Cutting, Indigenous Fashion Industry.*

1. **Introduction**

One of the aims of the fashion design and textile programme in technical universities in Ghana is to produce highly-skilled fashion experts, who are adequately equipped to take on a diversity of roles in the fashion industry in Ghana and beyond. Pattern making is one of the major roles graduates from technical universities are expected to perform effectively in the fashion industry after training. It is imperative for learners in technical universities in Ghana to study the universal techniques of pattern making done in the large-scale fashion industry but they must also gain freehand cutting pattern making skills that can enable them to perform well in the indigenous fashion industry in Ghana. A pattern in fashion design is made of paper, fabric and other material that is used as the vital instruction guide for cutting the components of a garment. A pattern normally contains information such as size, seam allowance and fit. According to Hofenbitzer (2021), a pattern is a design made of paper or cardboard - also in digital form for automatic cutting. A pattern is the actual copy of different parts of a garment that is made by cutting board or hard paper by using measurements which have taken from models or dress forms after sketching on it (Naznin et al., 2017).

Pattern making involves drafting paper patterns to create well-fitted garments. It's like creating the blueprint of style on paper before making the actual garment. It involves calculations over the body measurement and drafting the patterns (Karra, 2020). Pattern making is mostly the art of designing and coming out with an outline plan or arrangement for making apparel (Aldrich, 2014). According to Afroza (2021), pattern making is a skill that is the art of manipulating and shaping a flat piece of fabric to conform to one or more curves of the human figure. Pattern making is an individual art, where manipulating and shaping a flat piece of fabric to conform to one or more curves of the human figure (Naznin et al., 2017). There are various techniques of pattern making. These include flat pattern making, draping, reverse engineering pattern making, direct/freehand pattern making and digital pattern making.

The flat pattern making is plotting body measurements on flat supports such as paper or cloths which are not fashion fabrics. According to the Central Board of Secondary Education (2014), flat pattern making is a method where accurate measurements are taken in body or dress form to complete the paper component of the garment. Anikweze (2013) states that flat pattern drafting involves using a sheet of paper, a pencil and all the pattern drafting tools and coming out with a pattern based on a set of body measurements.

Flat pattern making is a two-dimensional technique of pattern making which is done by using body measurements or by using a standard template referred to as a block or base pattern (Pritchard, 2013). The block is a basic shape with no seams added that fits a standard sample size. When there are no seams on a pattern piece it is called a net pattern (Pritchard, 2013). A set of flat patterns includes the sleeve block. Figure 1 displays the flat patterns.

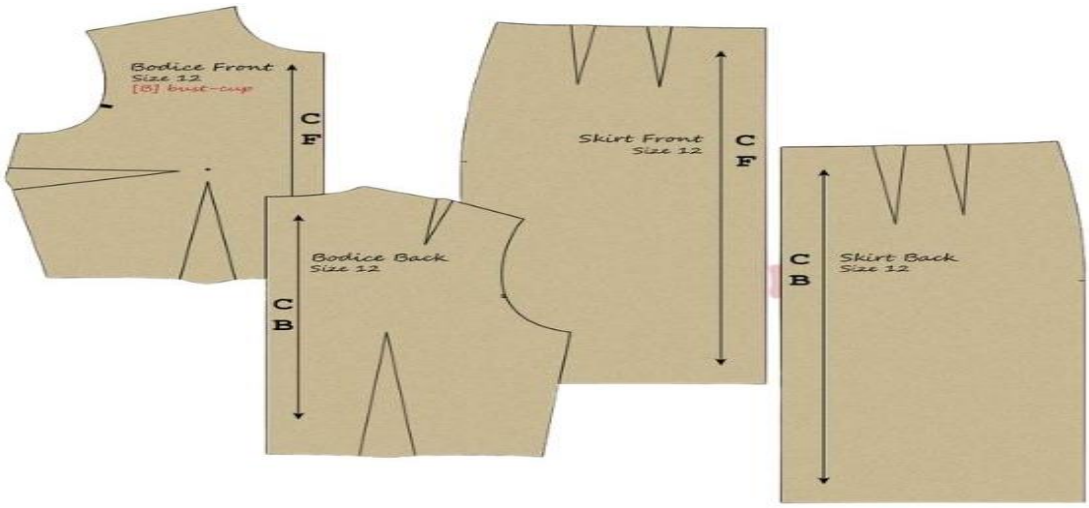

Figure 1: Flat patterns

Source: Sew n sew sewing school

Draping also known as modeling is the technique of pattern making that involves manipulating, sharping, pining and cutting muslin or other fabrics over a dress form to create a pattern from which a garment can be made (Sterlacci, 2019). Draping involves wrapping a two-dimensional fabric around a dummy or dress form making it take the form of the dummy to produce a three-dimensional design. In draping, a block fitted with the standard body of a model is made, which is called the toile. This toile is used in the body of the model and it is made maintaining adjustment and balance with the body of the model. Then the toile is removed from the body of the model and each of the parts of the toile is drawn separately on a piece of paper. Patterns made in this system become very accurate but it takes much time (Textilesblog, 2020).

Draping is a pattern making process that allows designers to work with the actual materials on the 3D form while creating their designs (Maqsood et al., 2019). By using a combination of manipulations such as cuts, twists, folds, and tucks, a designer can skillfully transform a piece of fabric into a garment. Seeing the development of a 2D sketch into a 3D form during the draping process can eliminate some of the guessing that would be involved if the designers are using flat patterns. According to Armstrong (2008), draping not only gives the designers the freedom to be more creative but also allows the designers to evaluate the design at each step of the process.

In addition, using flat patterns to create complicated designs could be challenging but draping would make this possible since it enables the designers to work directly on the dress form or human body (Kiisel, 2013). Draping as a technique is accomplished by pinning the fabric onto the mannequin as perceived through a specific design. The pinning process requires the draper to follow the measurements according to the style of the design and to achieve the silhouette or the outline that will result in the perfect pattern. The desired draped silhouette is either traced onto a

sheet of paper or onto the fabric itself for final pattern making (Qazi, et al., 2018). In draping, either muslin or fashion fabric can be used. Figure 2 indicates draped patterns.

Figure 2: Draped patterns

Source: Textiles learner

Reverse engineering pattern making is a method in which patterns are made from existing garments. There are two types of reverse engineering pattern making. These are knock-off and copying. Knock-off involves unstitching or unpicking existing garments and tracing the components onto paper with the help of a pencil, pen or tracing wheel. The copying reverse engineering is tracing components parts of a garment onto a support to make patterns. In reverse engineering, the patterns taken from existing garments can be used in the size fits or graded up or graded down to achieve the suitable measurement. Figure 3 shows the two types of reverse engineering.

Figure 3: Reverse engineering pattern making

Source: www.ButtonandSnap.com https://www.thecreativecurator.com/make-sewing-pattern-woven/

Direct method/freehand pattern making is a system of pattern cutting that uses a combination of ease and seam allowance and body measurements taken from the body of a customer or a dress form measurement to create patterns for the chosen design. It is a method of pattern construction based on systematic measurements taken directly from the human form (Central Board of Secondary Education, 2014). Freehand cutting is a method of cutting a style of apparel directly on the fabric without the use of a pattern (Efajemue & Lily, 2011). Many types of apparel worn these days apart from ready-to-wear apparel are usually made from free-hand cutting. This is because the majority of Ghanaian dressmakers are used to this technique in contrast to pattern drafting which is more costly and time consuming. Foster and Ampong (2012) noted that little has been done on documentation on free-hand cutting. Figure 4 displays the direct/freehand pattern making.

Figure 4: Direct/freehand cutting

Source: https://www.waynearthurgallery.com/what-is-freehand-cutting-in-sewing/

Digital pattern-making involves using computer software to develop the basic component of the garments. There are two ways of digital pattern drafting. These are the *first pattern and digitalisation*. The first pattern-making involves developing the basic component of the garment using computer software. Digitalisation is the process of scanning and feeding manually drafted patterns or patterns which are on paper into the memory of the computer using digitising boards, digs pens or dig mouse. These digitised patterns are then made available for modifications. Digitalisation pattern making is normally adopted whenever the clients come up with their own patterns to be used to manufacture a garment for them (Kassah et al., 2022). Computer systems can be used to proportionately decrease or increase the size of a pattern, whilst maintaining the shape, fit, balance, and scale of the garment. It can also be used to make markers and cut patterns. A digital pattern making system essentially consists of a computer, CAD software, digitising tablet and a plotter (Hofenbitzer,2021). Figure 5 displays the digital pattern making.

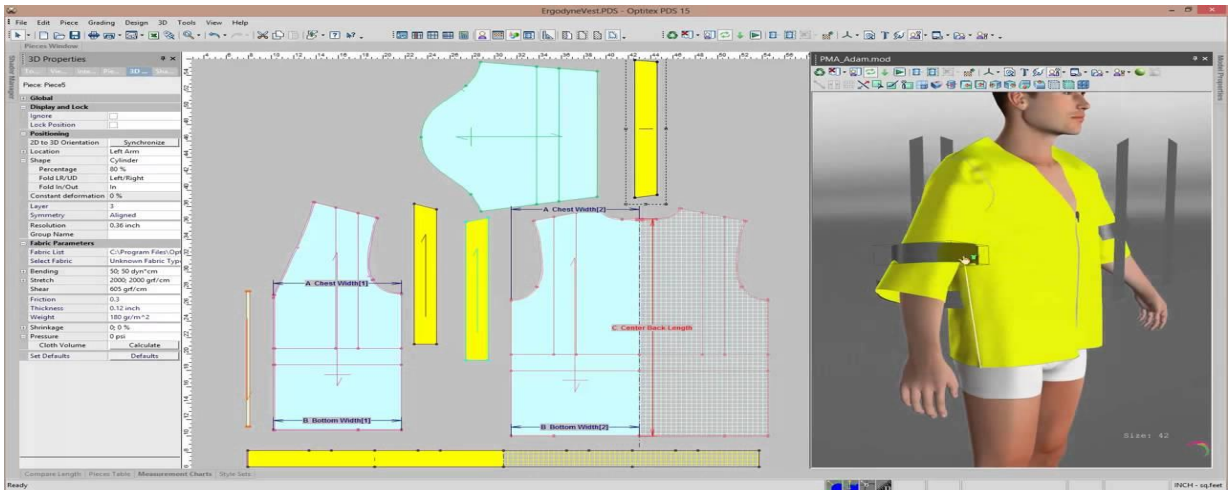

Figure 5: Digital pattern making

Source: Assyst Bullmer Limited

1.1 Statement of the Problem

The study of fashion design in Ghana technical universities is designed to give holistic training to learners in pattern making and other garment production activities to enable them function well in the large-scale and indigenous fashion industry. Graduates are expected to produce indigenous Ghanaian garments and textile products with international appeal. The programme also aimed at equipping learners with entrepreneurial and managerial skills for self-employment in the fashion industry. There have been speculations that though fashion design training in technical universities in Ghana is designed to be holistic, graduates lack skills in freehand cutting which is mostly practiced in indigenous fashion industry where most of them find themselves self-employed. However, over the years, much studies have not been done in support of these conjectures. The study done on freehand cutting in Ghana focused on teaching and learning of freehand cutting in senior high schools in Ghana (Gavor & Danquah, 2018). This study was to investigate the pattern making training received in the technical universities in Ghana and graduates' performance in freehand cutting in the indigenous fashion industry.

1.2 Objectives of the Study

i. To establish the nature of pattern making skills fashion design graduates received from technical universities.
ii. To determine the pattern making techniques mostly performed in the indigenous fashion industry in Ghana.
iii. To discuss graduates' performance in freehand cutting in the indigenous fashion industry in Ghana.

1.3 Research Questions of the Study

i. What is the nature of pattern making skills fashion design graduates received from technical universities?

ii. What is the pattern making technique mostly performed in the indigenous fashion industry?
iii. To what extent is the performance of self-employed fashion graduates in freehand cutting in the indigenous fashion industry in Ghana?

2. **Research Design**

This study employed a cross-sectional descriptive survey to amass data. The cross-sectional descriptive survey was considered because it has the advantage of soliciting respondents' views on the nature of the situation as it existed at the time of the study (Bakker-Edoh et al., 2021). A cross-sectional survey was used because it permitted the collection of both quantitative and qualitative data from the target population under study at the lowest cost (Freytag & Young, 2018). The target population for this study was lecturers teaching pattern drafting in technical universities, B-Tech and HND self-employed graduates of the fashion design programme respectively. The lecturers were involved in the study because they taught fashion graduates when they were in school. The self-employed fashion graduates were selected because they know much about the topic under study.

Purposive sampling and snowball sampling techniques were used to select the study participants. There were many lecturers teaching the various courses of the fashion design programme in the technical universities. The purposive sampling technique was used to select only the pattern drafting lecturers. The snowball sampling was used to trace the fashion design graduates since there were no data on the location of the graduates. The sample size for the study was 228 (fashion graduates 200 & 28 lecturers).

A questionnaire, interview guide and non-participant observation were the research instruments used for data collection. A closed-ended questionnaire was used to collect data from pattern making and garment technology lecturers and graduates who were self-employed in the indigenous fashion industry. An interview guide was used to collect data from some of the pattern making and garment technology lecturers and graduates. The non-participant observation was used to observe the pattern making activities in the pattern making laboratories in the technical universities.

The data collected was analysed quantitatively and qualitatively to address the objectives. Statistical Package for Social Sciences (SPSS) version 21 was used to analyse the quantitative data obtained from a close-ended questionnaire. The qualitative data obtained through interviews and non-participant observation were analysed manually under various themes.

3. **Findings and discussion**

3.1 Findings

Objective one: To establish the nature of pattern making skills fashion design graduates received from technical universities.

Pattern making and garment technology lecturers were asked to rate how regularly they use various pattern making techniques to train their students. The scores of the lecturers were analysed to obtain percentages. The results are displayed in Table 1.

Table 1: Results from pattern making and garment technology lecturers

S/N	Pattern making Techniques	Never	Rarely	Often	Always
1.	Flat pattern drafting	0 (0.00%)	0 (0.00%)	0 (0.00%)	28 (100 %)
2.	Draping	0 (0.00%)	0 (0.00%)	0 (0.00%)	28 (100 %)
3.	Freehand cutting	24 (85.7%)	4 (14.3%)	0 (0.00%)	0 (0.00%)
4.	Reverse engineering	19 (67.9%)	9(32.1%)	0 (0.00%)	0 (0.00%)
5.	Digital pattern making	25 (89.3%)	3 (10.7%)	0 (0.0%)	0 (0.0%)

Results in Table 1 indicate that the majority of the technical university pattern making and garment technology lecturers 28 (100%) used flat pattern making and draping techniques always in training their students. The results in Table 1 also show that a higher number of lecturers 27 (96.4%) never used the freehand cutting technique of pattern making whilst 1(3.6%) rarely used the method. It was also revealed in Table 1 that 19(67.9%) technical university pattern making and garment technology lecturers never used the reverse engineering pattern making method whilst 9 (32.1%) rarely used the reverse engineering pattern when equipping the learners with skills of pattern making.

It is indicated in Table 1 that 25 (89.3%) pattern making and garment technology lecturers never used digital pattern making techniques in training learners while 3(10.7) rarely used the method. The findings showed that though freehand pattern making was largely used in the indigenous fashion industry in Ghana fashion graduates from the technical university were not equipped with freehand pattern making skills. In order to validate the data obtained from lecturers, self-employed fashion graduates were also asked to fill out the questionnaire by indicating the pattern making techniques they received in the technical universities during their training. The scores of the technical university fashion graduates were analysed to obtain percentages. The results are displayed in Table 2.

Table 2: Results from self-employed fashion graduates

S/N	Pattern Making Techniques Received from Technical Universities	Yes	No

1.	Flat pattern making	200 (100%)	0 (0.00%)
2.	Draping	200(100%)	0 (0.00%)
3.	Freehand cutting	21 (10.5%)	179 (89.5%)
4.	Reverse engineering	42 (21.0%)	158(79.0%)
5.	Digital pattern making	200 (100%)	0 (0.00%)

The findings in Table 2 show that all 200 (100%) of the technical university fashion graduates received practical training in flat pattern making, draping and digital pattern making. However, 179 (89.5%) said they were not trained in freehand cutting while 21(10.5%) said they received freehand cutting from the technical universities. The findings in Table 2 also indicate that the majority 158 (79.0%) of the fashion graduates did not receive training in reverse engineering pattern making while 42(21.0%) received training in this method. The current findings showed that some technical universities were giving holistic pattern making training whiles others were selective in their training.

Objective two: To determine the pattern making techniques mostly performed in the indigenous fashion industry in Ghana.

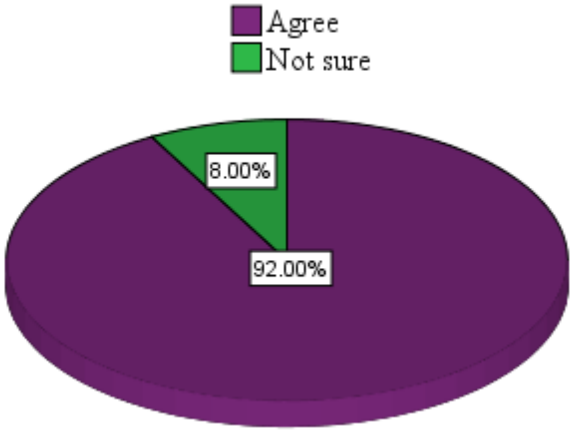

Figure 1: Pattern making technique mostly used in the indigenous fashion industry

In Figure 1, the majority of the self-employed fashion graduates 184 (92%) indicated that freehand cutting is mostly used than any other pattern making technique whilst 16 (8%) said they were not sure. This implies that due to the type of orders fashion designers in the indigenous fashion industry obtain freehand cutting is the most appropriate technique to be employed and must be learned in the technical universities in Ghana.

Objective three: To discuss graduates' performance in Freehand Cutting in the Indigenous Fashion Industry in Ghana

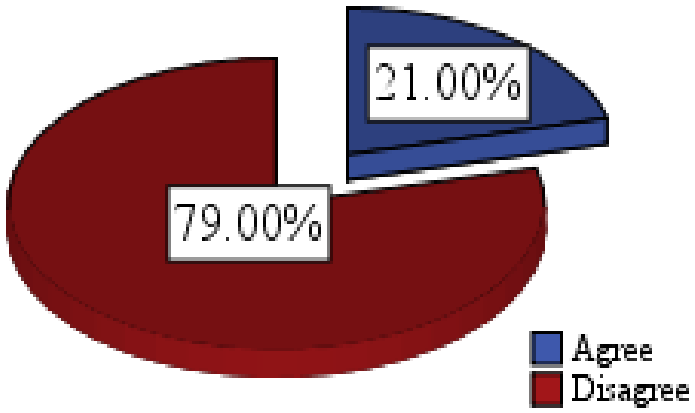

Figure 2: Graduates' performance in freehand cutting in the indigenous fashion industry

In Figure 2, the higher of the self-employed fashion graduates 158 (79%) disagreed that they can perform freehand cutting effectively while 42 agreed that they can make patterns using the freehand technique. The findings simply mean most of the technical university graduates did not have skills in freehand pattern making because they were not taught during their training in technical universities.

3.2 Discussion of the Findings

Objective one: To establish the nature of pattern making skills fashion design graduates received from technical universities.

The results of the study indicated that flat pattern making and draping were the drafting skills always used by lecturers of technical universities in training their students while the reverse engineering technique was rarely used in technical universities. The study also indicated that though students were supposed to receive holistic pattern making skills in technical universities, the majority of the fashion graduates were not exposed to freehand cutting. The majority of pattern making and garment technology lecturers indicated through the interview that they were not exposing their learners to direct or freehand cutting because it was not in the technical university curriculum they were running.

Objective two: To determine the pattern making techniques mostly performed in the indigenous fashion industry in Ghana.

The study found that the direct method or freehand cutting was the pattern making technique mostly used in the indigenous fashion industry in Ghana. It was explained through the interview the study conducted that apart from ready-to-wear apparel such as uniforms which were produced in bulk most of the apparel produced in the indigenous fashion industry was custom made hence

most of the fashion designers preferred using the freehand cutting method of pattern making because they were of the view that other pattern making methods were more costly and time-consuming when used for custom made apparels. The findings of our study agreed with the findings of Forster and Ampong (2012) who were of the view that though it is imperative for learners to acquire the universal techniques of cutting patterns for garments, they must also gain skills that can enable them to work within their immediate environment. The study also supports the findings of Gavor and Danquah (2018) who stated that in Ghana, using flat pattern work is expensive and reserved for selected customers and apparel where appropriate monies can be charged. It is, therefore, not to the advantage of the university fashion learners to be provided enough skills in other pattern making skills than freehand cutting.

Objective three: To discuss graduates' performance in Freehand Cutting in the Indigenous Fashion Industry in Ghana

The study established that most graduates from technical universities in Ghana were unable to perform freehand cutting since there were not taught during their training. The study further indicated that the self-employed fashion graduates who were using freehand cutting for their garment production went through apprenticeship training after the technical university to learn freehand cutting. Some also said they learned freehand cutting from their relatives before they enrolled in technical universities.

Others also indicated that they learned freehand cutting during their industrial attachment at the indigenous fashion industry. Those who were not able to learn freehand cutting before completing their programme at the technical universities and were unwilling to learn through apprenticeship had no option but to always use flat patterns and other pattern making methods whenever they get orders which demand freehand pattern making. This situation made most of the self-employed fashion graduates lose customers since they were not able to meet deadlines due to their inability to use freehand cutting to speed up the production process of their garments.

The findings of this study confirmed the findings of Gavor and Danquah (2018) who stated that numerous fashion design and textiles learners in Universities in Ghana went into part-time apprenticeship training from Small Scale Garment producers while still in school or after graduation, to acquire skills in freehand cutting before they could be able to engage in clothing construction using the freehand pattern making method. The findings of this study also accented to the findings of Forster and Ampong (2012) who opined that the skills tertiary fashion design and textiles graduates learned in school were not relevant to what was required in the small-scale garment industry in Ghana.

4. Conclusions and Recommendations

4.1. Conclusions

The purpose of this study was to establish pattern making skills training and technical university graduates' performance in freehand cutting in the indigenous Ghanaian fashion industry. Based on

the findings of the study, it was concluded that flat pattern, draping and digital pattern making which are largely performed in the large-scale fashion industry were the pattern making skills taught in technical universities in Ghana. The study also concluded that freehand cutting which is largely practiced in the indigenous fashion industry was not taught in most technical universities in Ghana.

4.2. Recommendations

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

i. The study recommended that freehand cutting should be introduced in the curriculum of technical universities which did not have it in their curriculum.
ii. The study also recommended that technical universities should organise workshops for their self-employed graduates who do not have a direct method or freehand pattern making skills.

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