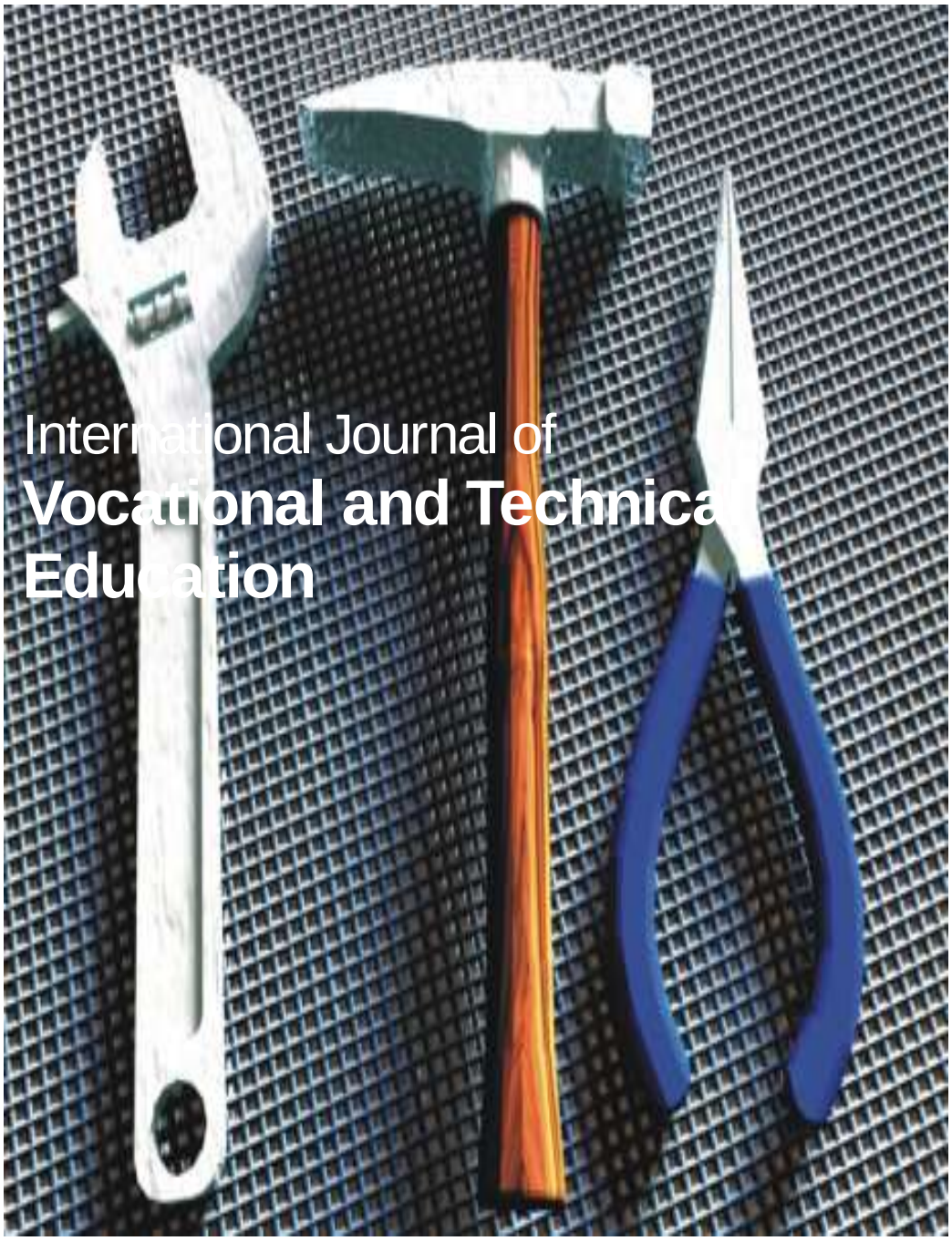
OPEN ACCESS



International Journal of Vocational and Technical Education

October 2018
DOI: 10.5897/IJVTE
www.academicjournals.org

ACADEMIC JOURNALS
expand your knowledge

ABOUT IJVTES

The International Journal of Vocational and Technical Education is published monthly (one volume per year) by Academic Journals.

The International Journal of Vocational and Technical Education (**IJVTE**) Provides rapid Publication (monthly) of articles in all areas of the subject such as apprenticeship systems, Procedural knowledge, industrial training, entrepreneurship education, Memory vocabulary Learning strategies etc.

The Journal welcomes the submission of manuscripts that meet the general criteria of significance and scientific excellence. Papers will be published shortly after acceptance. All articles published in IJVTE are peer-reviewed.

Contact Us

Editorial Office: ijvte@academicjournals.org

Help Desk: helpdesk@academicjournals.org

Website: http://www.academicjournals.org/journal/IJVTE

Submit manuscript online http://ms.academicjournals.me/.

Editorial Board

International Journal of Vocational and Technical Education

Table of Contents: Volume 10 Number 6 October 2018

ARTICLE

Vol. 10(6), pp. 46-53, October 2018
DOI: 10.5897/IJVTE2018.0260
Article Number: 08A092958949

http://www.academicjournals.org/IJVTE

ACADEMIC JOURNALS
expand your knowledge

International Journal of Vocational and Technical Education

Full Length Research Paper

Knowledge of formally and informally trained dressmakers on the application of dart principles in garment designing

Deborah Amoako Asare*, Patience Danquah Monnie and Modesta Efua Gavor

Department of Vocational and Technical Education, University of Cape Coast, Cape Coast, Ghana.

Received 11 August, 2018; Accepted 27 September, 2018

This study assessed and compared formally and informally trained dressmakers with regard to their use of dart principles in pattern making and garment designing. The descriptive research design was used for the study with a sample size of 50 dressmakers selected from three districts in the central region of Ghana. The instruments used for data collection were a semi-structured interview guide and an observation check list. The data collected were analysed with the help of descriptive and inferential statistics using the Predictive Analytical Software for windows version 22. The results of the study revealed significant differences between formally and informally trained dressmakers with regard to the application of dart principles manipulation and contouring, but not added fullness. Generally, the formally trained dressmakers performed better than the informally trained ones with the application of the three dart principles assessed in this study. It was therefore recommended that the dressmakers and tailors association incorporate a little theory on the preliminary stages involved in garment designing such as dart use into the framework they use in training apprentices. This will enable apprentices who will establish their own apparel production industry in the future treat preliminary stages with much importance.

Key words: Dressmakers, training, dart principles, pattern making, garment designing.

INTRODUCTION

In garments designing, a garment producer can use paper patterns obtained through a manual or electronic means or direct plotting on fabric (freehand cutting). The kind of method a dressmaker chooses to work with is informed by the level of knowledge, skills, and competence he or she has from dressmaking training (Forster and Ampong, 2012). In Ghana, the main method used for cutting out garment by dressmakers is the freehand method; however, some dressmakers in the industry resort to the use of patterns in cutting out garments for their customers (Forster, 2009). Forster (2009) defined freehand cutting method as using an individual's body measurements to cut garments directly from a fabric, and dressmakers who employ this method use different methods to cut the same design. Thus, every dressmaker generates a method which is convenient for him or her to cut out a style. This also implies that, there are no laid down rules that govern the

*Corresponding author. E-mail: Kwesiappiah24@yahoo.com. Tel: 0509368413.

use of this method. The use of patterns requires dressmakers to first of all build the desired style and fit of the garment onto a piece of paper before the actual cutting out is done on the fabric using the pattern as a guide. According to Forster (2009), the use of paper patterns allows the dressmaker to identify and correct any form of problem before the actual cutting out is done. Irrespective of the method of garment making used by a dressmaker, Keiser and Garner (2003) stated that, garment makers need to produce garments that fit well and as well have a professional finished look. It was further noted that dressmakers can only achieve good fit and professional looking garments by being knowledgeable about elements that influence shape, silhouette, and style of a garment.

According to Brown and Rice (2001), shape, silhouette, and style capture the essence of apparel design and decisions about these three terms guide the design development process. In order to achieve shape, style and proper fit in garments, dressmakers resort to the use of darts, dart equivalents or dart substitutes. According to Baker (2007), darts are used to shape fabric to fit the body curves by controlling fullness or excess fabric. The wide base of a dart takes in fabric fullness so that a garment fits the narrower part of the body. Darts that may be featured in a garment includes waist darts, bust darts and elbow darts. The overall shape of a garment is the first thing an individual sees before any other details are conveyed (Fischer, 2009). This shows that dart, which is a feature in garment that helps to create shape, cannot be overlooked. Other functions of darts are that they can be used decoratively for varying effects. For dressmakers to produce garments that fit well with the application of dart, they have to be knowledgeable about the principles that govern dart use. Hollen and Kundel (1992) noted that anybody who is into the production of garments should have a thorough understanding of the functions of darts and how darts are used to create designs. Designing with darts in garment designing are founded on three basic principles namely; Dart manipulation, Added fullness and Contouring. In this research, these principles are referred to as dart principles. The principles can be used independently or combined to give varying effects. In applying these dart principles in garment designing, a dressmaker can decide to apply the principles manually or employ the use of computer aided design (CAD) software depending on the form of training received by a dressmaker which could be formal or informal means (apprenticeship training).

With respect to manual application of the dart principles, the dressmaker develops a basic block with a set of measurement; this basic block serves as a working pattern from which other designs are derived through the application of the dart principles. With the Computer Aided Design (CAD), it is software in the apparel industry mainly used in various processes such as garment design, pattern preparation, pattern grading and marker making. In using the CAD software, the main size patterns are prepared manually and then digitised by following a set of procedures. The pattern principles are then applied electronically for varying effects.

Irrespective of the mode of application a dressmaker decides on, Fischer (2009) asserted that applications of the dart principles are the most creative and flexible part of pattern making. The possibilities of creating designs with these principles are endless and the designer's imagination is the only limitation. In applying these principles, darts can be relocated, turned into pleats, gathers or stylelines. Fischer (2009) indicated that these techniques do not only create fit, shape and volume; they also change the style and design of the garment. In-depth knowledge on the appropriate application of dart principles can therefore help dressmakers keep up with fashion and produce garments that appeal to their customers' fashion sense and as well provide good fit. However, an individual can only apply what he or she has learnt or been taught.

This research was therefore carried out to determine if knowledge in the use of dart principles in garment design and construction would differ depending on the kind of training the garment maker had received. The outcome of this study was anticipated to help the national board for small-scale industries, in making decisions pertaining to garment designing when it comes to upgrading the skills of members in the apparel industry. The results of this study would also indicate if there is the need for a change or improvement in the curriculum content of the teaching of garment making in any of the learning settings (formal and informal).

Hypotheses

To achieve the aim of the study, the following hypotheses were tested.

$H0_1$: There is no significant difference between formally trained dressmakers and informally trained dressmakers with the creation of designs with dart manipulation.
$H0_2$: There is no significant difference between formally trained dressmakers and informally trained dressmakers with the creation of designs with added fullness.
$H0_3$: There is no significant difference between formally trained dressmakers and informally trained dressmakers with the creation of designs with contouring.

METHODOLOGY

The design used for the study was the descriptive research and the data were collected at a single point in time. Descriptive research design is categorized into observation studies, correlational research, developmental designs and survey research (Leedy and Ormrod, 2010). For the purpose of this research, two of the descriptive designs were combined which were survey and observation studies.

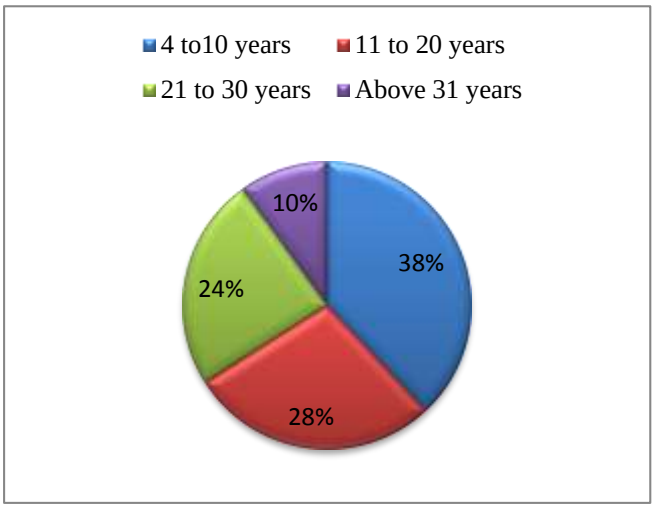


Figure 1. Respondents number of years of working.

Population

The participants used for the study were tailors and dressmakers in the central region of Ghana.

Sample and Sampling procedure

Fifty dressmakers were randomly selected through the multistage version of cluster sampling design. Three stages of cluster sampling were used before final participants were selected. First, using the districts as clusters, 3 clusters were randomly selected through the lottery method from a compilation of the entire district in the Central region. The three districts selected were Agona West Municipal District, Komenda Edina Eguafo Municipal and Cape Coast Metropolitan District. In each cluster (district), the association is divided into zones. Systematically 7 zones were selected from the three clusters. The zones chosen were Swedru, Nyakorom, Elmina, Komenda, Kawoano-Pado, Abura and kakumdo. Finally, a sampling frame was constructed for each zone after which the lottery method was employed to select the 50 participants.

Instrument

Semi-structured interview guide and observation checklist were the instruments used for collecting data. The semi-structured interview guide contained items related to participants' form of training, knowledge base on darts and how they applied the dart principles in garment designing. The observation checklist used had items related to tools and materials for measuring, how dressmakers take measurements, location of dart points, curves, lines and notches and manipulation and treatment of darts by dressmakers.

Data collection procedure

The dressmakers were contacted to seek their consent to participate, fix dates for personal meeting and data collection. Each dressmaker had to select a female client as his or her model for test designs provided. Brown papers and fabrics were provided for dressmakers to demonstrate how they would apply the dart principles to make test designs for 1) A-shape princess dress depicting dart principle manipulation, 2) gathered yoke skirt showing dart principle added fullness and 3) a strapless bodice indicating dart principle contouring. The measuring procedure used for each test design, plotting of design with measurement, cutting process and sewing were observed by the researchers and recorded.

Data analysis

The data collected were analysed with the use of descriptive and inferential statistics in the Predictive Analytical Software (SPSS) for windows version 22. The hypotheses were tested with the use of the independent samples t- test. This statistical tool helped to determine if there was a statistically significant difference between dressmakers with different form of education in terms of their application of the dart principles.

RESULTS AND DISCUSSION

Background information of respondents

The sample was made up of established dressmakers who had received either formal or informal training in dressmaking. The study excluded apprentices due to the fact that they were being trained under the tutelage of these established dressmakers (madam or master). Thus, the knowledge base of the madam or master is what is transferred to the apprentice. The participants of this study comprise 39 women and 11 men and were between the ages of 25 and 60 with varying years of work. The least number of years of work as established dressmakers among the participants was 4 years (Figure 1). The participants were therefore considered as competent and experienced dressmakers. The participants had different educational backgrounds. Nine representing 18% had not received any formal education but the remaining 41 (82%), had received formal

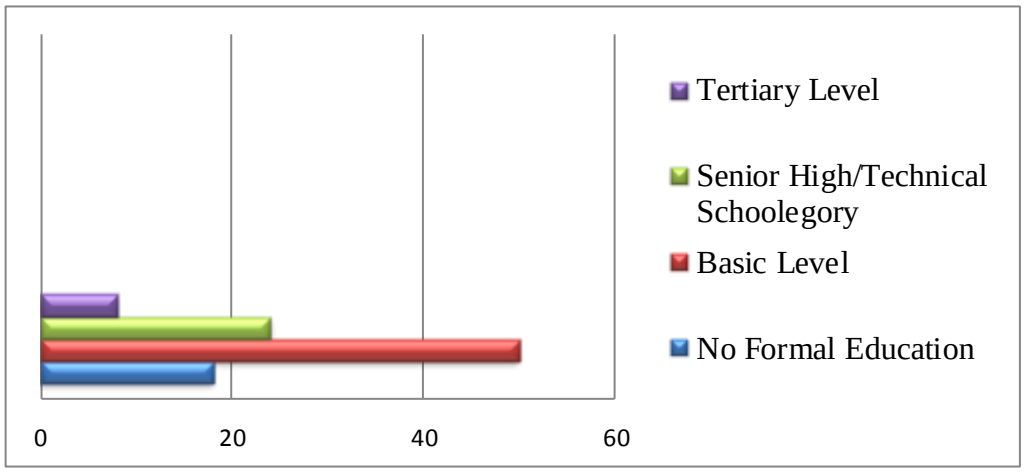


Figure 2. Level of education of respondents.

education at different levels (Figure 2).

According to Bortei-Doku et al. (2011), different systems of Technical Vocational Education and Training (TVET) have evolved in Ghana and individuals who want to pursue this form of training can opt for any depending on their goals, aspirations, expenses involved, among many other factors. The form of education received for dressmaking by sampled dressmakers constituted 20 (40%) formally trained and 30 (60%) informally trained dressmakers (Table 1). Table 1 shows the origin of skill acquisition for dressmaking. As indicated in Table 1, the composition of formally trained dressmakers were 7 (14%) NVTI graduates, 3 (6%) Senior Technical graduates, 2 (4%) Polytechnic graduates, 7(14%) Fashion school graduates and only one (2%) University graduate. Those who had been trained informally constituted 30 (60%) dressmakers who acquired the skills through solely apprenticeship training.

Differences between formally and informally trained dressmakers with the application of the three dart principles in garment designing

To establish whether differences existed between formally and informally trained dressmakers with regard to dart use, the respondents were first of all assessed on all the elements that come to play with the application of the dart principles thus; Design Analysis (D. A), Dart Treatment (D.T), Cutting Out (C.O), Sewing of Test Design (S.T.D), Achieving a Replica of Test Design (A.R.T.D) and Fit of Test Design (F.T.D). Raw scores were determined by allocating 5 points to each element based on procedures and associated basic rules that govern the execution of each element. The number of procedures and associated basic rules that were observed in each element constituted the raw scores for each dressmaker.

Results for the comparison of formally and informally trained dressmakers with the application of dart manipulation principle (Design 1) in garment designing

Table 2 presents the descriptive statistics results on the comparison made of formally and informally trained dressmakers with the application of dart manipulation principle (Design 1) in garment designing. With respect to the application of dart manipulation (Design 1) in garment designing, frequencies of scores and corresponding mean scores from Table 2 indicate that, the general performance of formally trained dressmakers in the design analysis (M=3.00), dart treatment (M=4.33), cutting out (M=5.00), sewing (M=5.00), achieving a replica (M=4.66) and fit of test design (M=4.00) were better than that of informally trained dressmakers as lesser mean score for design analysis (M=1.75), dart treatment (M=3.25), cutting out (M=3.25), sewing (M=3.25), achieving a replica (M=3.75), and fit of test design (M=3.00) were recorded. These differences in scores could be attributed to formally trained dressmakers ability to indicate basic darts involved in the creation of Design 1. According to Fischer (2009), identification of darts involved in the creation of a design gives the garment producer an idea as to how to treat or manipulate the dart to achieve a replica of the design. Observation of formally trained dressmakers with the application of dart manipulation principle showed that, the assertion made by Fischer (2009) was true as their ability to analyse test Design 1 greatly influenced the end product. It was also observed that Design 1 garment fitted well on formally trained dressmakers' models than that of informally trained dressmakers' models. This can also be attributed to the fact that formally trained dressmakers had knowledge about how the basic darts involved should be treated to achieve the desired effect. However, the statistical outcome that determined whether

Table 1. Origin of skill acquisition of respondents.

Origin of skill acquisition	No.	%
Formal		
Senior High/Technical School	03	06
NVTI	07	14
Fashion School	07	14
Polytechnic	02	04
University	01	02
Informal		
Apprenticeship	30	60
Total	**50**	**100**

Table 2. Mean values of the comparison of formally and informally trained dressmakers with the application of dart manipulation principle (Design 1).

Total	1	2	3	4	5	Total	Mean
Assessment of test Design 1	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**score**
Formally trained							
D.A	0	1	1	1	0	3	3.00
D.T	0	0	1	0	2	3	4.33
C.O	0	0	0	0	3	3	5.00
S.T.D	0	0	0	0	3	3	5.00
A.R.T.D	0	0	0	1	2	3	4.66
F.T.D	0	1	0	0	2	3	4.00
Informally trained							
D.A	1	3	0	0	0	4	1.75
D.T	0	1	1	2	0	4	3.25
C.O	0	0	3	1	0	4	3.25
S.T.D	0	1	1	2	0	4	3.25
A.R.T.D	0	1	0	2	1	4	3.75
F.T.D	1	0	1	2	0	4	3.00

a statistically significant difference existed between the two groups is presented in Table 3.

The result from Table 3 indicates that when it comes to designing with dart manipulation principle, there is a statistically significant difference between formally trained dressmakers and informally trained dressmakers. Thus, the performance of dressmakers who have been formally trained in dressmaking (M=26.00, S.D=3.86) is better than the performance of dressmakers who received informal training in dressmaking. This could be attributed to the fact that those who received their training through the formal setting had better understanding of that dart principle than the other group. Therefore, the null hypothesis which stated that there is no significant difference between formally trained and informally trained dressmakers with the use of dart manipulation in garment designing was rejected.

Results for the comparison of formally and informally trained dressmakers with the application of added fullness principle (Design 2) in garment designing

The application of added fullness principle in garment designing (Design 2) basically requires the garment producer to depict an increase fullness that is greater than the dart excess, then, add within and/or outside the pattern's frame where the fullness is needed (Aldrich, 1994; Hollen and Kundel, 1992; Joseph-Armstrong, 2010). Table 4 indicates that the mean scores of formally trained dressmakers in design analysis (M=3.33), dart manipulation (M=4.33), cutting out (M=5.00), sewing (M=4.33), achieving a replica (M=4.00), fit of test design (M=3.66); and that of informally trained dressmakers in design analysis (M=1.50), dart manipulation (M=2.25), cutting out (M=3.25), sewing (M=3.25), achieving a

Table 3. Means, Standard deviations, *T*-values and *p*-values for the application of dart manipulation in garment designing by the two groups of dressmakers.

Form of training	N	M	SD	df	t – value	p − value
Formal	3	26.00	3.86	5	-2.864	0.035
Informal	4	18.22	3.00			

**significant p=<0.05, M=Mean, SD=Standard Deviation.

Table 4. Mean scores on the comparison of formally and informally trained dressmakers with the application of added fullness principle (Design 2).

Assessment of test Design 2	1	2	3	4	5	Total	Mean score
	No.	No.	No.	No.	No.	No.	
Formally trained							
D.A	0	1	0	2	0	3	3.33
D.T	0	0	0	2	1	3	4.33
C.O	0	0	0	0	3	3	5.00
S.T.D	0	0	1	0	2	3	4.33
A.R.T.D	0	0	1	1	1	3	4.00
F.T.D	1	0	0	0	2	3	3.66
Informally trained							
D.A	3	0	1	0	0	4	1.50
D.T	1	1	2	0	0	4	2.55
C.O	0	1	1	2	0	4	3.25
S.T.D	0	0	3	1	0	4	3.25
A.R.T.D	0	1	1	2	0	4	3.25
F.T.D	2	0	0	2	0	4	2.57

replica (M=3.25), and fit of test design (M=2.57) indicate that differences existed between the two groups. A close look at the mean score of both groups with reference to cutting out of test design 2 shows that, formally trained dressmakers were able to cut out the test design flawlessly whereas the informally trained dressmakers faced some difficulties in this aspect. Among the difficulties that were observed included their inability to transfer required measurements onto the fabric as dictated by the design and also, their inability to acknowledge the need for blending and trueing for perfect curves and lines. Interestingly, it was observed that the fit of design 2 fitted well on models of both groups of dressmakers.

To find out if statistically, significant differences existed between the two groups with the application of added fullness principle, Table 5 depicts the statistical outcome of the test. Results in Table 5 show that, there is no significant difference between the two groups when it comes to the areas of interest. This indicates that both groups were familiar with the application of added fullness principle in garment designing. As indicated in Table 5, the result is consistent with null hypothesis 2 which stated that there is no significant difference between formally trained dressmakers and informally trained dressmakers with the application of added fullness principle in garment designing thus, p= (.063). Therefore, the researchers failed to reject hypothesis 2. However, the mean statistics shows that, between the two groups, formally trained dressmakers had a higher mean (M=24.67) than that of informally trained dressmakers (M-16.25). The no statistically significant result may be attributed to the fact that both groups of dress makers had their test garments fitting well on their models even though those who were informally trained had few challenges with the design.

Results for formally and informally trained dressmakers with the application of dart contouring principle (Design 3) in garment designing

With the application of contouring principle in garment designing (Design 3), the general performance of both group was lower than their performance in the application of dart manipulation and added fullness principles. Irrespective of this, there were differences between the two groups as the mean scores of formally trained

Table 5. Means, standard deviations, *T*-values and *P*-values for the application of added fullness in garment designing by two groups of dressmakers.

Form of training	N	M	SD	df	t – value	p − value
Formal	3	24.67	1.53	5	-2.253	0.063
Informal	4	16.25	5.50			

**Significant p<0.05, M=Mean, SD=Standard Deviation.

Table 6. Mean scores for formally and informally trained dressmakers with the application of dart contouring principle (Design 3) in garment designing.

Assessment of test Design 3	1	2	3	4	5	Total	Mean score
	No.	No.	No.	No.	No.	No.	
Formally trained							
D.A	1	0	1	1	0	3	2.67
D.T	0	1	2	0	0	3	2.66
C.O	0	0	0	0	3	3	5.00
S.T.D	0	0	0	2	1	3	4.33
A.R.T.D	0	0	1	2	0	3	3.66
F.T.D	1	0	0	0	2	3	3.66
Informally trained							
D.A	4	0	0	0	0	4	1.00
D.T	3	1	0	0	0	4	1.25
C.O	1	0	1	2	0	4	3.00
S.T.D	0	0	4	0	0	4	3.00
A.R.T.D	1	1	1	1	0	4	2.50
F.T.D	1	2	1	0	0	4	2.00

dressmakers in design analysis (M=2.67), dart treatment (M=2.66), cutting out (M=5.00), sewing (M=4.33), achieving a replica (M=3.66), and fit of test design (M=3.66) were higher than the mean scores of informally trained dressmakers in design analysis (M=1.00), dart treatment (M=1.25), cutting out (M=3.00), sewing (M=3.00), achieving a replica (M=2.50), and fit of test design (M=2.00) (Table 6).

With reference to the dart treatment, both groups performed abysmally and it was reflected in the fit of the test design even though the fit of the contoured design on formally trained dressmakers' models were better than models of informally trained dressmakers. The application of this principle in garment designing requires the dressmaker to reduce the pattern within its frame so that the desired effect can be achieved. However, it was observed that, darts in the contoured design were treated the same way as dart in the dart manipulation design by informally trained dressmakers without any thought of reduction within the pattern's frame. This indicates that they had no knowledge about the use of contouring in garment designing. It was also observed that, the formally trained dressmakers made use of working paper pattern with the application of contouring principle in garment designing. However, there were some mistakes that were observed during size adjustments of the working paper pattern. It was observed that dressmakers were reducing the frame of the working paper pattern from the outside (outline) instead of reducing the frame from within. To determine if these differences in mean scores between the two groups were statistically significant, the independent samples *t*-test was employed and the outcome of the test is presented in Table 7.

Table 7 shows statistically significant differences between formally and informally trained dressmakers (p=0.005). The mean statistics in Table 7 show that the formally trained participants performed better than the informally trained ones. The result was not in agreement with the null hypothesis; therefore the null hypothesis was rejected. The principle of contouring is basically applied if a dressmaker wants to create a design that fits the contours of the upper torso. In using this principle, the pattern must be reduced within its frame to fit the dimensions of the body as dictated by the design. From Table 6, even though the means of formally trained dressmakers with respect to design analysis, dart

Table 7. Means, Standard Deviations, *T*-values and *P*-values for the application of contouring in garment designing by two groups of dressmakers.

Form of training	N	M	SD	df	t – value	p − value
Formal	3	22.00	3.20	5	-4.732	0.005
Informal	4	12.75	1.00			

**Significant p<0.05, M=Mean, SD=Standard Deviation.

manipulation and fit of test design were better than informally trained dressmakers, it is clear that both groups had difficulties in the aforementioned areas as compared to the mean scores that were recorded for dart manipulation principle and added fullness principle.

Conclusion

From the findings of this study, it can be concluded that differences exist between formally and informally trained dressmakers with regard to the application of the three principles of dart use in garment designing examined in this study. In all the dart principles examined, the formally trained dressmakers performed better than the informally trained ones. This indicates that the application of theory to practice is very much important when it comes to the teaching and learning of garment making skills. The dressmakers that are formally trained are more likely to apply dart principles to produce designs that are trendy, pleasing to their customers fashion sense and fit better than their informally trained counterparts.

RECOMMENDATIONS

Based on the outcome of the study, it is recommended that the dressmakers and tailors association incorporate a little theory on the preliminary stages involved in garment designing such as dart use into the framework they use in training apprentices. This will enable apprentices who will establish their own apparel production industry in the future, treat preliminary stages with much importance. In addition, basic instructions needed to construct garments with the application of dart principles should be documented in simple terms and illustrations to aid dressmakers in their every day work. This should be done by experts in the fashion industry to enable dressmakers to experiment with dart principles to become more creative.

Furthermore, an attempt should be made by individuals in the clothing and textiles field of study, to investigate how dressmakers understand other factors like matching styles with appropriate fabric type, laying out or plotting pattern pieces in appropriate directions and seaming that also contribute to the achievement of variety of fashionable designs and effective fit. This will give an overall picture of how dressmakers understand and practice garment designing.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

REFERENCES

Aldrich W (1994). Metric pattern cutting for women's wear. Oxford: Blackwell Science.

Baker MM (2007). Darts, Ease, Gathers, Pleats, Shirring, Tucks. University of Kenturky Cooperative Extension. Retrieved July 20, 2013 from http://www2.ca.uky.edu/hes/fcs/factshts/ct-mmb-182.pdf

Bortei-Doku AE, Doh D, Andoh P (2011). Study of Attitudes towards Technical and Vocational Education and Training in Ghana. Centre for Social Policy Studies, University of Ghana.

Brown P, Rice J (2001). Ready-to-wear apparel analysis (3rd ed.). Prentice Hall: Pearson Education, Inc.

Fischer A (2009). Basic Fashion Design 03, construction. Switzerland: AVA Publishing SA.

Forster P (2009). Freehand cutting made easy (2nd ed.). Accra, Ghana: MidlandPress Ltd.

Forster P, Ampong I (2012). Pattern cutting skills in small scale garment industries and teacher education universities in Ghana. International Journal of Vocational and Technical Education 4(2), 14-24.

Hollen RN, Kundel JC (1992). Pattern making, by the flat method. New York: Macmillan Publishing Company.

Joseph-Armstrong H (2010). Pattern Making for Fashion Design (5th ed). New Jersey: Pearson Education, Inc.

Keiser JS, Garner BM (2003). Beyond design. New York: Fairchild Publication Inc.

Leedy PD, Ormrod JE (2010). Practical Research Planning Design. New Jersey: Pearson Education Inc.

Related Journals: