American Journal of Business and Society
Vol. 5, No. 4, 2020, pp. 178-185
http://www.aiscience.org/journal/ajbs

Comparative Analysis of Fabrics: Structural Attributes of Akosombo Textile Limited (ATL) and Dong Yu Textile Company Limited (DYTCL) Kente Prints

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Abstract

The study examined the differences in the structural attributes of Akosombo Textile Limited (ATL) and Dong Yu Textile Company Limited (DYTCL) Kente fabrics. A Factorial design was used for the study. Two printed Kente fabrics from Akosombo Textiles Limited (ATL) and Dong Yu Textile Company Limited (DYTCL) were sampled for the study. The lottery method sampling technique was used to sample 409 specimens from the two selected fabrics. Data were analysed using Statistical Package for Service Solution (SPSS) software version 16.0. An independent sample t-test analysis was conducted to determine if differences in the means of the thread counts of the Kente prints from the two manufacturing companies were significant at.05 significance level. The data were presented using tables of frequencies and percentages as well as, means and standard deviations were employed to describe the structural attributes of the two fabrics. The findings indicated that ATL Kente fabric had higher number of thread counts than those from DYTCL. The study also revealed that Kente print from ATL weighed heavier than those from DYTCL. It is recommended that, DYTCL should improve the structural attributes of their Kente prints to guarantee quality and durability specifications.

Keywords

Fabrics, Akosombo Textile Limited, Dong Yu Textile Company Limited, Kente

Received: July 26, 2020 / Accepted: August 20, 2020 / Published online: November 23, 2020

1. Introduction and Background

The origin of Kente dates back to the 12th Century in Africa, specifically in Ghana [1]. Indigenous Ghanaian "Kente" is a ceremonial cloth which is either hand woven on a horizontal treadle loom or produced using industrial machines. It comes in strips, measuring about four inches wide, which are sewn together into larger pieces of cloth. It is a century old tradition of strip weaving which comes in variety of colours, sizes, fibres and different intricate motifs or designs [1].

Kente weaving was inspired by the demands of royalty, ceremony and the aesthetic taste of the wealthy [2]. Kente cloth received its name from the term "Kenten" in the Akan language of Ghana which means "basket", because of the cloth's resemblance to the woven design of a basket. Ofori-Ansa indicated that Ghana's weavers used looms to make four-inch-wide strips of Kente cloth, and wove the strips together to form a larger fabric. Coming in various colours, sizes, fibres and designs, Kente designs have deep symbolic meaning. Its custom design nature gives room for various moods and ideas to be expressed in the designs.

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Kente cloth is of much importance in the Ghanaian social and religious settings. Right from historic times, Kente has been worn by kings, queens and important figures of state in the Ghanaian society during ceremonial events and special occasions such as festivals and other sacred celebrations. In a cultural or traditional context, Kente is more important than just a cloth. It is a visual representation of history, philosophy, ethics, oral literature, moral values, social code of conducts, religious beliefs, political thoughts and aesthetic principles in African culture. It is also given as a special gift item or clothing for child naming, puberty rites, marriage, graduations, soul cleansing, burial and ancestral remembrance ceremonies. In view of its value and use, production were controlled to prevent people from using it for daily or common activities, or worn as ordinary wear [3].

Over time, the use of Kente has gained tremendous international recognition and has become one of the tangible manifestations of an ever-growing sense of Pan Africanism [2]. Contemporary uses of Kente include hat, scarf, tie and stole, thus weakening the sacred order of the use of Kente [1]. However, this situation arose due to the influx of printed Kente fabric which is an imitation of the designs in the traditionally hand-woven Kente [3]. The situation is also attributed to the much cheaper and more accessible nature of the printed Kente fabrics, as well as its cotton origin which permits it to be put into relatively varied uses. Nonetheless, the rational consumer is very much concerned about the durability of a fabric and how well it would appeal to the public when worn before a purchase of any fabric is made [4]. This suggests that consumers make decisions concerning the properties of a fabric in relation to its performance and maintenance before and during purchase of the fabric.

Basically, the differences in the structural attributes (weight, thread count and weave type) of fabrics are likely to cause differences in the performance of textile fabrics [5]. The physical characteristics of non-woven fabrics such as softness, flexible handle, high drape and bulk, conformability and mouldability affect the durability of fabrics [6]. However, the authors pointed out that the characteristics of fabrics can be engineered according to the end use - requirements.

Fabric performance is influenced by a number of variables that occur both in pre-consumer and post-consumer period. Fibre quality, yarn formation, fabric construction, textile wet processes and consumer washing processes can all have an influence on fabric performances [7]. The durability of a fabric means, among others, the fabric's ability to stand up to washing and sterilisation techniques, as well as the deformation resistance of the fabric. They cautioned that yarns break at the weakest element thus resulting in high breakages in further processes like laundry [8].

Ghanaians hold the hand-woven Kente fabric in high esteem to show their uniqueness and pride. They wear the fabric only during important occasions. The cloth is only dry cleaned so it does not pose any serious concern when it comes to laundry effects. The nature of the printed fabric cloth however lends itself to frequent washing which is likely to affect the durability of the fabric, thus a matter of concern. Consumers' choice of printed Kente fabrics, whether Ghanaian made by Akosombo Textile Limited (ATL) or the imported one, mostly made by Dong Yu Textile Company Limited (DYTCL) from China, will therefore depend on the durability of the fabric

Although hand-woven Kente originated from Ghana, the country is both a producer and an importer of printed Kente fabrics. The use of the local and imported printed Kente fabrics have become widespread following their many advantages over the hand-woven Kente [3]. The Ghana Standards Authority (GSA) attests to the fact that the locally printed Kente fabric by ATL of Ghana meets the textile standards set in Ghana Standards (GS) 124 2005. However, the same standards cannot be said of the imported printed Kente fabrics made by DYTCL of China, as the laws restricting the importation of fabrics into the country are not enforced. These imported fabrics therefore find their way into the Ghanaian market through various means, making it impossible for standard testing of the structural attributes of the two fabrics. The study sought to assess differences in the physical properties between the locally printed Kente fabric by ATL and the imported printed Kente fabric by DYTCL from China. The study was guided by this research question - Identify the structural attributes of ATL and DYTCL Kente fabrics.

2. Review of the Literature

Weaving is one of the indigenous crafts, very common in the Ghanaian tradition [9]. Kente the pride of Ghana traditional clothing is very colourful, its patterns full of Ghanaian traditional proverbs [10]. This craft is very much associated with three Regions in Ghana. These are the Volta Region in the southern sector, Ashanti Region in the middle sector and Northern Region in the northern sector. Prominent areas within these regions are Avetime Kpetoe in the Volta Region, Bonwire in the Ashanti Region and Daboya in the Northern Region. Woven fabrics produced from each of these areas possess specific characteristics different from each other [9]

The Asantes of Ghana have couturier for the monsoon and tropical seasons in West Africa. The Ashanti people design "Kente" cloth. Kente cloth is fabricated by men into limited strips that are later fastened by sewing to make larger cloths. They convey their meaning by contours that are quite diverse. Kente is tightly woven into colourful fabrics and it is woven for special occasions like weddings, funerals as a sign of royalty. The woven strips are six feet long and five to six feet wide. Traditionally the size, pattern and colours are selected by the gender, age, marital status and social status of the person using it. There are about 300 varieties of designs and each are named uniquely. Kente cloth remains as a symbol of pride to their motherland [11].

Asante Kente is a richly coloured, intricately patterned indigenous hand woven fabric that is typically produced at Bonwire and Adanwomase in the Ashanti Region Ghana. Kente is woven in long narrow strips with brightly coloured silk or cotton yarns on Nsadua Kofi, the traditional narrow loom, which is a box-like wooden structure in which the weaver sits to weave. The strips are sewn together lengthways to purposely create definite patterns in the constructed cloth. Asante Kente motifs and cloth designs have names with philosophical meanings and colour symbolism that serve as a medium of communication to the indigenes. The cloth designs consist of dots, lines, shapes, textures and colours that are carefully crafted to form geometric shapes and intricate patterns that exhibit balance, rhythm, variety, proportion and repetition. Unlike Asante Kente cloth with designs that evolve on the loom, weaving in the higher education textiles curriculum requires expression of the structure of design concepts as drafts on point paper [12, 13]

The rich culture of Kente cloth has been kept for centuries and its traditional use by chiefs is shifting to the everyday person who uses innovative products by local seamstresses. The innovative products of Kente cloth is in its infantile stage as this paper has shown through the study of consumers' preference of Kente innovative products and further uses of Kente cloth [10].

Furthermore, the study establishes that the Kente cloth is very colourful suitable for all occasion but very weighty. The weighty nature can be traced to the threads used to weave them particularly ones using cotton yarns followed by synthetic fiber yarns, polyester and nylon that mimic silk. The use of silk fiber yarns were previously preferred and highly prized and price. Although textiles companies have tried to print Kente designs on other materials, its quality looks much inferior as compared to the one woven, this calls for further studies and research into Kente cloth's weight reduction. In fact, with the advent of computerized looms it should make it possible for a study to create a mathematical iteration coded into end use of computer graphics for Kente patterns/designs to be woven on reengineered industrial weaving machines. Participants agreed that the weaving quality of Kente cloth is of high class and weavers should pay more attention when sewing the Kente strips together. In terms of the cost of purchasing and producing Kente cloth participants were of the view that it's very moderate. meaning all Ghanaians can afford Kente cloth if produced in large quantities. If Kente weavers can increase their production rate, their sales will improve which may further boost their business since demand for Kente cloth does out strip its supply [10]

Africa is a huge country which is the home to hundreds of different ethnic people who speak over seven hundred languages. The creativity of these natives is displayed by their adaptation to habitat and development in unique textiles. The production of these textiles takes most amounts of time and effort. These textiles bring out their ideas and indigenous beliefs. Now days, Kente cloth is adopted as a fashion statement by the people rather than exhibiting their royalty and these Kente designs are available with printed geometric patterns. The narrow strips of fabrics are woven by using double heddle looms. The weaving machines are of simple construct that they hold sets of yarns in pull as this arrangement has no pull on the warp beam so load is used to give pull during weaving. Weaving is also the skilful technique that is known in Ghana. Before the introduction of weaving in Ghana they used materials from bark of the kyenkyen tree. Limited bits of kyenkyen bark is mollified in water and beaten over trunks of fallen trees with wooden hammers into another adaptable material that was utilized as a covering. At the point when cotton and expensive silk fabrics came into the Gold Coast from Europe and Asia the Asante individuals disentangled the yarns and skilfully wove them into lavish Kente materials of the considerable number of assortments of shading and example. Kente stayed as an indication of sovereignty and affluent when they are woven with silk yarns. Asante Kente is a woven fabric that is recognized by its stunning, multi-shaded examples of brilliant hues, geometric shapes and strong structures. It likewise speaks to what depicts as the 'imaginative, attentive or creator's woven fabric. Kente is absolutely the most extreme popular and top notch respected of every African material because of the reality it is created in additional segments, traded to additional spots, and fused into a more noteworthy decent variety of structures than some other African texture. Asante Kente has likewise caught the consideration of guests since at any rate 1817 as a material of wonder, of extreme cost and mind blowing size and weight [11].

Kente which is also known as Asante Kente is characterized by the geometric shapes with bright colours along the length of the fabric [11]. The patterns found in the weaves are geometric shapes like rectangle, diamond, zigzag and square. The designs applied on the fabric are dramatic and visually stunning. But the designs and colours involved show a wide range of variations in the meaning. Those colours that are used in the cloth convey some message, proverb or the idea of the weaver. The cloth they weave symbolizes democracy, unity, responsibility, royalty, ingenuity, excellence, elegance, wealth, perfection and superior craftsmanship etc., the warp and weft threads used in weaving of Kente cloth are uniquely woven and they have their distinctive name and meaning. Adweneasa is the name of the cloth which is especially used for the kings. And the largest known Kente cloth is “TikneNokoAdjina” means “one head cannot go into the council” handover to United Nations by an earlier Ghanaian head of state. These names are assigned by some special personalities, religious and cultural beliefs and political ideologies [11].

Once the filling yarns have been prepared and the warp yarns have been set in place, the loom goes through the primary principles of weaving: that is Shedding, Picking, Beating Up and Letting off [14, 15]. The shed is formed by raising the harnesses to form an open area between the sets of warps. The formation of the shed is known as shedding. While the shed is open, the yarn is transported across the opening to lay a filling yarn across the width of the loom. The insertion of the filling is known as picking. A single 38 filling yarn is known as a pick. Speed of weaving machines is generally expressed as the number of picks per minute or meters of filling inserted per minute. Speed obviously is related to the width of the loom and wider looms; weaving wider fabrics, would require more time for one filling insertion. Beating up is done with the reed, the comb like device that pushes the filling yarn close against the woven fabric (to the fell of the cloth) so as to make it more compact. As the woven fabric is formed, it must be moved or let off from the warp beam and taken up on the cloth beam to make room for the formation of more fabrics [15]. All these functions are harmonised so that they occur in the appropriate sequence and do not interfere with one another [14]

Notably, the yarn count has a negative effect on the yarn tenacity, while the twist multiplier (in the considered range) positively influence the yarn tenacity which is attributed to the increased cohesion between the fibres resulting in greater binding of the fibres into the body of the yarn [16]. The obliquity effect seemed to be negligible as compared to the resistance to slippage in the considered range of twist multiplier. Although this trend was observed for both the ring and the rotor yarns, the ring yarns were stronger than rotor yarns [16]. Both the yarn count and the twist multiplier seemed to have a negative influence on the diameter of yarns which may be attributed to individual fibres getting more closely tucked in the yarn body at higher count and a higher twist multiplier [17]. The response surface equations for tensile strength show, that in both the warp and the weft direction, the count exerts a negative effect on the tensile strength, whereas the twist multiplier had a positive effect on it [16]

The yarn tensile strength and diameter are dependent on the structural parameters of the yarn such as count and twist multiplier, besides the fibre characteristics [18]. The influence of the count and twist multiplier varies with the different forms of spinning. Broughton et al. believe that an open end or rotor yarn with a similar count and twist multiplier as that of a conventional ring spun yarn does not have a similar strength profile, due to the difference in the fibre orientation and fibre cohesion in the different yarn systems. These yarn characteristics further determine the performance properties of the fabric woven from them [19].

3. Methodology

Factorial design was used for the study. Two printed Kente fabrics from the two different manufacturing companies. The selected Kente fabrics were printed fabrics from Akosombo Textiles Limited (ATL), a local Kente fabric printing company, and Dong Yu Textile Company Limited (DYTCL) which is a China Kente fabric printing company. The study population comprised locally printed Kente fabrics from Akosombo Textiles Limited (Ghana) and China printed Kente fabrics from the Dong Yu Textile Company Limited. The label on ATL printed Kente fabric was ‘Guaranteed Superb Prints RSP2993’ and that of DYTCL printed Kente fabric was ‘Guaranteed Superb Prints 29848’. Six yards of DYTCL and six yards of ATL printed Kente prints (same Colours) were obtained from the market from which the samples were obtained and from each of the prints, a total of 409 specimens were obtained.

The lottery method sampling technique was used to sample the 918 specimens from the two selected fabrics. The specimens were first grouped into two categories, which were specimens from ATL printed Kente and specimens from DYTCL printed Kente. Each category specimens were further grouped into warp and weft specimens. A pair of scissors was used in cutting the specimens for the two fabrics, while a Pattern Cutter was used to cut the fabrics into uniform round shapes for use in determining their weights.

Data were analysed using Statistical Package for Service Solution (SPSS) software version 16.0 of independent sample t-test. The data were presented using tables of frequencies and percentages. Also, means and standard deviations were employed to describe the structural attributes of the two fabrics. An independent sample t-test analysis was conducted to determine if differences in the means of the thread counts of the Kente prints from the two manufacturing companies were significant at.05 significance level.

4. Findings and Discussions

This section presents findings and discussions on identify the structural attributes of ATL and DYTCL Kente fabrics. The section dwells on the assessment of thread counts and the weight of the fabrics. The importance of investigating structural attributes of the printed clothes was based on the main argument of the basic fibre theory, is the rate which the tensile strength or colour of fabrics depreciate during stress tests such as washing greatly depends on the properties and characteristics of the fibres used [17]. The assessment of the potential capacity of the Kente prints to resist tensile related deformations as described as the number of thread counts of fabrics significantly determined their potential capacity to resist stress-related deformation [16]. The weight of the fabrics on the other hand, was necessary because it is perceived among consumers that heavy weight fabrics perform better than light weight ones in their usage. The weave types of the fabrics were also assessed because differences in the weave type could give an indication of differences in the performance of fabrics after undergoing uniaxial testing [17]. The findings, analyses and discussions of the structural attributes of the fabrics were categorised under ATL printed Kente fabric and printed Kente fabric of DYTCL.

4.1. Thread Counts of Printed Kente Fabrics from ATL and DYTCL

An examination of the number of threads in the fabrics, that is, the thread count of printed Kente fabrics of ATL and DYTCL were done. The implication was that differences in structural attributes of fabrics may explain differences in their performances when subjected to uniaxial test and also the structural attributes of fabrics significantly determine the quality or durability of fabrics [17]. Thread count of ATL printed Kente fabric: Details of the thread counts of ATL Kente print from both warp and weft yarn directions are presented in Table 1.

Data in Table 1 shows that the thread count at the warp yarn direction of the Kente print from ATL ranged between 91 and 105 counts. The mean thread count at the warp yarn direction of the Kente print from ATL was 98 with a standard deviation of 5.1. The 5.1 standard deviation showed that the various thread counts closely surrounded the mean. The implication was that the mean thread count was a reliable representation of the various thread counts.

Table 1. Thread Count of ATL Printed Kente Fabric.

Number of counts	Warp	Weft
First count	96	85
Second count	91	83
Third count	99	87
Fourth count	105	80
Fifth count	99	78

Mean thread count 98 83
Standard deviation (warp = 5.1; weft = 3.7)
Source: Laboratory Results, 2011

Table 1 further shows that the thread count at the weft yarn direction of ATL Kente print ranged from 78 to 87 counts. The mean thread count at the weft yarn direction of ATL Kente print was 83 with a standard deviation of 3.7. The 3.7 standard deviation shows that the mean thread count at the weft yarn direction did not deviate much from the observed thread counts at the various counting cycles. The small deviations around the mean made the mean thread count a reliable representation of the various thread counts.

Comparing a standard deviation of 5.1 for warp and 3.7 for weft standard deviations, the implication was that mean of the thread counts at the weft yarn direction was a better representation of the thread counts at the various counting sessions than that of the warp yarn direction. The thread counts between warp and weft yarn directions of ATL Kente print at the various counting sessions showed that there were more thread counts at the warp yarn directions in all the sessions than those in the weft yarn directions. Having more thread counts at the warp direction implied that the fabric would have greater resistance at the warp yarn direction than the weft yarn direction during tensile strength testing as described in the basic fibre theory as the number of thread counts of fabrics significantly determined their potential capacity to resist stress-related deformation [15, 16]. The findings again support the theory that the number of threads in a fabric partly determines its resistance capacity during uniaxial testing [4]. The findings also confirmed other assertions that, the warp yarn direction of fabrics were stronger and might pose much resistance to stress-related deformation than the weft yarn direction [4, 16].

The next examination concentrated on the thread counts in both warp and weft yarn directions of the Kente print from DYTCL. The aim was to examine the potential capacity of Kente print from DYTCL to resist stress related deformation. Results of the thread counts of Kente print from DYTCL are presented in Table 2. The data, as tabulated in Table 2, indicate that the thread count of the Kente print from DYTCL at the warp yarn direction ranged between 75 and 82 counts. The mean thread count at the warp yarn direction over the five thread count sessions was 80 with a standard deviation of 2.8. The thread count of the Kente print at the weft yarn direction also ranged from 69 to 75 counts. The mean thread count at the weft yarn direction over the five thread count sessions had a standard deviation of 2.7.

Table 2. Thread Counts of Printed Kente Fabric from DYTCL.

Number of counts	Warp	Weft
First count	75	75
Second count	81	69
Third count	81	75
Fourth count	82	75
Fifth count	80	75

Mean thread count 80 74
Standard deviation (warp = 2.8; weft = 2.7)

A comparison of the thread counts of the warp yarn direction to that of the weft yarn direction of the printed Kente fabric from DYTCL showed 75, the lowest number of counts at the warp yarn direction was the highest number of thread counts at the weft yarn direction. The results of the comparison showed that there were more thread counts in the warp yarn direction than at the weft yarn direction. The implication was that the fabric was likely to possess more capacity to resist stress at the warp yarn direction than at the weft yarn direction. The results corroborate with the argument that; the greater number of thread counts at the warp yarn directions of fabrics compared to the weft yarn directions made the warp yarns stronger in terms of resistance to tensile test than the weft yarns [4]. When the thread counts, which were taken from both the warp and weft yarns directions of the Kente prints from the two textile manufacturing companies were observed to find out if there were observable significant differences between the thread counts of the Kente prints from ATL and those from DYTCL under the manual lens, the thread layout of ATL Kente looked straight and evenly spaced. However, the yarns of the Kente print from DYTCL looked like jute, not straight, and were widely and unevenly spaced.

Comparing the thread counts of the Kente prints from the two textile manufacturing companies, it could be seen that the Kente print from ATL had a higher number of thread counts from both the warp and weft yarn directions than those of the Kente print of DYTCL. Thus, the thread counts of ATL Kente print were higher in all the counting sessions and at both yarn directions than those from the Kente print of DYTCL. The implication was that ATL Kente print had a greater potential capacity to resist tensile-related deformation than Kente print of DYTCL [16]. According to them, the higher the number of thread counts a fabric has, the greater is its potential capacity to resist deformations resulting from tension. A critical look at the thread counts of the two fabrics showed that there were more thread counts at the weft yarn directions of ATL printed Kente fabric than the warp yarn directions of the printed Kente fabric of DYTCL. This showed that the weft yarn direction, which was the weaker part of ATL, had a higher potential capacity to resist stress-related deformations than the warp yarn direction, which was the stronger yarns of Kente print from DYTCL, as in all woven fabrics.

4.2. Significant Difference in Thread Count Between ATL and DYTCL Kente Prints

The study assessed whether the differences in thread counts between ATL Kente print and Kente print from DYTCL were statistically significant. This was to find out whether the observed differences in the thread counts between the Kente prints from the two textile manufacturing companies were significant enough to cause appreciable differences in their usage. An independent sample t-test analysis was conducted to determine if differences in the means of the thread counts of the Kente prints from the two manufacturing companies were significant at.05 significance level. Table 3 presents the results of the independent sample t-test.

Table 3. Test of Differences in Thread Count between ATL Kente Print and Kente Print from DYTCL.

Yarn	df	Mean diff.	SE of diff	Pooled SD	t-statistic	P-value
Warp	8	18.2	2.6	4.1	7.01	0.0001
Weft	8	8.8	2	3.2	4.4	0.003

Hypothesised difference = 0Significant at P-value of 0.05
Source: Laboratory Results, 2011

The information displayed in Table 3 shows that the test result was a pvalue of 0.0001 with a t-statistic of 7.01 at the warp yarn direction, and a pvalue of 0.003 with t-statistic of 4.4 at the weft yarn direction at a p-value of 0.05. The finding was that the significance levels of both the warp and weft yarn were lower than 0.05 and so were statistically significant. The p-values at both yarn directions were therefore within the acceptable margin of error of 0.05. The implication from this finding was that there were significant differences in thread counts in both yarn directions between the Kente fabrics of the two textile manufacturing companies. The significant differences in the structural attributes of fabrics such as thread counts, cause significant differences in their performance during stress tests [17]. This assertion implied that the significant differences in the thread counts of the Kente fabrics of the two manufacturing companies might cause significant differences in their performances during the uniaxial testing.

4.3. Weights of the Kente Prints from the Two Textile Manufacturing Companies

The weights of the Kente prints from the two textile manufacturing companies were also examined to ascertain whether there were significant differences. This was necessary since the structural attributes such as fabric weight, were used to explain differences in the behaviour of fabrics under uniaxial tension [20]. Details of the fabric weights are presented in Table 4.

Table 4. Fabric Weight of Kente Prints from ATL and DYTCL.

Specimens	ATL	DYTCL
First specimen	131.9g/m^2	101.3g/m^2
Second specimen	129.2g/m^2	98.7g/m^2

Mean fabric weight 130.6 g/m^{2}100g/m^2
Standard deviation (ATL = 1.9; DYTCL = 1.8)

Table 4 shows that the mean weight of the Kente print of ATL was 130.6 g/m^2 with a standard deviation of 1.9, while that of DYTCL was 100g/m^2 with a standard deviation of 1.8. It could be deduced from the figures in the table that the ATL Kente print is heavier than the Kente print of DYTCL. The difference may be attributed to the higher number of thread counts of the ATL Kente print as compared to the Kente print from DYTCL. The results thus prove that the number of thread counts partly determines the weight of fabrics [20]. An independent sample t-test was used to examine whether there were significant differences in the weight of the Kente fabrics from the two textile manufacturing companies. This examination was essential since it was aimed at assessing if the observed differences in the weights were significant enough to cause any significant differences under uniaxial testing. Results from the independent sample t-test yielded the following:

A p-value of 0.004 at 2 degrees of freedom;

A t-statistic value of 16.3;

A mean difference of 30.6;

A standard error difference of 1.9; A pooled standard deviation of 1.9; and

A hypothesised difference of 0.

Comparing the p-value of 0.004 to the alpha value of 0.05 implies that the difference in weight between the Kente prints from the two textile manufacturing companies was significant since the computed value of 0.004 was less than 0.005.

4.4. Types of Weave in the Two Fabrics

Another structural attribute of the printed Kente fabrics from the two textile manufacturing companies was the weave type. Knowing the weave type was very important since the type of weave of a fabric had influence on its performance during uniaxial testing. It was observed from the study that the Kente prints from both textile manufacturing companies were plain weave. The weave types of fabrics influenced cohesion between fibres, which in turn affected the performance of the fabrics during stress test [21]. Thus, the implication of the finding was that the weave type could not cause any significant differences in the uniaxial testing between the ATL Kente print and the Kente print of DYTCL.

5. Conclusions and Recommendations

The study concluded that, the Kente print from ATL had higher number of thread counts from both the warp and weft yarns than the warp and weft yarns of Kente print from DYTCL. Kente print from ATL also weighed heavier than those from DYTCL, rendering ATL Kente print heavier as compared to that of DYTCL. Kente prints from both textile manufacturing companies were plain weave.

It is recommended that, DYTCL should improve the structural attributes of their Kente prints to guarantee quality and durability specifications. Improvement in the structural attributes of the Kente print from DYTCL can be in the form of increasing the number of thread counts in the fabrics, and the arrangement of yarns. This will help to improve the durability of Kente print from DYTCL in their daily use.

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