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# Textural Semiotics of Ankara, Batik, and Lace Fabrics in Nigerian textiles

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#### Abstract

The paper analyzes the relevance of texture and symbols in Ankara, Batik, and Lace fabrics, conveying meanings, and communicating symbolic information on the fabrics to the users. The study examines the cultural significance and symbolic meanings embedded in the fabrics. Literature thrives on the origins, history, and usage of the fabrics. However, , there is a dearth of publications on the symbolic interpretation of the use of textures and symbols of Ankara, batik, and lace in Nigeria. The success of the objectives of this paper is achieved through the adoption of a descriptive design using qualitative methods to analyze the data. The article eventually illuminates the significance of signs and symbols in Ankara, batik, and lace fabrics as they contribute to documenting important designs in Nigerian culture and history. The research underscores the importance of preserving traditional textile techniques and promotes cross-cultural understanding and cultural preservation.

Keywords: fashion, symbols, textures, Ankara, Batik, Lace, textile semiotics

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#### 1. Introduction

Ankara fabric is a wax-resistant dyeing textile produced by machines. Ankara fabric is produced by a variety of signs and symbols derived from the African environment (Adeloye et.al. 2023; Adeoti and Kalilu 2024). Ankara is one of the commonly used African fabrics that is produced with various multicolours and elaborate patterns. It is otherwise regarded as wax print, designed with eye-catching colours of 100% cotton. Today, there are many identifiable appellations peculiar to Ankara fabrics such as Dutch wax, English wax, Veritable Java Print, and Holland wax among others (Oyedele and Obisesan 2013).

Ankara fabrics originated from India and later spread to Indonesia, while it was sold by Java. By and by, Ankara was introduced into the African business circle in Gold Coast by Pieter Fentener Van Vlissingon in 1846 in the Dutch industry. The Dutch soldiers influenced their acceptability among the African dwellers in West African countries. After some time, the fabric penetrates Nigerian markets (Adeoti and Kalilu 2024). However, Kuwonu (2020) observes that the Dutch manufacturer did not originally target Africans to produce the Ankara fabrics but the Indonesian markets. Ankara is not African-oriented, yet people consider it suitable for various occasions,

especially in Nigeria (Ajuonma 2009). Presently, Ankara largely remains one of the popular textile products among the Yoruba people of Nigeria (Akinwumi 2021).

Batik is a technique of using wax to resist dyeing. It is used to describe the textiles created with resist dyeing such as Ankara fabrics (Raffles 1817). The art is created by drawing or stamping on a fabric with wax to prevent dyes from penetrating certain areas of the fabric (Sunberg 2008). Some of the patterns in batik have symbolic significance for certain occasions, while some are used to satisfy the users of the fabric. Wax resist dyeing has been in practice since ancient times in countries like Egypt, Southern China, India, and Indonesia, especially in Java with the use of stamps (Gillow and Dawson 1995).

On the other hand, Lace fabric involves the interconnection of threads or yarn, manipulated into wearable fabrics with striking motifs developed in a rhythmic pattern. Lace fabrics have evolved over the centuries and pose as fabrics for all seasons by the nature of their sophistication, intricate patterns, and charming textural effect (Plakensteiner 2013; Aishwariya and Ramyabharathi 2023). Lace fabric is an old textile that emerged between 1400s and 1500s in the Austria Province of Vorarlberg (Kalilu and Adeoti, 2020). An increase in the demand for garments spurred the marketability of lace fabrics in the Nigerian markets, even though the name "lace" was derived from the Latin word "*lacina*", which means hem or fringe of garment" (Buckley 2009). Lace fabric is a subtle cotton material designed with a flexible and interwoven fiber in a decorative manner (Aishwariya and Ramyabharathi, 2023)

Moreover, texture plays an important role in the attraction of Ankara, Batik, and lace fabrics in Nigeria (Labode and Braide, 2022). Texture is regarded as the surface quality of objects in terms of physical composition, materials, design, technical properties, and surface values (Kodzoman *et.al* 2023). This textural element is a vital characteristic of Ankara, batik, and Lace fabrics (Balas and Green, 2023). Textural creation has been one of the avenues of embellishing objects to meet human desires and interests.

Balas and Green (2023) agree that textural quality is largely an interesting artistic element that invariably provokes choice for a particular form of artwork, be it in drawing, graphics, ceramics, or textiles. In textile production, the use of symbolic design is a great stimulus for people's demand for Ankara, batik, and lace fabrics in African society today. This is a result of certain visual information embedded in the textural elements of the fabrics. Lugbofer and Xeng (2015) assert that textures contain obvious imageries such as plants, foods, animals, and flowers. The use of these fabrics sometimes depends on the derivable aesthetic satisfaction of the textile materials (Yuian *et.al.* 2022). The most common types of motifs in any of these fabrics today are lines, flowers, objects, symbols, shapes, and stars, which invariably appear in a repetitive pattern (Aishwariya and Ramyabharathi, 2023).

#### 2. Study, Aim, and Objectives

The study focuses on analyzing the symbolic meaning and cultural significance of textures and patterns in traditional African (Ankara), Batik, and European (lace) fabrics and explores how textures and patterns convey cultural messages, values, and beliefs, and how they intersect across different cultural contexts to uncover the deeper meaning and significance of these fabrics beyond their aesthetic value. This is to remove the ambiguity that resulted in the misappropriation of the intrinsic and extrinsic values of the signs and symbols that overwhelmed the surface of the fabrics. Additionally, the objectives are to analyze and interpret the symbolic meanings in the patterns and textures of the three fabrics and to explore the significance of the fabrics in their cultural contexts. This will help to contribute to the cultural value of these fabrics. All these will guide the study in investigating the complex relationships between texture, culture, and meaning in traditional African and European fabrics to be documented in the annals of art history for future generations.

It has been observed that there is a misinterpretation of signs and symbols as well as the prevalent textures of Ankara, batik, and lace fabrics, among the users of the fabrics these days. Many of the textural semiotics of the fabrics have a direct or indirect meaning on African culture, tradition, belief, religion, aesthetics, and values. Therefore, the traditional textile designs and meanings will be preserved, promoted, and documented. The study

will encourage collaboration and dialogue between African and European cultural contexts. The study will also promote economic development and support sustainable textile industries will enhance cultural authenticity in textile production.

#### 3. Literature Review

Sauvet, et.al. (2018) examine the symbolic values of images and signs in the art of prehistoric people. Richard (2020); Riera (2020), and Yuian et.al. (2022) refer to semiotics as the study of signs and symbols in artworks such as sculpture, graphics, textiles, etc. Kalilu and Adeoti (2022) trace lace fabrics to Austria in the early fifteenth century. Lasisi et.al. (2022) survey Ankara fabric on how it thrives among the young and old of Western and African communities. The paper examines the attended development evolved during transition from the era of hand-woven techniques to the use of machines. Ayesu et.al. (2023) and Ampa-korsah et.al. (2024) base their findings on the cultural significance of textile materials in Ghana where various symbols were used having a direct and indirect meaning in the Ghanaian societies. Musa (2019) discusses the power of textural symbols to have a direct or indirect impact on the emotions, feelings, and attitudes of people. However, none of the authors considered the textural semiotics of Ankara, batik, and lace fabrics in Nigeria.

#### 4. Methodology

This article adopts a descriptive design to examine certain prevalent textural semiotics of Ankara, batik, and lace fabrics in Nigeria. The study considers the users and sellers of these fabrics. Data for this paper were collected from both primary and secondary sources. The primary source came from the unstructured interviews conducted with the users of these fabrics, the textile marketers, and personal observation of the creative use of textures, signs, and motifs, and the secondary source deals with the evaluation of the related articles. The collection of information was made possible through certain research instruments such as audio-visual recorders, instant cameras, and writing materials to record textile features and cultural context. The instruments are found to be reliable throughout the study. Additionally, a qualitative approach was used to analyze the art elements that form the basis of the fabrics.

#### 5. Results

#### 5.1. Meanings and Functions of common signs and symbols of Ankara and lace fabrics

According to Richard (2020), semiotics is the use of signs, symbols, or any object that can communicate ideas to the public. The symbols include stars, shapes, traffic signs, emojis, logos, letters, figures, objects, lines, colours, and a host of others (Riera 2020). Colour plays a significant role in African culture. White colour is used to represent purity, blue means love, green connotes buoyancy, red means warning or danger, while black is traditionally believed to imply evil or mourning. There are different colours in the designs of kente fabrics, whereby each colour, pattern, and design has its meaning. Blue connotes pure spirit and harmony, green means renewal, red stands for passion, gold stands for fertility, and black stands for union with ancestors or spiritual awareness (Oyairo 2020). The semiotic relevance of Ankara, batik, and Lace fabrics is of great influence on how individuals or groups conceptualize meaning, imperativeness, and usage for social purposes. According to Riera (2020), semiotics emanates from the Greek word "Semerio", which means "sign". Semiotics largely deals with how signs and symbols are used to convey messages to people. Simultaneously, the relevance of signs and symbols in fabrics cannot be undervalued.

Generically, fabric is one of the most admired materials of man's need for survival (Lasisi, et.al. 2022). The idea of textural semiotics in artworks can be examined from the angle of prehistoric art. Dutkiewiez et.al. (2020) and Yakar (2016) support that signs and symbols are integral parts of the several arts of prehistoric art. Over time, signs and symbols have played an operational role in communicating human emotions for the consistency of attitudinal behavior among the collective group of people (Sauvet et.al. 2018). As signs and symbols have

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assisted in the visual illustration of cultural mythology in prehistoric days, so it does to the African culture and identity in this recent time, especially in the textural quality of African fabrics.

#### 5.1.1. Textural Semiotics of Ankara Fabrics

Ankara fabrics from West Africa, particularly Nigeria, have rich textural semiotics that convey cultural meaning and significance. The visual elements in Adinkra symbols represent wisdom, strength, and community (Fig. 1). Regardless of the semiotic centeredness of the Ankara fabric, it is specially produced with a lot of chatty ideas (Adeloye et.al. 2023). The symbolic texture and colour qualities remain one of the elements of attraction for men and women in Africa. For the fact that it is African-centered, some of the signs and symbols are more culturally motivated in the African context than the Western (Oyedele and Obisesan 2013; Adeloye et.al. 2023). As of today, the knowledge of textural semiotics of Ankara, batik, and lace fabrics has advanced to the use of stones and synthetic beads to affect attractive gritty textures on these fabrics. Oyedele and Obisesan (2013) reiterate that beads personify honour, plants suggest the richness of African soil, while green colours connote buoyance and life. Other signs and symbols prominent in the fabrics are seeds, leaves, musical signs and instruments, environmental objects, lines, eye designs, etc. The eye design (Fig. 2) is used to depict God's eyes are everywhere, with no hiding place. God is Omnipotent, Omnipresent, Omni-vision. It portrays mystery and mysticism (Effiong 2015).



Figure 1: Adinkra symbols on a dressing hat



Figure 2: A man wearing an eye-design Ankara

The ancestral motifs depict tradition, and it honours heritage, and the geometric patterns signify balance, harmony, and unity. The designs on Ankara fabric signify cultural identity, community, and belonging. Contextually, the fabric is influenced by African traditions, history, and mythology. Socially, the designs reflect community values, status, and identity, and economically, production, trade, and cultural exchange are impactful. The intricate patterns, colours, and textures of Ankara fabrics embody the rich cultural narrative of West Africa, thereby making them a powerful symbol of African identity and heritage.

According to Adetona and Adiji (2023), there are lots of traditional motifs, symbols, and images from the ancient period that have been used as logographic properties of communication. Among these are Egyptian hieroglyphics, *Adinkra* of Ghana, Geez ideograms, and *Nsibidi* of Nigeria (Shaw 2004). For instance, Geez poses as the liturgical medium of communication among the Ethiopian Orthodox (Demilaw 2019). Also, the use of symbols is highly revered in the ancient art tradition of the Pharaonic Egyptians, even in other African countries. The force of the Egyptian hieroglyphs is highly articulated in other African States (Shaw 2004). Moreover, the history of the Egyptian hieroglyphs dates back to 3150 BC; precisely the fourth millennium BC (Kozlowska 2023). It is noteworthy that the hieroglyph characters were prominent in communication of the Egyptians to the

extent that the colourfulness of the script attracted the Arab travelers around AD 900s before the scripts dwindled in AD 356 as a result of the evolution of Christianity (Kozlowska 2023). The hieroglyphs featured different environmental objects, nature, and living things (Daly, n.d).

One of the world-renowned historical symbols today is the *Nsibidi* which was a popular ideogram in the precolonial age in Southeastern Nigeria (Nwosu 2010). It developed the use of tattoos as a structured symbol of communication dating back to 2000 C.E. while ideographic art of writing also evolved around 4000-5000 BC. The fame of *Nsibidi* is next to the Egyptian hieroglyphics' symbols of writing (Okpu 2015; Effiong 2015; and Etukudor 2020). The designs of *Nsibidi* find their way into African wax Prints (Figs 3 and 4).



Figure 3: An example of Nsibidi design on fabric



Figure 4: Another example of Nsibidi design on fabric

## 5.1.2. Textural Semiotics of Batik/Wax resist fabrics.

Batik is of Indonesian origin but finds its way into the African continent. Visually, there are some peculiar features of the fabric, making it African. There is a crackled texture on the batik, which also features in Ankara fabric (Nggusham 2017). The crackled effect symbolizes fragility but represents a life cycle, such as birth or growth. While the waxing is going on, some droplets are deliberately, at times, signifying creativity and spontaneity. The areas resisting dyes indicate control and precision, while the colour gradations signify transition and transformation.

The texture of the technique usually represents craftsmanship and tradition. It shows imperfections, making it unique and peculiar to probable human error, while the texture highlights visual interest (Ghartey et.al. 2022). Contextually, the culture is influenced by African and Indonesian traditions. Socially, the technique reflects community values and status, and economically, it impacts production. Some common designs and motifs in traditional batik are concentric circles and basket carriers (Fig 5). The concentric circle symbol (Fig 5a) is known as the king of all *Adinkra* symbols, and it is believed to be the inspiration for the design of other symbols. It is a symbol associated with kings, and it stands for authority, headship, and charisma. (Effiong 2015). The basket carrier (Fig. 5b) is also a linear adaptation to connote the basket signifying accommodation and carriage. This is a popular design generally used among artists for decoration or background. The square design (Fig. 6) is called the well-ventilated house in *Adinkra* symbols. It is a symbol of resilience and readiness to face the vicissitudes of life





Figure 5: Batik fabric with Adinkra symbols as design



Figure 5a: Concentric circles of Adinkra symbols on Batik



Figure 5b: Basket design of Adinkra symbols on Batik



Figure 6: Square design of Adinkra symbols on Batik

## 5.1.3. Textural semiotics of Lace fabric

Lace patterns often appear like a spider-web, by their technique which involves looping, twisting, and braiding of threads either with machine or handcrafting (Bello and Saleh 2021). It originates from Europe and possesses rich intricate patterns which symbolize elegance.

Prominent motifs in lace fabrics are floral designs that represent femininity and fragility, the geometric designs signify directive while the transparent nature of the fabric suggests delicacy. Other textural symbolic patterns include stars, crowns, shapes, and lines characterized by the production of Ankara, batik, and lace (Aishwariya and Ramyabharakathi 2023). Perhaps, it was an imitation of the *Kente* fabric of the Ghanaians that was rooted in

the traditional art technique. The *Kente* was initially decorated to replicate a spider web in the creative capability of legendary textile designers called Bonwire, Ota Kraban, and Ameyaw (Ayesu *et.al.* 2023).

The development of textural signs and symbols on lace fabric began around fifteenth and sixteenth centuries in Europe in the form of embroidery design (Kodzoman *et.al.* 2023). Although, fabric decoration had been a talk of the town in other part of African country specifically in Ghana since 11th century (Ayesu *et.al.* 2023).

Lace fabric is airy with light-weight texture which conveys refinement. The patterns on the fabric represent craftsmanship, though fragile, but it symbolizes emotional sensitivity. It is known to be of high quality and embodies traditional European craftsmanship which signifies wealth. Historically, it was reserved for nobility, and usually used as wedding attire, especially the veils. White lace usage at weddings symbolizes chastity, purity, and innocence, while black represents mourning. Generally, the complex nature and designs of the fabrics exemplify rich cultural descriptions, thereby making the fabrics a prevailing representation of extravagance, stylishness, and practice.

According to Jimoh *et.al.* (2020), the traditional craftsmen in Nigeria, developed their astuteness in the manipulation of different geometric motifs with the aid of beads, sequins, quills, strips, thread, crochet hooks, or needles to create embroidered designs on their garments such as *agbada*, *buba*, and *dansiki* (types of African traditional dress). Later, the lace fabric knowledge expanded to the creative attachment of braids of narrow shape, plaited to appear like objects at some strategic areas of fabric (Kodzoman *et.al.* 2023). The idea of fabric decoration achieved through textural signs and symbols is now an enduring fashion in Nigeria and a form of non-verbal communication between two or more people in the communities. With time, the booming of lace fabrics began around the sixteenth and seventeenth centuries (Aishwariyah and Ramyabharathi 2023). Today, the textural semiotics elements of lace, batik, and Ankara fabrics has been contributed to the widely acceptance of the fabrics among all the classes of people in Nigeria. The most common symbols of lace fabrics today are floral motifs and geometric shapes (Figs 7 and 8) which invariably appear in a repetitive form (Simisiri 2019).



Figure 7: Lace fabric with floral motif and transparent nature



Figure 8: Lace fabric with geometric shapes and heavy yarns

#### 5.2. Historical Lines of the use of Signs and Symbols in Ankara, Batik and Lace fabrics

The appreciation of textile materials has been noticed since the primordial age (Bello and Saleh 2021). Even though it is believed that Ankara fabric originated from India before its diffusion into Indonesian in the early nineteenth to the mid twentieth century (Odulate 2009; Nnewuihe 2020), yet, the technique of its production which is achieved with the use of industrial wax and dye chemical, is a progressive ideas of a traditional method of producing textile in the ancient time before the evolvement of Dutch Wax (Olanrewaju 2020; Adeoti 2023).

Willard (2004) argues that the usage of signs and symbols in the production of printed fabrics started during the colonial age in Nigeria, occasioned by the development of industrial chemicals from Western Europe. Study

reveals that the Ankara fabric was initially produced in a manual way as a hand-woven fabric around nineteenth century before the development of machine by the Belgian printer. The development was characterized by a lot of deficiencies. However, with a gradual effort and attempt, the deficiencies were removed and the fabric become ubiquitous in West African countries with the industrious skill of Dutch and European marketers (Lasisi *et.al.* 2022).

Oyairo (2020) and Debeli et.al. (2013) observe that, a good number of motifs used in African fabrics today originated from African proverbs, folklores, poems, and environmental natural elements like lines, flowers, plants, and leaves. Debeli et.al. (2013) indicates further that those signs and symbols were designed in African techniques in favour of the general interests of Africans. The recent development in African fabrics suggests that the textiles are epitomes of culture and heritage, laden with artistic motifs (Akinwumi 2021).

However, the prior richness of African colours and variety of attractive textures, encouraged the West African countries to transfer the primordial techniques of batik textile into the production of Ankara fabric (Oyedele and Obisesan 2013). In Nigeria today, these fabrics are found as suitable wears of all seasons for both young and old regardless of sex or status. Besides, people occasionally derive satisfaction in combining Ankara fabric with other materials because of the colourful nature, textures, and the intricate symbols and signs on the fabrics.

It is worthy of note that these three fabrics have been used to represent cultural heritage and identity. Motifs used for Ankara, batik and lace fabrics are found among the *Adinkra* symbols which indicate the interconnection of the patterns (Aladesanmi 2019). This means that European colonization has influenced the traditional designs and symbolism, there is reinterpretation as years go by, because the designers have reinterpreted the signs and symbols which has inspired global fashion. Therefore, there is an interplay between cultural heritage, colonial influence and contemporary reinterpretation.

### 5.3. Textural Relationship of Ankara, Batik, and Lace fabrics

These three fabrics have distinctive textural characteristics, yet they share an intriguing relationship. Ankara is smooth, crisp, and slightly stiff. The weave is tight, loose, and open, with intricate patterns and vibrant colours. Batik is soft and irregular, having loose or open weave like Ankara fabric with wax resist patterns, crackled effect, and subtle colour gradation. Lace is airy and lightweight, having intricate weave and openwork patterns with the surface of floral, or geometric designs (Oyedele and Obisesan 2013; Kalilu and Adeoti 2020; Adeloye et.al. 2023). Therefore, the crispiness of Ankara contrasts with the softness of batik and the delicacy of lace. Moreover, the three fabrics have intricate patterns and designs on their surface thereby making African, Asian and European to interconnect.

Visually, Ankara's bold patterns and vibrant colours (Kalilu and Adeoti 2022) converse with Batik's subtle waxresist designs muted tones, and delicate lace hues. Also, there is a contrast in the texture of lace that juxtaposes with the stiffness of Ankara and the softness of Batik, thereby revealing unique textures as they all evoke emotions. Each of these fabrics represents a distinct cultural heritage. The handmade processes connect the fabrics to their original roots, and the patterns and motifs usually narrate stories of tradition and craftsmanship (Irobunor 2022). Therefore, when at least two of the fabrics or the three are combined in one attire, it creates innovative, cross-cultural designs and thereby bring culturally responsible fashion.

## 6. Conclusion

The tempo at which the Nigerians are exploiting the concepts of Ankara, batik, and lace fabrics nowadays is an attestation to the fact that the fabrics' texture is often associated with African cultural heritage and identity. The conspicuous patterns and the richness of the pigments reveal the creativity of the Africa artists. Moreover, the coherent application of textures and the semiotic ideas can invoke a positive attitude towards the use of the three fabrics more than the way people use other contesting fabrics in the Nigerian markets.

The study explored and uncovered the complex relationship between texture, culture and meaning. With the help of qualitative approach, the research revealed the distinct textural characteristics, aesthetics principles and cultural significance of each of the fabrics. It was discovered that Ankara fabrics embody African cultural heritage which symbolizes tradition and cultural identity. Batik fabrics represent Indonesian cultural nuances which conveys spirituality, philosophy and natural harmony. It was also discovered that lace fabrics influence design, garment construction and cultural representation. It then implies that traditional techniques are revived, and eco-friendly practices are promoted. The study has contributed to the field of textile semiotics and provides a comprehensive understanding of the textural relationships of Ankara, Batik and Lace fabrics. It offers valuable insights for designers and cultural enthusiasts, and it promotes cross-cultural understanding and cultural preservation.

#### References

Adeloye, A. A., Akinbogun, T.L, and Ogunduyile, S.R. (2023). The Production of African Print Fabric designs: A User-Centric Design Approach; *Prithvi Academic Journal* (A Peer Reviewed, Open Access Multidisciplinary Journal); DOI: <u>https://doi.org/10.3126/paj.v6il.5404</u>; Volume 6, pp 32-48.

Adeoti, A.A. (2023). Report on Predominant Ankara Fabric Designs in Osun State of South-Western Nigeria: Osogbo as Case Study. *The Polish Journal of the Arts and Culture*. New Series 18; https://doi.org/10.4467/24506249PJ.23.019.19560 (2/2023): 125-136

Adeoti, A.A. and Kalilu, R.O.R. (2024). Design Taxonomy of Ankara Fabrics among the Yoruba of Southwestern Nigeria. *International Journal of Humanities, social sciences, and Management* (IJHSSM); <u>www.ijhssm.org</u>. 4(3): 302-310

Adetona, S. A. and Adiji, B.E. (2023). Adaptation of Sato Drum symbols as Design for fabric Decoration Using Studio. *Nigerian Online journal of Educational Science and Technology* 5(2): 107-129

Aishwariya, S. and Ramyabharathi, B (2023). Lace Through time: Exploring History, Types, Materials Motifs, Innovations, and designing lace for Non-textile Products, Man-made Textiles in India 11:367-372

Ajuonma, S. (2009) "Ankara in all Splendour". The Guardian. Friday, 11th December, 2009 pp 10.

Akinwumi, T. (2021). The "African Prints": Africa and Aesthetics in the Textile World. DOI: 10.1007/978-3-030-60652-7\_8; (pp. 123-140).

Aladesanmi, O.A. (2019) Colonization and cultural values of Yoruba people: A case of traditional drums in Yoruba land. *Journal of Language and Literature*, 19(2).

Ampa-Korsah, H., Adu-Gyamfi, V. and Koranteng, M. (2024). Consequences of Symbolic Names and Meanings of Ghanaian fabric on Consumer Purchase Intention. *Scientific Research Publishing Inc.*, https://www.scirp.ng/journal/adr. Art and Design Review, 2024, 12, 149-164.

Ayesu, S.M., Acquaye, R., Howard, E.F., and Asinyo, B.K. (2023). Promotion and Preservation of Indigenous Textiles and Culture in Ghana. *East African Journal of Education and Social Sciences*. DOI: https://doi.org/10.46606/eajess2023v01.0252. Published by G-Card 4(1): 15-29.

Balas, B. and Greene, M.R. (2023). Texture in Art; *Journal of Vision;* doi:10.m1167/jov.23.143.3; PMID: 38064227.

Bello, Z. and Saleh, R. (2021). Re-Think Design of Lace Pattern and the Northern Knot on Paper. *Article* 2(2): 41-51.

Buckley, G.H. (2009). Lace Fabrics. *Journal of the Textile Institute Proceedings*; Published online on 5 January 2009; <u>https://doi.org/10.1080/19447013408663443</u>; 25(6): 215-224

Daly, O.El. (n.d.). Hieroglyphs Unlocking Ancient Egypt; <u>access@britishmuseum.org</u>; 1855-1808 BC, *Havana limestone British Museum*, EA 1072.

Debeli, D.K., Yuan, L.J., and Zhou, J. (2013). African Textile Design and Fabric Arts as a Source for Contemporary Fashion Trends. 2nd International Conference on Science and Social Research (ICSSR 2013). DOI: 10.2991/icssr-13.2013.50; pp.229-233.

Demilew, F.A. (2019). Ancient Geez Script Recognition Using Deep Convolutional Neural Network. Thesis Submitted to the Graduate School of Applied Sciences of Near East University, for the Award of the Degree of Master of Sciences in Software engineering

Dutkiewicz, E., Russo, G., Lee, S., and Bentz, C. (2020). SignBase, a Collection of Geometric Signs on Mobile Objects in the Paleolithic; *National Library of Medicine*; doi: 10.1038/s41597-020-00704-x

Effiong, S.G. (2015). Exploration and Adaptation of Nsibidi Motifs for Trado-Modern Communication in Nigeria. University of Uyo, Uyo Nigeria. Page 1-17

Etukudo, B.I. (2020). The Origin of Ekpe Masquerade and the Nsibidi Symbols in Southern Nigeria. *Corpus ID*: 245019197

Ghartey, K.E., Bruce-Amartey, E., and Acquaye, R. (2022) Socio-cultural challenges of small and medium scale batik and tie-dye industry in Ghana. *Journal of Textile Science and Technology* 8(3)

Gillow, J. and Dawson, B. (1995) Traditional Indonesian Textiles. Thames and Hudson. ISBN: 0-500-27820-2.

Irobunor, A.M. (2022). Chukwuebuka Obi-Ochendu's Fashion Aesthetics and its Impact on Nigerian Youths. *International Journal of Comparative Studies in International Relations and Development*. DOI: 10.48028/iiprds/ijcsird.v8.il.12; 8(1): 127-137

Jimoh, K.O., Odejobi, O.A., Folaranmi, S.A., and Aina, S. (2020). Handmade Embroidery Pattern Recognition: A New validated Database. *Malaysian Journal of Computing*, eISSN: 2600-8238 online, 5(1): 390-402.

Kalilu, R.O.R. and Adeoti, A.A. (2020). Morphological Categorization and Typological Classification of Lace Fabrics in Nigeria; *Clothing Cultures; Intellect Ltd Article* English Language https://doi.org/10.1386/cc\_00022\_1; 3(6): 351-364

Kalilu, R.O.R., and Adeoti, A.A. (2022). Typology and Fashion Usage Trends of Ankara in the Twenty-First Century South-western Nigeria. *Textile: Cloth and Culture* <u>https://doi.org/10.1080/14759756.2022.2053275;</u> 21(1):235-253

Kodzoman, D., Hladmik, A., Povko-Cuden, A., and Cok Vanja (2023). Assessment and Semantic Categorization of Fbric Visual Texture Preferences; *Antex Research Journal 23*(2); doi: 102478/aut.2022-0006

Kozlowska, W.M. (2023). Ancient Egypt Hieroglyphs-Contemporary Reading for Fresh Ideas in Art. Culture and Arts in the Modern World. ISSN 2616-423Z (Online); DOI: 10.31866/2410-1915.24.2023.287659. Issue 24; pp. 49-64.

Kuwonu, F. 2020. African History Told through Fashionable Printed Clothing. http://www.un.org/africarenewal.com. Uploaded 17th September 2020.

Labode, O.J. and Braide, O.O. (2022). Symbolic Designs of Textile Art in African fabrics; *The Polish Journal of the Arts and Culture*. doi:10.4467/2450624PJ.22.010.16833. New Series 16 (2/2022): 71-86

Lasisi, L.A., Oridola, A.I., and Oligbide, S.R. (2022) Increase in Patronage of printed fabrics "Ankara" as a Wearable Dress for Ceremonial Occasions; *International Journal for Innovative Research in Multidisciplinary Field*, ISSN: 2455-0620 (Impact Factor: 6.719), DOI: 10.25/IJIRMF/202202016. Publication Date: 28/02/20221; 8(2): 87-93

Liu, J., Lugbofer, E., and Xeng, X. (2015). Aesthetic Perception of Visual Textures: a Holistic Exploration Using Texture Analysis, Psychological Experiment, and Perception *Modeling; National Library of Medicine*; doi:10.3389/fncom.2015.0013; PMCID: PMC46318371 PMID: 26582987

Musa, Z.B. (2019). The Impact of Motifs and Patterns on Surface Design in Fashion and Textile Design on People's Emotions. Limkokwing University of Creative Technology, Malaysia; <u>https://www.researchgate.net</u>

Nggusham, Y. (2017) Assessment of the impact of resist technique of fabric decoration on students' interest in clothing and textiles in Borno State, Nigeria. An M.Ed (Clothing and Textiles) Thesis of Ahmadu Bello University, Zaria.

Nnewuihe, I. (2020). The Fascinating History of Ankara Fabric (African Wax Print) in the West Africa). *Mbili Journal* (Online)

Nwosu, M. (2010). In the name of the Sign: the Nsibidi as the Language and Literature of the crossroads. *Journal of Semiotica;* https://doi.org/10.1515/semi.2010.061

Odulate, F. (2009) "Nigerian Ankara". British Vogue pp 6

Okpu, O. (2015). Nsibidi: An Artistic Exploration and Communicative System in South Eastern Nigeria. Art and Design Studies. ISSN: 2224-6061 (Paper) ISSN: 2225-059 (Online), Volume 29 pp. 88-94

Olanrewaju, O. (2020). "History and Fashion Features of Ankara." Accessed on August 23, 2022. www.ukessays.com

Oyairo, M. 2020. A Brief History of Ankara Fabric and African Prints. www.oludan.com. Assessed on 2nd November 2023.

Oyedele, O.M. and Obisesan, B. (2013). The Resurgence of Ankara Materials in Nigeria; Journal of Education and Practice; ISSN 2222-1735 (Paper) ISSN 2222-2888x (Online); Volume 4, No 17, pp 166-170.

Plankensteiner, B. (2013), 'African lace: An industrial fabric connecting Austria and Nigeria, *Anthrovision: Vaneasa Online Journal*, 1:2, https://doi.org/10.4000/anthrovision.679.

Raffles, T.S. (1817) History of Java. Black, Parbery and Allen. London

Richard, M. (2020). Semiotics Definitions and Examples

Riera, J.J. (2020). Semiotic Theory, https://opentext.wsu.edu

Sauvet, G., Bourrillon, R., Garat, D., Petrognani, S., Rivero, O., Robert, E., and Tosello, G. (2018). The Function of Graphic Signs in the Prehistoric Societies: The case of Catabrian Signs; *Quaternary International;* <u>https://10.1016/j.quaint.2017.01.039</u>; Volume 491, pp. 99-109.

Shaw, I. (2004). Writing: the Origins and Implications of Hieroglyphs. Oxford Academic; https://doi.org/10.1093/actrade/9780192854193.003004

Simisiri, S. (2019) Comparison of effective in batik production process between paraffin wax and gel-wax resist. *International Journal of Chemical Engineering and Applications* 10(4):101-105.

Sunberg, B. (2008) "Wearing Wax". Lecture at the Seattle Art Musuem, Seattle, WA.

Willard, M. (2004). History of Research on African Factory-Printed Cloth and Current Approaches in the field. *Textile Society of America Symposium Proceedings*; https//digitalcommons.uni.edu/tsaconf/447; pp. 174-182

Yakar, J. (2016) Symbols and Abstract Motifs in Neolithic Art: More than just Fanciful Aesthetic Designs? Pages 165-178; https://www.researchgate.net/publication/313025507

Yuian, L., Liu, M., Liu, J., Yang, Y., and Gong, X. (2022). Texture Representation and Application of Coloured Spun Fabric Using Uniform Three-structure Descriptor. *AUTEX Research Journal*. DOI: 10.2478/aut-2021-0039; 22(4): 1-11